

SPECIFICATIONS

FOR THE

LOCKPORT RAW WATER PUMP STATION IMPROVEMENTS 522 River Road, North Tonawanda, NY 14120

GENERAL CONTRACT
HVAC CONTRACT
ELECTRICAL CONTRACT

CITY OF LOCKPORT
NIAGARA COUNTY, NEW YORK

MAYOR

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21J1-0119

NOTICE TO CONTRACTORS

CITY CLERK'S OFFICE
LOCKPORT, NEW YORK

LOCKPORT RAW WATER PUMP STATION IMPROVEMENTS

Sealed proposals shall be received by the undersigned at Lockport Municipal Building, One Locks Plaza, Lockport, New York, until **2:00 P.M. on August 9, 2024** at which time and place they will be publicly opened and read for the **Lockport Raw Water Pump Station Improvements** in accordance with the Plans and Specifications obtainable as described below.

Effective July 19, 2024, Bid Documents can be ordered through the following web site: www.buffalocopyplanroom.com/jobs/public. If you do not have internet access or have questions on ordering from the site, please contact The Copy Store at 716-847-6400. Bid Documents can be picked up at The Copy Store at 49 Court Street, Buffalo, New York 14202, upon a non-refundable fee per set. Payment can be submitted by credit card or company check/money order made payable to The Copy Store. Bidders must be registered with The Copy Store as having obtained a complete set of Bidding Documents. Bids submitted on copies of Bidding Documents from other sources will not be accepted.

Bidding Documents will be shipped from The Copy Store upon request and upon receipt of an additional non-refundable shipping charge made payable to The Copy Store.

Each proposal must be accompanied by a Bid Bond or a Certified Check in the amount of Ten Percent (10%) of the bid price.

The Common Council of the City of Lockport, New York, reserves the right to reject any or all proposals, to consider the reputation and experience of the Bidder in making its selection; to waive any informalities or minor deviations from the specifications; and to award the contract to other than the lowest bidder, if for good and sufficient reasons, it is considered in the best interest of the City of Lockport, to do so.

An optional pre-bid meeting will be held at 9:00 am EST on July 25, 2024 at the Raw Water Pump Station, 522 River Road, North Tonawanda, NY 14120. Attendance at the pre-bid meeting is recommended but not mandatory.

Sarah K. Lanzo
City Clerk

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TECHNICAL SPECIFICATIONS

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DIVISION 05 – METALS

051200 Structural Steel Framing

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083323 Overhead Coiling Door

DIVISION 23 - HVAC

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DIVISION 31 - EARTHWORK

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APPENDICES

Appendix A Pre-Purchased Generator and Transfer Switches

LIST OF DRAWINGS

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2	S-101	Structural Plan
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4	M-001	Mechanical Notes, Schedules, and Details
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8	E-002	Electrical Conduit, Communication and Lighting Schedule
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11	ED102	Electrical First Floor Lighting Demolition Plan
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INFORMATION FOR BIDDERS

1. BIDS

- (1) Bids must be submitted on the prescribed forms that are attached hereto.
- (2) All blank spaces in the Bid for lump sum bidding or unit prices and extended totals thereof, must be filled in, and except as otherwise expressly provided in the Bidding Documents, no change is to be made in the phraseology of the Bid or in the items mentioned therein.
- (3) Bids that are illegible or that contain omissions, alteration, additions, or items not called for in the Bidding Documents, may be rejected as informal. In the event any Bidder modifies, limits or restricts all or any part of his Bid in a manner other than that expressly provided for in the Bidding Document, his Bid will be rejected as informal.
- (4) Any Bid may be considered informal which does not contain prices in words and figures in all of the spaces provided, or which is not accompanied by bid security in proper form. In case any price shown in words and its equivalent shown in figures do not agree, the written words may, at the discretion of the Engineer, be considered binding. If unit prices are required and there is a discrepancy in the unit prices and extended totals, the unit prices shall be binding upon the Bidder.
- (5) If the Bid is made by a corporation, the names and places of residence of the President, Secretary and Treasurer shall be given. If by a partnership, the names and places of residence of the partners shall be given. If by a joint venture, the names and addresses of the members of the joint venture. If by an individual, his name and place of residence shall be given.
- (6) Permission will not be given to modify, explain, withdraw, or cancel any Bid or part thereof after the time designated in the Bidding and Contract Documents for the opening of bids.

2. EXAMINATION OF BIDDING CONTRACT DOCUMENTS AND SITE

- (1) Prospective Bidders shall examine the Bidding and Contract Documents carefully, and before bidding, may make a request which shall be in writing to the City, for an interpretation or correction of any ambiguity, inconsistency or error, therein, which should be discovered by a reasonably prudent Bidder. Such interpretation or correction as well as any additional contract provisions the City shall decide to include, will be issued in writing by the Engineer as an addendum, which will be sent by certified mail or delivered to each person recorded as having received a copy of the Bidding and Contract Documents, not later than three (3) days prior to the date specified for the opening of the bids, and which also will be available at the places where the Bidding and Contract Documents are available for inspection by prospective Bidders. Upon such mailing or delivery and making available for inspection, such addendum will become part of the Bidding and Contract Documents, and will be binding on all Bidders, whether or not the Bidder receives or acknowledges the actual notice of it. The requirements contained in all Bidding and Contract Documents shall apply to all addenda.
- (2) Only the written interpretation or correction so given by addendum shall be binding. Prospective Bidders are warned that no officer, agent, or employee of the City is authorized to explain or interpret the Bidding and Contract Documents by any other method, and any such explanation or interpretation, if given, must not be relied upon.
- (3) The attention of persons intending to make proposals is specifically called to that paragraph wherein the Bidder agrees that he has examined the Contract Documents and the site of the work, and has fully

informed himself from his location, and other conditions affecting the work to be performed, including the existence of poles, wires, pipes and other facilities and structures of municipal and other public service corporations, on, over or under the site, and that he will make no claim against the City by reliance upon any estimates, tests or other representations made by any officer or agent of the City with respect to the work to be performed under the Contract. Particular attention is called to the proposal forms which may contain special notes and special specifications at variance with standard plans and specifications.

Whenever subsurface borings or other subsurface information obtained by the City is available for a Bidder's inspection, it is understood that it has been obtained with reasonable care and recorded in good faith with reasonable interpretation placed on the results and character of materials and conditions to be expected. The Bidder must interpret this information according to his own judgment, and not rely upon it as accurately descriptive of subsurface conditions, which may be found to exist. The information is made available to the Bidder only in order that the Bidder may have access to the identical information available to the City.

3. COMPUTATION OF BID

- (1) In computing their bids, Bidders are not to include the sales and compensating use taxes of the State of New York, or any City and County in the State of New York, for any supplies or materials to be sold to the City pursuant to the provisions of Section 10 of the Information to Bidders which are exempt from such taxes in accordance with the provisions of Section 10 of Information for Bidders.

4. PAYMENT OF SECURITY

- (1) Each proposal must be accompanied by a Bid Bond or a Certified Check, in the amount of Ten Percent (10%) of the bid price.

5. QUALIFICATIONS OF BIDDERS

- (1) Each Bidder shall upon request of the City, submit on the form furnished by the City, a statement of the Bidder's qualifications, his experience record in constructing the type of improvements embraced in the work, and his organization and equipment available for the work contemplated; and when specifically requested, to take such steps as it deems necessary to determine the ability of the Bidder to perform his obligations under the contract, and the Bidder shall furnish the City all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available evidence or information does not satisfy the City that the Bidder is qualified to carry out properly the terms of the Contract.
- (2) The City reserves the right to consider as unqualified to do the work of general construction, any Bidder who does not habitually perform with his own forces the major portions of the work involved in construction of the improvements embraced in this Contract.
- (3) A Bidder must also be prepared, if required by the City, to prove to the satisfaction of the City that he has successfully completed a contract of similar work in an amount of not less than 75% of the amount of his total bid.

6. AWARD OF CONTRACT

- (1) The award of the Contract shall be made to the lowest Bidder who, in the opinion of the City, is qualified to perform the work required and is responsible and reliable. The lowest bid shall be determined by the City on the basis of the gross sum for which the entire work will be performed, arrived at by a correct computation of all the items specified in the bid, therefore, at the lump sum and/or unit price, if any, contained in the bid. When alternate bid items are required in the bid, the City reserves the right to select any alternate or combination of alternates and the contract will be awarded to that responsible Bidder whose bid for the alternate or combination of alternates, selected by the City is the lowest.
- (2) Subject to the right hereinafter reserved, the work will be awarded within forty-five (45) Calendar days after the opening of bids to a single responsible Bidder, or any combination of Bidders whose bid conforms to the requirements of the Bidding Documents.
- (3) The right is reserved, as the interest of the City may require, to reject any bid or all bids and to waive any informality in any bid received. Without limiting the generality of the foregoing:
 - (a) A bid may be rejected if the Bidder failed to furnish the required bid security in the amount of 10% of the bid.
 - (b) A bid may be rejected if the Bidder cannot show to the satisfaction of the City: (1) that he has the necessary capital, skill and experience; or (2) that he owns, controls or can procure the necessary plant and equipment to commence the work at the time prescribed in the Contract, and thereafter to execute and complete the work at the rate, or within the time, specified; (3) that he is not already obligated by the performance of so much other work as likely to delay the commencement, prosecution, or completion of the work contemplated by the Contract.
- (4) The City also expressly reserves the right to reject any bid, if in its opinion, considering the work to be performed, the facts as to the Bidder's business or technical organization, plant, financial and other sources or business experience compared with the work bid upon, justify rejection.
- (5) The award of the Contract shall not be construed as a guarantee by the City that the plant, equipment and the general scheme of operations and other data submitted by the Bidder with or after his bid is either adequate or suitable for the satisfactory performance of the work.

7. REQUIRED BONDS

- (1) The Bidder whose proposal has been accepted will be required to appear at the place and at the time designated by the City, in person; or if a firm or corporation, a legally authorized representative shall so appear, and shall execute the contract within ten (10) calendar days of date of notice of award of contract.
- (2) In addition, the successful Bidder, within the period stipulated in paragraph (1) above, shall procure, execute and deliver to the City and maintain, at his own cost and expense, the following bonds of a surety company approved by the City and authorized to do business in the State of New York as a surety;
 - (a) Performance Bond - in an amount not less than 100% of the total amount payable to the Contractor by the terms of the Contract.
 - (b) Labor and Material Bond - in an amount not less than 100% of the total amount payable to the Contractor by the terms of the Contract.

- (3) Failure or refusal of the Bidder whose proposal is accepted to execute the Contract as hereinbefore provided, shall constitute a breach by such Bidder or the Agreement created by the acceptance of the Proposal, and in such event, the City at its option, may determine that such Bidder has abandoned the Contract. Thereupon such Bidder's Proposal and the City acceptance thereof, shall be null and void, and the City shall be entitled to take action for damages. Such damages shall include the amount of the total contract finally accepted in excess of that of the originally successful Bidder, losses arising from delays in the City's construction program, and all other items of cost to the City resulting from such breach. In the recovery of the damages specified above, the City may proceed against the sum presented by the Bid Guaranty deposited with him, or take such action as the City may deem best in the public interest.

8. ASSIGNMENT

The successful Bidder to whom any Contract shall be let, granted or awarded, shall not assign, transfer, convey, sublet or otherwise dispose of the Contract or of his right, title or interest therein or his power to execute such Contract, to any person or corporation without the prior consent in writing of the City.

9. LABOR LAW

Attention is also directed to the fact that the Contractor will be governed by Section 220 of the Labor law as amended, relating to hours of labor and prevailing rate of wage; also Section 220-A, 220-B, 220-C, 220-D, and 220-E of the Labor Law as amended in relation to the payment of wages earned by employees upon public works.

Attention is also directed to the fact that the Contractor will be governed by the contract agreement and Section 222 of the Labor Law as amended, relating to the preference in employment of citizens of the State of New York who have been residents for at least six consecutive months immediately prior to the commencement of their employment. Each person so employed shall furnish satisfactory proof of residence in accordance with rule adopted by the Industrial Commissioner, and that each Contractor and Sub-Contractor shall keep a list of his employees, stating whether they are citizens of the State of New York, native born citizens or naturalized, and in case of naturalization, the date thereof and the name of the court in which granted, in the construction of public works.

During the performance of this contract, the Contractor agrees as follows:

- (1) The Contractor will not discriminate against any employee or application for employment because of race, sex, creed, color or national origin, and will take affirmative action to insure that they are afforded equal employment opportunities without discrimination because of race, sex, creed, color or national origin; such action shall be taken with reference, but not be limited to: recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on-the-job training.
- (2) The Contractor will send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the State Commission for Human Rights, advising such labor union or representative of the Contractor's agreement under clauses (1) through (7) (hereinafter called "non-discrimination clauses"). If the Contractor was directed to do so by the contracting agency as part of the bid or negotiation of this contract, the Contractor shall request such labor union or representative to furnish him with a written statement that such labor union or representative will not discriminate because of race, sex, creed, color or national origin, and that such labor union or representative either will affirmatively cooperate, within the limits of its legal and contractual authority, in the implementation of the policy and

provisions of these non-discrimination clauses or that it consents and agrees that recruitment, employment and the terms and conditions of employment under this contract, shall be in accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the contractor shall promptly notify the State Commission for Human Rights of such failure or refusal.

- (3) The Contractor will post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Commission for Human Rights, setting forth the substances of the provisions of clauses (1) and (2) and such provisions of the State's laws against discrimination as the State Commission for Human Rights shall determine.
- (4) The Contractor will state, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, sex, creed, color or national origin.
- (5) The Contractor will comply with the provisions of Sections 291-299 of the Executive Law and the Civil Rights Law, will furnish information and reports deemed necessary by the State Commission for Human Rights under these non-discrimination clauses and such sections of the Executive Law, and will permit access to his books, records and accounts by the State Commission for Human Rights, the Attorney General and the Industrial Commission for purposes of investigation to ascertain compliance with these non-discrimination clauses, and such sections of the Executive Law and Civil Rights Law.
- (6) This contract may be forthwith cancelled, terminated or suspended in whole or in part, by the contracting agency upon the basis of a finding made by the State Commission for Human Rights that the Contractor has not complied with these non-discrimination clauses, and the Contractor may be declared ineligible for future contracts made by or on behalf of the State or a public authority or agency of the State until he satisfies the State Commission for Human Rights that he has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such findings shall be made by the State Commission for Human Rights after conciliation efforts by the Commission have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Commission, notice thereof has been given to the Contractor and an opportunity has been afforded him to be heard publicly before three members of the Commission. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided by law.
- (7) The Contractor will include the provisions of clauses (1) through (6) in every subcontract purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to operations to be performed within the State of New York. The Contractor will take such action in enforcing such provisions of such subcontract, or purchase order as the contracting agency may direct, including sanctions or remedies for non-compliance. If the Contractor becomes involved in or is threatened with litigation with a sub-contractor or vendor as a result of such direction by the contracting agency, the Contractor shall promptly so notify the Attorney General, requesting him to intervene and protect the interests of the State of New York.

10. STATE AND LOCAL SALES TAX EXEMPTION

The Contractor's attention is directed to the changes made in Section 1115 of the Tax Law by Chapters 513 and 514 of the Laws of 1974. In connection with capital improvements contracts entered into on or after September 1, 1974, all tangible personal property which will become integral component of a structure, building or real property of the City, is exempt from State and Local Retail Sales Tax and Compensating Use Tax.

11. STATEMENT OF NON-COLLUSION

- (1) (a) By submission of this bid, each Bidder and each person signing on behalf of any Bidder, certifies and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty or perjury, that to the best of his knowledge and belief:
 - (1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other Bidder or with any competitor:
 - (2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to the opening, directly or indirectly, to any other Bidder or to any competitor; and
 - (3) No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- (b) A bid shall not be considered for award nor shall any award be made where (a) (1) (2) and (3) above have not been complied with; provided, however, that if any case the Bidder cannot make the foregoing certification the Bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where (a) (1) (2) and (3) above have not been complied with, the bid shall not be considered for awarded, nor shall any award be made unless the head of the purchasing unit of the State, public department, or agency to which the bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition. The fact that a Bidder (a) has published price lists, rates, or tariffs covering items being procured, (b) has informed prospective customers or proposed or pending publications of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being bid, does not constitute, without more, a disclosure within the meaning of subparagraph (1) (a).
- (2) Any bid hereafter made to the Municipality, agency or official thereof by a Corporate Bidder for the work or services performed or to be performed or goods sold or to be sold, where competitive bidding is required by statute, rule or regulation, and where such bid contains the certification referred to in subdivision (1) of this section, shall be deemed to have been authorized by the Board of Directors of the Bidder, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of the reference as to non-collusion, as the act and deed of the corporation.

13. WITHDRAWAL OF PROPOSALS

Negligence on the part of the Bidder in preparing his proposal, confers no right for withdrawal of the proposal after it has been opened. Any Bidder upon his properly notarized written request, will be given permission to withdraw his proposal not later than the time set for opening. At this time of opening of the proposals, when such proposal is included, it will be returned to the Bidder, unopened.

14. WAIVER OF IMMUNITY CLAUSE

The Bidder hereby agrees to the provisions of Sections 139-A and 139-B of the New York State Finance Law, which requires that upon the refusal of a person, when called before a grand jury to testify concerning any transaction or contract made with the State, any political subdivision thereof, a public authority or with any public department, agency or official of the State to sign a Waiver of Immunity, against subsequent criminal

prosecution or to answer any relevant question concerning such transaction or contract.

- (1) Such person and any firm, partnership or corporation of which he is a member, partner, director or officer shall be disqualified from thereafter selling to or submitting bids to or receiving awards from or entering into any contracts with new York State or any public department, agency or official thereof, for goods, works or services, for a period of five (5) years after such refusal, and
- (2) Any and all contracts made with the State of New York or any public department, agency or official thereof, since the effective date of this law, by such person any by any firm, partnership or corporation of which he is a member, partner, director or officer, may be cancelled or terminated by New York State without incurring any penalty or damages on account of such cancellation or termination, but any monies owed by the State of New York for goods delivered or work done prior to the cancellation or termination may be paid.

15. SPECIFIC CONTRACT CONDITIONS

Refer to “Specific Contract Conditions” located in Bidding and General Requirements for information regarding specific funding requirements.

End of Information For Bidders

SPECIFICATIONS

GENERAL CONDITIONS

DEFINITIONS

1. MARGINAL NOTES, ETC. - Title headlines, running headlines, and marginal notes are printed hereon merely for convenience and shall not be deemed to be any part of this Contract for any purpose whatsoever.

Whenever the following words and expressions are used in these specifications, it is understood that they have the meaning defined below.

CONTRACTOR - The person or persons or corporation performing the Contract.

CITY - The City of Lockport.

COMMON COUNCIL - The Common Council of the City of Lockport.

ENGINEER - A representative of the City of Lockport Engineering Department.

CALENDAR DAY - Every day shown on the calendar.

CONTRACT DOCUMENTS - All Plans, Bidding Sheets, Shop Drawings (upon final approval), clarification or revision drawings and all specifications, including Proposal, Agreement, Performance Bonds, Insurance's, Technical Specifications, Addenda, Easements, and other permits, codes and regulations governing the work directly or indirectly in whatever manner, together with all provisions required by Law, whether inserted in the Specifications or not.

SUPERVISION - Shall mean inspection of work, Engineering during construction, field and office work necessary to keep the City informed and protected, and to permit the Contractor to proceed with the work within the terms of the Contract Documents. It shall not in any way mean, imply or indicate either directly or indirectly, any responsibility on the part of the City and/or Engineers for determination and/or direction of the methods employed in the progress of the work which shall remain the sole responsibility of the Contractor, except where such methods would contravene the intent of the Contract Documents. In such case, the City and/or Engineers may employ sanctions as provided in the Contract Documents, without prejudice to the contract in any way.

DATE OF FINAL ACCEPTANCE - Shall be that date upon which final payment shall be approved. Such date will also be the date on which the period of various guarantees shall commence.

WORK - The term "WORK" is used to designate the work, equipment, materials and things required to be done, furnished, or performed by the Contractor, under the Specifications attached hereto.

2. SPECIFICATIONS - The following directions, requirements, etc, together with all agreements made or to be made pertaining to the method of performing the work and the quantity and quality of the materials.

CONTRACT AGREEMENT - The agreement covering the performance of the work and the furnishing of labor and materials in the construction of the work. The Contract Documents shall include the advertisement for proposals; the Contractor's proposal; the Agreement; Specifications; the Plans, and Addenda to specifications, and all provisions required by law to be inserted in the Contract, whether actually inserted or not.

MATERIALS AND METHODS - All materials and methods used in the various parts of this project shall meet the New York State Department of Transportation Standard Specifications of January 2, 1995, or latest addendum, which are hereby incorporated by reference, except as modified by Specifications.

TON - Short ton of 2,000 pounds.

STREET - That strip of land reserved for the traveling public and bounded by the property lines of adjacent owners.

3. SILENCE OF SPECIFICATIONS - The apparent silence of specifications as to any details of the apparent omission of a detailed description concerning any work to be done or materials to be furnished, shall be regarded as meaning that only the best standard practice is to prevail, and that only material and workmanship of first quality is to be used in this connection, and all interpretations of these specifications shall be made on this basis.
4. ACCURACY OF PLANS AND SPECIFICATIONS - The detail plans and specifications for the Contract have been prepared with care and are intended to show as clearly as is practicable, the work required to be done. The Contractor must realize, however, that construction details cannot always be accurately anticipated, and that in executing the work, field conditions may require reasonable minor modifications in the details of plans and quantities of work involved. Work under all items in the Contract, must be carried out to meet these field conditions to the satisfaction of the Engineer, and in accordance with these instructions and the Contract specifications.
5. LINES AND GRADES - The Engineer will set suitable stakes and marks showing the locations and elevations of the various parts of the work, but the Contractor shall provide such stakes and labor and shall be undertaken until such stakes and labor and assistance as the Engineer may require in setting the same. No work shall be undertaken until such stakes and marks shall have been set by the Engineer. The Contractor shall take due and proper precautions for the preservation of these stakes and marks, and shall see to it that the work at all times proceeds in accordance therewith. The Contractor shall brush out survey lines as directed by the Engineer in advance of all survey work, in order to permit accurate and unimpeded work by the survey parties.
6. SITE INVESTIGATION - The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, ground water table or similar physical conditions at the site, the conformation and condition of the ground, the character, quality and quantity of surface and subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all the available information concerning these conditions, will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work.
7. BORINGS AND SUBSURFACE DATA - The Contractor may examine the logs of soundings, borings, rock cores and other sub-surface data, if available, by making a request therefore to the Engineer. Such data is offered in good faith solely for the purpose of placing the Contractor in receipt of all information available, and in no event is to be considered a part of the Contract Documents. The Contractor must interpret such data according to his own judgment and acknowledges that he is not relying upon the same as accurately describing the sub-surface conditions which may be found to exist. The Contractor further acknowledges that he assumes all risk contingent upon the nature of the sub-surface conditions to be actually encountered by him in performing the work covered by the Contract, even though such actual conditions may result in the Contractor performing more or less work than he originally anticipated.

8. ALTERATIONS AND OMISSIONS - The said work shall be performed in accordance with the true intent and meaning of the Contract Documents without any further expense of any nature whatsoever to the City other than the consideration named in this agreement.

The City reserves the right, at any time during the progress of the work, to alter the plans or omit any portion of the work, as it may deem reasonably necessary for the public interest; making allowances for additions and deductions at the prices named in the proposal for this work without constituting grounds for any claim by the Contractor for allowance for damages, or for loss of anticipated profits, or for any variations between the approximate quantities and the quality of the work as done.

9. DAMAGES TO WORK - The Contractor further agrees that all damages of whatever nature resulting from the work or resulting to the work during its progress from whatever cause, shall be borne and sustained by him and that all the work shall be solely at his risk, until it has been finally inspected and accepted by the City.
10. PATENTED DEVICES, MATERIAL AND PROCESSES - It is mutually understood and agreed that the Contract prices are to include all royalties and costs arising from patents, trademarks and copyrights in any way involved in the work. Whenever the Contractor is required or desires to use any design, device, material or process covered by letters, patent or copyright, the Contractor shall indemnify and save harmless the City from any and all claims for infringement by reason of the use of any such patented design, device, material or process to be performed under the Contract, and shall indemnify the said City for any cost, expenses and damages which it may be obliged to pay by reason of any such infringement, at any time during the execution or after the completion of the work.
11. EQUIVALENT MATERIALS AND EQUIPMENT - Whenever in any of the Contract Documents, an article, material or equipment is defined by describing a proprietary product, or by using the name of a manufacturer or vendor, the term "or approved equal", if not inserted, shall be implied. The specific article, material or equipment mentioned shall be understood as indicating the type, function, minimum standard of design efficiency and quality desired, and shall not be construed in such a manner as to exclude manufacturers' products of comparable quality, design and efficiency.

Other manufacturers' products will be accepted provided sufficient information is submitted to the Engineer to determine that the products proposed are equivalent to those named.

Whenever material or equipment is submitted for approval as being equal to that specified, the Engineer shall make the decision as to whether or not such material or equipment is equal to that specified.

Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Contract, the Contractor shall immediately proceed to furnish the designated material or equipment.

Neither the approval by the Engineer of alternate material or equipment as being equivalent to that specified, nor the furnishing of the material or equipment specified, shall in any way relieve the Contractor of responsibility for failure of the material or equipment, due to faulty design, material, or workmanship, to perform the functions required of them by the Specifications.

12. STANDARD SPECIFICATIONS -

- (a) Whenever reference is made to any published standards, codes or standard specifications, it shall mean the latest standard code, specification or tentative specification of the technical society, organization or body referred to, which is in effect at the date of invitation for bids. Where specified articles, sections, paragraphs or other subdivisions of the referenced publications are not stated, the referenced publication shall apply in full.

- (b) The following is a partial list of typical abbreviations which may be used in the specifications, and the organizations to which they refer:

AAN	American Association of Nurserymen
AAR	Association of American Railroads
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway & Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
AOAC	Association of Official Agricultural Chemists
API	American Petroleum Institute
ARA	American Railway Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASLA	American Society of Landscaping Architects
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWPA	American Wood-Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
Fed. Spec.	Federal Specifications
FHWA	The Federal Highway Administration
FSS	Federal Specifications and Standards, General Services Administration
MUTCD	Manual of Uniform Traffic Control Devices
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NYSDOT	New York State Department of Transportation
SAE	Society of Automotive Engineers
SPN	Standardized Plant Names adopted by the American Joint Committee on Horticultural Nomenclature and in effect on the date of advertisement of bids.
USASI	United States of American Standards Institute

12.1 SUBMITTAL PROCEDURES

- A. Coordination: The contractor shall coordinate the preparation and processing of submittals with performance of construction activities. The contractor shall transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
1. The contractor shall coordinate each submittal with fabrication, testing, delivery, other submittals and related activities that require sequential activity.
 2. The contractor shall coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- B. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
1. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals, or if required specifically by the Specifications. The Engineer will promptly advise the contractor when a submittal being processed must be delayed for coordination.
 2. If an intermediate submittal is necessary, process the same as the initial submittal.
 3. Allow two weeks for reprocessing each submittal.
 4. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.
- C. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space about 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 2. Include the following information on the label:
 - a. Project name
 - b. Date
 - c. Name and address of Engineer.
 - d. Name and address of contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate Specification Section
 - i. Drawing number and Detail references, as appropriate.
- D. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

12.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type contractor's construction schedule. Submit within 30 days of Notice to Proceed.

12.3 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
1. Dimensions.
 2. Identifications of products and materials included.
 3. Compliance with specific standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
 6. Sheet size: Except for templates, patterns and similar full-size drawings, submit Shop drawings on sheets at least 8½" x 11" but no larger than 36" x 48".
 7. Submittal: Submit one correctable translucent reproducible print, four blue or black line prints for the Engineer's review.
 8. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

12.4 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings".
1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacture's printed recommendations.
 - b. Compliance with recognized trade association standard.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 3. Submittals: Submit 5 copies of each required submittal: submit 2 additional copies where required for maintenance manual.
 4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until an applicable copy of Product Data applicable is in installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

12.5 ENGINEER'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly.
1. Compliance with specified characteristics is the contractor's responsibility.

13. ERRORS AND DISCREPANCIES

- (a) Should any error, discrepancy or inconsistency appear or occur in drawings or specifications or in work performed by other contractors employed by the City, the Contractor before proceeding with the work, shall notify the Engineer for proper adjustment, and in no case shall he proceed with the work until advised by the Engineer. The drawings are intended to agree with the specifications. Should any discrepancies arise between them, the Contractor shall request clarification from the Engineer, and any determinations made by the Engineer in this connection shall be final and conclusive. Where work is shown diagrammatically on the drawings, the Contractor shall be responsible for the proper arrangement and coordination of the work to avoid interference with adjacent work.

14. ENGINEER'S DECISIONS - The Engineer will, within a reasonable time after presentation to him, make decisions in writing on all matters relating to the interpretation of the Contract Documents.

15. SUPERINTENDENCE - The Contractor shall keep on the work during its progress, a competent Superintendent and any necessary assistants, all satisfactory to the Engineer. The Superintendent shall not be changed except with the consent of the Engineer, unless the Superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The Superintendent shall represent the Contractor in his absence, and all directions given to him, verbally or otherwise, shall be as binding as if given to the Contractor. The Engineer will confirm important oral directions to the Contractor in writing. Other oral directions will be so confirmed on written request of the Contractor. The Contractor shall give efficient supervision to the work

using his best skill and attention. The Engineer shall not be responsible for the acts or omissions of the Superintendent or his assistant.

16. OBSERVATION OF WORK - If the specifications, the Engineer's instructions, laws or ordinances, or any public authority requires any work to be specially tested or approved; the Contractor shall give the Engineer timely notice of its readiness for observation, and if the observation is by an authority other than the Engineer, of the date fixed for such observation. If any work should be covered up without approval or consent of the Engineer, it shall, if required by the Engineer, be uncovered for examination and properly restored at the Contractor's expense.

At any time during the progress of the work, and up to the date of final acceptance, the Engineer shall have the right to reject any work, which does not conform to the requirements of the Contract Documents, even though such work has been previously inspected and paid for. Any omissions or failure on the part of the Engineer to disapprove or reject any work or materials at the time of inspection shall not be construed as an acceptance of any defective work or materials. If any work or materials shall be condemned by the Engineer as defective or improperly done, such work shall be removed and replaced, or the defects otherwise remedied in a manner satisfactory to the Engineer, and consistent with the intent of the Contract.

17. BARRICADES, WARNING SIGNS AND LIGHTS

- (a) The Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights along all areas accessible to the public, as required to insure safety to the public.
- (b) In addition, the Contractor shall provide and maintain such other warning signs and barricades in other areas as may be required for the safety of those employed in the work or visiting site.
- (c) The Contractor shall provide and pay for necessary watchmen and others as required to protect work and materials, and as required to permit the safe operation of pedestrian and vehicular traffic at all times.
- (d) The Contractor shall not restrict access to any private road, driveway by open trenches, or the storage of materials or excavated material. The Contractor shall provide and maintain suitable temporary crossings over open ditches at all private roads and driveways.

18. MAINTENANCE OF TRAFFIC -During the progress of the work, the Contractor shall accommodate both vehicular and pedestrian traffic as provided in these specifications and as indicated on the drawings. In the absence of specific requirements, he shall maintain such traffic. Access to fire hydrants, water and gas valves shall always be maintained. The Contractor's truck and equipment operations on public streets shall be governed by all local traffic ordinances and regulations of the Fire and Police Department, the Department of Public Works, Department of Parking and Traffic, and the New York State Department of Transportation, when applicable.

Small street openings necessary for manholes, alignment holes, sewer connections, etc., will be permitted. Such holes shall not be open longer than necessary and shall be protected in accordance with the requirements of the local Department of Public Works, Department of Parking and Traffic, and the New York State Department of Transportation, when applicable, and any traffic detouring necessary shall be done to the satisfaction of the Departments. Openings shall be covered with steel plates at pavement level secured in place at times that work is not being performed.

Detouring of traffic shall be done in accordance with the requirements of local Department of Public Works, Department of Parking and Traffic and the New York State Department of Transportation, when applicable.

Where streets are partially obstructed, the Contractor shall place and maintain temporary driveways, ramps, bridges and crossings which in the opinion of the Engineer, are necessary to accommodate the public. In the event of the Contractor's failure to comply with the foregoing provisions, the Owner may, with or without notice, cause the same to be done and deduct the cost of such work from any monies due or to become due the Contractor, under this Contract, but the performance of such work by the Owner, or at his insistence, shall serve in no way to release the Contractor from his liability for the safety of the traveling public.

The Contractor shall provide flagmen, warning lights, signs and barricades necessary to direct and protect vehicular and pedestrian traffic.

The Contractor shall inform the local Fire and Police Departments in advance of his program of street obstruction and detours, so that the Fire and Police Department can set up plans for servicing the area in case of any emergency. He shall, also, notify the Department of Public Works, and the New York State Department of Transportation, when applicable, at least one week prior to obstructing any street and obtain necessary permits.

19. TIME OF COMPLETION

- (a) The work to be completed under this Contract shall be commenced within ten (10) days after the date of Notice to Proceed.
- (b) The entire work shall be completed within 350 (three hundred fifty) calendar days from the date of commencement of said work.
- (c) Failure to complete the work within the time stipulated in this Article, including extensions granted thereto as determined by the City, shall entitle the City to deduct from the monies due, or about to become due to the Contractor, an amount equal to \$500 (five hundred dollars), for each calendar day of delay in the completion of the work, said sum being fixed and agreed as Liquidated Damages which the City will suffer by reason of such delay and not as a penalty.

20. PROGRESS PAYMENTS - On or before the last calendar day of the month, the Contractor shall submit a progress payment request, together with supporting data and computations, as are deemed necessary by the Engineer, to determine the accuracy of the request. Failure of the Contractor to submit a request, or lack of complete and accurate supporting data, shall be sufficient reason for withholding payment until such omissions or errors are corrected.

Payment requests may, at the discretion of the Engineer, include a payment of material or equipment not incorporated in the work, but delivered and suitably stored at or near the site. Payment requests for materials or equipment shall be accompanied by such supporting data, satisfactory to the Engineer, as will establish the City's title to the material and equipment, and protect the City's interest therein, including applicable insurance.

The Contractor shall have the full continuing responsibility to install such materials and equipment, protect them from fire, theft, vandalism, the effects of the elements, and any other damage whatsoever; and forthwith repair, replace and make good any damage thereto without cost to the City until such time as the work covered by the Contract is fully accepted by the City. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract. In the event that after title has passed to the City, any of such materials or equipment are rejected as being defective or otherwise unsatisfactory, title to all such materials and equipment shall be deemed to have been transferred back to the Contractor.

The request for payment shall be submitted on a form supplied by the Engineer, and must show the total value of work completed to date of request.

On the basis of an approved progress payment request, the City will, not later than the 45th calendar day after submittal make a progress payment to the Contractor. To insure proper performance of the Contract, the City shall retain five percent (5%) of the amount of each estimate, until final completion and acceptance of all work covered by the Contract. The progress payment shall not constitute an acceptance of the work.

21. ACCEPTANCE AND FINAL PAYMENT - Upon completion of the work under the terms of the Contract and notification of the Engineer by the Contractor that the work is ready for final inspection and acceptance, the Engineer shall make the final inspection. When the Engineer finds the work acceptable under the terms of the Contract and has been presented all claims for extra work and materials, the Engineer shall, within thirty (30) days make a Final Estimate of the work done, and certify in writing the amount due the Contractor; and if the work is accepted by the Common Council, the City shall pay the amount so certified. The date of the final estimate shall establish the date of acceptance of the work, and the date of the beginning of the guarantee for such work hereunder. The City of Lockport shall retain from such final payment an amount equal to two times the value of any remaining items to be completed.

Acceptance and final payment for such remaining items of work shall be in the manner provided herein for acceptance and final payment for the major portions of the Contract work.

Unless otherwise provided in this agreement, by State law or otherwise expressly agreed to by the parties to this agreement, final payment under this agreement or settlement upon termination of this agreement shall not constitute a waiver of the owner's claims against the Contractor of his sureties under this agreement or applicable performance and payment bonds.

22. DIRECTIONS OF THE ENGINEER - It is further agreed that so long as any lawful or proper direction concerning the work or materials given by the Engineer or his representatives shall remain uncomplied with, the Contractor shall not be entitled to have any estimate made for the purpose of payment, nor shall any estimate be rendered on account of work done or material furnished, until such lawful or proper direction aforesaid has been fully and satisfactorily complied with.
23. DEDUCTIONS FOR UNCORRECTED WORK - If the Engineer and City deem it expedient to correct work damaged or done not in accordance with the Contract, an equitable deduction from the Contract Sum shall be made therefore.
24. RIGHT TO USE WORK - The City shall have the right to take possession of or use any part of the completed or partly completed work before final acceptance. Such possession or use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents.
25. CLAIMS FOR DAMAGES - The Contractor shall not be entitled to any claim for damages from hindrance or delay or from any cause whatsoever during the progress of the work or any part thereof, but such hindrance or delay may entitle said Contractor to an extension of time of the completion of the work.
26. AUTHORITY FOR EXTRAS - No allowance shall be made to the Contractor for extra work unless he has a written order from the Engineer authorizing such extra work, and unless the same, together with the prices thereof, are approved by the Engineer and the Common Council, and in every case where such extra work should be concealed from view when completed, it shall be measured at the time of excavation by the Engineer or his Deputy, and the Contractor shall give the Engineer time or notice to enable him to see such work before it is concealed from view.
- 26A. PAYMENT FOR WORK - Written notice of claims for Extra Work shall be given by the Contractor within ten (10) days after receipt of instructions from the Owner to proceed with the Extra Work, and also before any work is commenced, except in emergency endangering life or property. No claim shall be valid unless so made. In all cases, the Contractor's itemized estimate sheets showing all labor and material shall be submitted

to the Owner. The Owner's order for Extra Work shall specify any extension of the Contract Time and one of the following methods or payment:

- (a) Unit prices or combinations of unit prices which formed the basis of the original Contract.
- (b) Engineer will issue a written change order describing details of change and request Contractor acceptance and total cost of such change prior to accomplishing the work involved in the change.
- (c) A lump sum based on the Contractor's estimate and accepted by the Owner.
- (d) Actual cost plus 10 percent (10%) for overhead and 10% profit. Actual costs are defined as follows:
 - (1) Labor costs, including time of foreman while engaged directly upon extra work.
 - (2) Labor, insurance, and taxes.
 - (3) Materials and supplies actually used on the work.
 - (4) Associated General Contractors of America standard rental rates on each piece of equipment having a value in excess of \$100. Equipment and tools of lesser value are considered "small tools", and as such, are considered to be part of overhead.
- (e) Where the quantity of work with respect to any item that is covered by a unit price differs materially and significantly from the quantity of such work indicated in the Contract Documents, an appropriate Change Order shall be issued on recommendation of ENGINEER to adjust the unit price.

27. PAYMENTS WITHHELD - The Engineer may withhold, or on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary in his reasonable opinion to protect the City from loss on account of:

- (a) Defective work not remedied.
- (b) Claims filed or reasonable evidence indicating probable filing of claims.
- (c) Failure of the Contractor to make payments properly to subcontractors or for material of labor.
- (d) A reasonable doubt that the Contract can be completed for the balance then unpaid.
- (e) Damage to another contractor.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

28. CORRECTION OF WORK BEFORE FINAL PAYMENT

- (a) Contractor shall promptly remove from the premises, all materials condemned by the Engineer as failing to meet Contract requirements, whether incorporated in the work or not; and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the City, and shall bear the expense of making good all work of other Contractors destroyed by such removal or replacement.
- (b) If the Contractor does not remove such condemned work and materials within ten (10) days after written notice, the City may remove them and may store the materials at the expense of the Contractor. If the Contractor does not pay the expense of such removal within (10) days time thereafter, the City may upon ten (10) days written notice, sell such materials at auction or at private sale and shall pay to the Contractor the net proceeds thereof, after deducting all costs and expenses that should have been born by the Contractor.

29. GUARANTEE PERIOD

- (a) At the completion and acceptance of the work, the Contractor shall submit to the City duplicate copies of the general guarantee for the entire work. The guarantee shall be unconditional and cover all labor, material and equipment furnished. All guarantees shall be written in a form satisfactory to the City.
- (b) The Contractor shall remedy any defective work appearing within one (1) year from the date of acceptance of the work, and shall pay for any damages caused by such defective equipment, work, or materials or occasioned in correcting the same.
- (c) If any defects occur within the guarantee period, the Contractor shall within three (3) days after receipt of notification of such defect, take the necessary action to correct such defects. The correction of any defects in equipment, materials and workmanship, which may develop during the guarantee period, shall be at the expense of the Contractor. If the Contractor fails to comply with the requirements of this paragraph within the time stated, the City may have the corrective work done and charge the Contractor therefore.

30. CITY'S RIGHT TO TERMINATE AND/OR COMPLETE CONTRACT

Should the Contractor become insolvent, or should he refuse or neglect to execute the work in a proper manner and as directed by the City, or otherwise fail in the performance of any of his obligations under this contract and surety after proper request fails to complete the Contract, then the City, upon the certification of the Engineer that sufficient cause exists to justify such action, and after giving the contractor and his surety seven (7) days written notice, may, without prejudice to any of the right or remedy, terminate the employment of the Contractor and take possession of the premises and of all materials, tools, and appliances thereon and finish the work by whatever method he may deem expedient. In such cases, no further payment shall be made to the Contractor until the work is completed. At which time, if the unpaid balance of the Contract Price shall exceed the expenses of finishing the work, such excess shall be paid to the Contractor. Should such expense exceed the unpaid balance, the Contractor and his sureties shall pay the difference to the City. The City shall audit and certify the expense incurred by him in finishing the work and the damage incurred through the Contractor's fault.

31. CONTRACTOR'S LIABILITY INSURANCE

- (a) The Contractor shall secure and maintain such insurance policies as will protect himself, his sub-contractors, and unless otherwise specified, the city from claims for bodily injuries, death or property damage which may arise from operations under this Contract, whether such operations be by himself or by any sub-contractor or anyone employed by them directly or indirectly. The following insurance policies are required:
 - (1) Statutory Workmen's Compensation - Proof **must** be submitted that the contractor has obtained the required Workers' Compensation and disability benefits. (State Forms C-105.2 and DB-120.1 or Form U-26.3, and Form SI-12 or DB-155) If the contractor is not required by law to provide Workers' Compensation and/or disability benefits he must submit State Form C-105.21.
 - (2) Contractor's Public Liability of Property Damage. (Bodily injury, property damage, combined \$1,000,000 each occurrence; \$2,000,000 aggregate.)
 - (3) Contractor's Protective Public Liability covering operation of subcontractors, with same limits.

- (4) Automobile Public Liability and Property Damage covering both owned and hired vehicles. (Bodily injury and property damage \$1,000,000 combined single limit; \$1,000,000 aggregate.)
 - (5) Prior to the storage or use of explosives, the contractor shall provide evidence of increase in limits of Public Liability, Property Damage and Contractor's Protective Public Liability Insurance to: Bodily Injury \$1,000,000 each accident; Property Damage \$500,000 each accident.
 - (6) Fire and Extended Coverage. (In an amount equal to the bid price of the Contract.)
- (b) Binders of such insurance shall be filed with the City prior to start of work and shall be subject to approval for adequacy of protection. Said Certificates of Insurance shall contain a ten (10) day notice of cancellation in favor of the City.
32. CITY'S LIABILITY INSURANCE - For the duration of this Contract, the Contractor shall maintain insurance in the name of the City and Engineer for the same limits of liability and containing the same specific endorsements which the Contractor places on the insurance required in paragraph 31. This insurance shall conform to the requirements and restrictions imposed by paragraph 31. Original and one certified copy of the policy shall be filed with the City.
33. SURETY BONDS - The Contractor shall furnish and pay for surety bonds each in an amount at least equal to 100 percent (100%) of the contract price as security for the faithful performance of the contract, and for the payment to all persons performing labor and furnishing materials in connection with the contract. The surety shall be in such form or forms as the City may prescribe and with such sureties as he may approve.
- The Surety shall guarantee that the contractor shall remedy any defective work appearing within one (1) year from the date of acceptance of the work, and shall pay for any damages caused by such defective equipment, work or materials or occasioned in correcting the same under the terms of the Contract.
34. LIENS AND OUTSTANDING DEBTS - Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the City a complete release of all liens arising out of this Contract, or receipts in full in lien thereof, and if required in either case, an affidavit which certifies so far as he has knowledge or information that the release and receipts include all the labor and materials for which a lien could be filed; but the contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the City, to indemnify the City against any lien. Upon request of the City, the Contractor shall at his own expense, by bonding it or otherwise, secure the prompt discharge of any lien or liens which may be filed against the property as a result of this Contract. Before the final payment is made for the work completed under this Contract, the Contractor shall submit evidence satisfactory to the City, that all payrolls, material bills and other indebtedness connected with the work have been paid.
35. ADDITIONAL ENGINEERING EXPENSE - In the event that the Engineer is required to provide additional engineering services as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's expense in connection with such additional services shall be paid to City by the Contractor.
36. RESPONSIBILITY FOR ADJOINING STRUCTURES - The Contractor shall assume full responsibility for the protection of all pavements, curbs, bridges, railroads, poles and any other surface structures, and all water mains, sewers, telephone, gas mains, and other underground services and structures along and near the work which may be affected by his operations, and shall indemnify, defend and save harmless the City against all damages or alleged damages to any such structure arising out of his work. The Contractor shall be responsible

for notifying the Utilities sufficiently in advance of any contemplated work, and shall obtain from the Utility accurate locations of their facilities. All such structures shall be maintained in good working order at all times during the progress of the work. If necessary, they shall be shored up in a manner suitable to the Engineer.

If the contractor for any reason removes the whole or part of any culvert, subdrain, drain pipe or other subsurface structure, same shall be replaced at the expense of the Contractor to a condition equal to that existing before operations started and to the satisfaction of the Engineer. No additional item of payment will be made by virtue of the expense incurred by the Contractor for this purpose, and the Contractor shall take this into consideration when preparing his bid.

If the material from the excavation in any way becomes lodged in any culvert, drain or gutter, said material shall be removed and the culvert, drain and gutter restored to its original condition at the expense of the Contractor.

37. PROTECTION OF TREES AND SHRUBBERY - No trees or shrubbery of any kind shall be removed or destroyed by the Contractor without the written permission of the Engineer, and the Contractor will be held fully responsible for any damages caused by his work to adjoining trees and shrubs. Ample precautions shall be taken by the Contractor to protect such trees and shrubs as are to remain in place by surrounding them with fences or other protection before construction work begins. Shrubbery that has to be removed shall be preserved and replaced in a manner acceptable to the Engineer.

Any trees or shrubbery damaged that are not in the actual trench line shall be replaced by the Contractor at his own expense. If, in the opinion of the Engineer, a tree which is in the line of the trench can be saved by tunneling, the Contractor shall tunnel under such tree or trees, doing all the work necessary as directed by the Engineer. Trees indicated to be removed are within three (3) feet of the trench center line. Wherever possible, trees shall be saved. No additional item of payment will be made for the work so ordered.

38. FINAL RESTORATION - The Contractor shall restore any and all objects and areas, which are disturbed in any way as a result of the project, to a condition at least equal to the condition of quality and quantity which existed prior to the project, in accordance with the respective items of the contract, the requirements of the Engineer, the requirements of the City Street Department and the reasonable request of the property owners involved. The cost of final restoration shall be included in the various items of the Contract, or as otherwise noted.

39. SUNDAY AND NIGHT WORK - The normal work week is Monday through Friday between the hours of 8 a.m. and 5 p.m. Ordinarily, no other work shall be carried on which will require the presence of the Engineer or an inspector, except with written request to, and permission of the Engineer.

40. PROGRESS SCHEDULE - The Contractor shall submit for approval immediately after execution of the Agreement, a carefully prepared Progress Schedule, showing the proposed dates of starting and completing each of the various sections of the work.

41. CERTIFICATE OF COMPLETION - A Certification of proper completion of the Contract, prepared by the Engineer, shall be issued and signed by the Engineer and the Contractor prior to issuance of Final Payment and shall include a full release by the Contractor and his Subcontractors for any and all claims against the City of Lockport.

42. CERTIFIED PAYROLLS - The contractor shall submit weekly for each week in which any contract work that is performed a certified copy of all payrolls to the City Engineering Office. This information may be submitted in any form desired - Form WH-347 is available for this purpose and may be obtained from the City Engineering Office. The prime contractor is responsible for the submission of certified copies of payrolls by all subcontractors.

43. CONTRACTOR'S LICENSE - Prior to starting construction the Contractor awarded the project shall have a City of Lockport Contractor's License. This license is available at the City Building Inspection Department upon completion of the license application, proof of insurance and Workman's Compensation and payment of \$200.00. The license is valid from January through December of the year issued. Proof of insurance shall be a Certificate of insurance in the amounts listed in the General Conditions, Paragraph 31. Form C-105.2 must be submitted for proof of Workers' Compensation.
44. PRE-CONSTRUCTION CONFERENCE & PROGRESS MEETINGS
- A. The Contractor shall schedule a pre-construction conference and organizational meeting at the City Engineering Department or at another convenient location prior to commencement of construction activities. The Contractor shall conduct the meeting to review responsibilities and personnel assignments.
 - B. Attendees: Authorized Representatives of the Owner, the Engineer, Architect and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers, and other concerned parties shall be represented at the conference. All participants at the conference shall be familiar with the project and authorized to conclude matters relating to the Work.
 - C. Agenda: Discuss items of significance that could affect progress including such topics as:
 - 1. Tentative construction schedule.
 - 2. Critical Work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.
 - 5. Procedures for processing Applications for Payment.
 - 6. Distribution of Contract Documents.
 - 7. Submittal of Shop Drawings, Product Data and Samples.
 - 8. Preparation of record documents.
 - 9. Use of premises.
 - 10. Parking available.
 - 11. Office, Work and storage areas.
 - 12. Equipment deliveries and priorities.
 - 13. Safety procedures.
 - 14. First aid.
 - 15. Security.
 - 16. Housekeeping.
 - 17. Working hours.
 - 18. Subcontractors.
 - 19. Preliminary schedule of Shop Drawings and Samples.
 - 20. Minority Business Enterprise Goals.
 - 21. Co-ordination with other contractors.
 - 22. Insurance in force.
 - 23. Contractor's Schedule of Values.
 - D. Progress Meetings: The Contractor shall conduct progress meetings at the Project site at regularly scheduled intervals. Notify the Owner and Engineer of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.

End of General Conditions



Kathy Hochul, Governor

Roberta Reardon, Commissioner

City of Lockport
Jay Zgoda
Nussbaumer & Clarke, Inc.
3556 Lake Shore Road
Suite 500
Lockport NY 14219

Schedule Year 2024
Date Requested 04/29/2024
PRC# 2024004965

Location Lockport
Project ID# 21J1-0119
Project Type Lockport RWPS Improvements

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Wage Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2024 through June 2025. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12226

General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission; a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion [online](#).

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule from the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12226; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.ny.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment. Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, but are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed \$100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds \$25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8 . Section 220-a).

Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYS DOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "[Public Work Project](#)" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers. compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers. Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeyworkers in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above or is performing work outside the classification of work for which the apprentice is indentured, must be paid the prevailing journeyworker's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12226 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b)).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of \$50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c)).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d)).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.



Kathy Hochul, Governor

Roberta Reardon, Commissioner

City of Lockport
Jay Zgoda
Nussbaumer & Clarke, Inc.
3556 Lake Shore Road
Suite 500
Lockport NY 14219

Schedule Year 2024
Date Requested 04/29/2024
PRC# 2024004965

Location Lockport
Project ID# 21J1-0119
Project Type Lockport RWPS Improvements

Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), **MUST** be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

Contractor Information

All information must be supplied

Federal Employer Identification Number: _____		
Name: _____		
Address: _____ _____		
City: _____	State: _____	Zip: _____
Amount of Contract: \$ _____	Contract Type:	
Approximate Starting Date: ____/____/____	<input type="checkbox"/> (01) General Construction	
Approximate Completion Date: ____/____/____	<input type="checkbox"/> (02) Heating/Ventilation	
	<input type="checkbox"/> (03) Electrical	
	<input type="checkbox"/> (04) Plumbing	
	<input type="checkbox"/> (05) Other : _____	

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12226

Social Security Numbers on Certified Payrolls:

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concern regarding inclusion of this information on payrolls if another identifier will suffice.

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to \$1,500 for a first offense and up to \$5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, <https://dol.ny.gov/public-work-and-prevailing-wage>

If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov .

Worker Notification: (Labor Law §220, paragraph a of subdivision 3-a)

Effective June 23, 2020

This provision is an addition to the existing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage and supplement rate* for their particular job classification *on each pay stub**. It also requires contractors and subcontractors to *post a notice* at the beginning of the performance of every public work contract *on each job site* that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her job classification. The required notification will be provided with each wage schedule, may be downloaded from our website www.labor.ny.gov or be made available upon request by contacting the Bureau of Public Work at 518-457-5589. *In the event the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

(12.20)

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12226

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.

Required Notice under Article 25-B of the Labor Law

**Attention All Employees, Contractors and Subcontractors:
You are Covered by the Construction Industry Fair Play Act**

The law says that you are an employee unless:

- You are free from direction and control in performing your job, **and**
- You perform work that is not part of the usual work done by the business that hired you, **and**
- You have an independently established business.

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.

Employee Rights: If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor, **you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

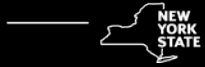
Penalties for paying workers off the books or improperly treating employees as independent contractors:

- **Civil Penalty** First offense: Up to \$2,500 per employee
 Subsequent offense(s): Up to \$5,000 per employee
- **Criminal Penalty** First offense: Misdemeanor - up to 30 days in jail, up to a \$25,000 fine and debarment from performing public work for up to one year.
 Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a \$50,000 fine and debarment from performing public work for up to 5 years.

If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.

Employer Name:

IA 999 (09/16)



Attention Employees

THIS IS A: **PUBLIC WORK PROJECT**

If you are employed on this project as a **worker, laborer, or mechanic** you are entitled to receive the **prevailing wage and supplements rate** for the classification at which you are working.

Your pay stub and wage notice received upon hire must clearly state your wage rate and supplement rate.

Chapter 629 of the Labor Laws of 2007:

These wages are set by law and must be posted at the work site. They can also be found at:
<https://dol.ny.gov/bureau-public-work>



If you feel that you have not received proper wages or benefits, please call our nearest office.*

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 932-2419	White Plains	(914) 997-9507
Newburgh	(845) 568-5287		

* For New York City government agency construction projects, please contact the Office of the NYC Comptroller at (212) 669-4443, or www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is \$250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date.*)
- Training roster, attendance record or other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is \$3 million in Bronx, Kings, New York, Queens and, Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1, 1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3
Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
Bureau of Public Work
State Office Campus, Bldg. 12
Albany, NY 12226

District Office Locations:	Telephone #	FAX #
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Garden City	516-228-3915	516-794-3518
Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

Niagara County General Construction

Boilermaker **07/01/2024**

JOB DESCRIPTION Boilermaker **DISTRICT 12**

ENTIRE COUNTIES
 Allegany, Cattaraugus, Chautauqua, Chemung, Erie, Genesee, Livingston, Monroe, Niagara, Ontario, Orleans, Schuyler, Steuben, Wayne, Wyoming, Yates

WAGES
 Per hour: 07/01/2024
 Boilermaker \$ 36.10

The wage rate will be 90% of the above for Maintenance work on boilers less than 100,000 pph.

SUPPLEMENTAL BENEFITS
 Per hour: \$ 32.30*

*NOTE: \$31.06 of this amount is for every Hour "Paid"

OVERTIME PAY
 See (B, E, Q) on OVERTIME PAGE

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES
 1st Term at 12 Months
 Terms 3-8 at 6 Months
 Per Hour:
 1st 65%
 3rd 70% 4th 75% 5th 80% 6th 85% 7th 90% 8th 95%

Supplemental Benefits per hour:
 All Terms \$ 32.30**

**NOTE: \$31.06 of this amount is for every Hour "Paid"

12-7

Carpenter - Building **07/01/2024**

JOB DESCRIPTION Carpenter - Building **DISTRICT 12**

ENTIRE COUNTIES
 Genesee, Niagara, Orleans

PARTIAL COUNTIES
 Wyoming: Only the Townships of Arcade, Attica, Bennington, Covington, Eagle, Java, Middlebury, Orangeville, Sheldon and Wethersfield.

WAGES
 Per hour: 07/01/2024
 Carpenter \$ 34.26
 Floorlayer 34.26
 Certified Welder 35.26
 Hazardous Waste Worker 35.76
 Diver-Dry Day 35.26
 Diver Tender 35.26
 Diver-Wet Day** 61.25

Hazardous Waste Worker: Hazardous sites requiring personal protective equipment.

** Diver rate applies to all hours worked on the day of dive.

Depth pay for diver:	0' to 80'	no additional fee
	81' to 100'	additional \$0.50 per foot
	101' to 150'	additional \$0.75 per foot
	151' and deeper	additional \$1.25 per foot
 Penetration pay:	0' to 50'	no additional fee
	51' to 100'	additional \$0.75 per foot

101' and deeper additional \$1.00 per foot

SHIFT WORK

On Agency/Owner mandated shift work, the following rates will be applicable:

- 1st Shift - Regular Rate
- 2nd Shift - Premium of 7% of base wage per hour
- 3rd Shift - Premium of 14% of base wage per hour

Shift work shall be defined as implementing at least two (2) shifts in a twenty-four (24) consecutive hour period. Shift work must be for a minimum of three (3) consecutive days.

SUPPLEMENTAL BENEFITS

Per hour worked:

Carpenter(s)	\$ 26.65
Diver Wet	26.65
Diver Dry & Tender	26.65

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

Floorlayer Apprentices:

1st	2nd	3rd	4th
65%	70%	75%	80%

Carpenter Apprentices:

1st	2nd	3rd	4th
65%	70%	75%	80%

Supplemental Benefits All per hour worked:

1st	2nd	3rd	4th
\$12.79	\$12.81	\$15.44	\$15.45

12-276B-Gen

Carpenter - Building / Heavy&Highway

07/01/2024

JOB DESCRIPTION Carpenter - Building / Heavy&Highway

DISTRICT 2

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

PARTIAL COUNTIES

Orange: The area lying on Northern side of Orange County demarcated by a line drawn from the Bear Mountain Bridge continuing west to the Bear Mountain Circle, continue North on 9W to the town of Cornwall where County Road 107 (also known as Quaker Rd) crosses under 9W, then east on County Road 107 to Route 32, then north on Route 32 to Orrs Mills Rd, then west on Orrs Mills Rd to Route 94, continue west and south on Route 94 to the Town of Chester, to the intersection of Kings Highway, continue south on Kings Highway to Bellvale Rd, west on Bellvale Rd to Bellvale Lakes Rd, then south on Bellvale Lakes Rd to Kain Rd, southeast on Kain Rd to Route 17A, then north and southeast along Route 17A to Route 210, then follow Route 210 to NJ Border.

WAGES

Wages per hour: 07/01/2024

Carpenter - ONLY for Artificial Turf/Synthetic Sport Surface	\$ 36.48
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Note - Does not include the operation of equipment. Please see Operating Engineers rates.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 26.55
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OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

HOLIDAY

Paid: See (5) on HOLIDAY PAGE
 Overtime: See (5, 6, 16) on HOLIDAY PAGE

Notes:

When a holiday falls upon a Saturday, it shall be observed on the preceding Friday. When a holiday falls upon a Sunday, it shall be observed on the following Monday.

An employee taking an unexcused day off the regularly scheduled day before or after a paid Holiday shall not receive Holiday pay.

REGISTERED APPRENTICES

Wages per hour (1300 hour terms at the following percentage of Journeyworker's wage):

1st	2nd	3rd	4th
65%	70%	75%	80%

Supplemental Benefits per hour:

\$18.58	\$19.14	\$21.24	\$21.79
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2-42AtSS

Carpenter - Heavy&Highway

07/01/2024

JOB DESCRIPTION Carpenter - Heavy&Highway

DISTRICT 12

ENTIRE COUNTIES

Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour: 07/01/2024
 Heavy Highway:

Carpenter	\$ 41.19
Certified Welder	43.69
Diver-Dry Day	42.19
Diver-Wet Day**	66.19
Diver Tender	42.19
Hazardous Material Worker	43.69
Piledriver	41.19
Piledriver Welder	43.69
Effluent & Slurry Diver-Dry Day	63.29
Effluent & Slurry Diver-Wet Day	99.29

NOTE ADDITIONAL AMOUNTS PAID FOR THE FOLLOWING WORK LISTED (per hour worked):

- State designated hazardous site, requiring protective gear shall be an additional \$2.50 per hour.
- Certified Welders when required to perform welding work will receive an additional \$2.50 per hour.

** Diver rate applies to all hours worked on the day of dive.

Depth pay for divers:	0' to 50'	no additional fee
	51'to 100'	additional \$0.50 per foot
	101' to 150'	additional \$0.75 per foot
	151' to 200'	additional \$1.25 per foot

Penetration pay:	0' to 50'	no additional fee
	51' to 100'	additional \$0.75 per foot
	101' to deeper	additional \$1.00 per foot

SUPPLEMENTAL BENEFITS

Per hour worked:

Carpenter(s)	\$ 30.10
Diver(s)	31.84
Pile Driver	31.84

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

In the event a Holiday falls on a Saturday, the Friday before will be observed as a Holiday. If a Holiday falls on a Sunday, then Monday will be observed as a Holiday. Employee must work scheduled workday before and after the Holiday.

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

Carpenter Apprentices:

1st	2nd	3rd	4th	5th
65%	70%	75%	80%	85%

Pile Driver Apprentices(1300hour terms at percentage of Pile Driver Rate)

1st	2nd	3rd	4th
65%	70%	75%	80%

Supplemental benefits Carpenter/Pile Driver per hour worked:

1st	2nd	3rd	4th	5th
\$ 19.56	\$ 20.19	\$ 22.36	\$ 22.99	\$23.62

12-276HH-Gen

Electrician

07/01/2024

JOB DESCRIPTION Electrician

DISTRICT 3

ENTIRE COUNTIES

Niagara

PARTIAL COUNTIES

Orleans: Only the Townships of Albion, Barre, Carlton, Gaines, Ridgeway, Shelby and Yates.

WAGES

Per hour: 07/01/2024

Electrician*	\$ 42.20
Cable Splicer	46.42**

* Includes teledata work.

** Note - Applies for taped splices and taped terminations on shielded cable 5KV and over; for taped splices and taped terminations on all cable over 15KV; for all lead cable splices and terminations; for manufactured, slip-on and kit type splices and terminations over 15KV.

Work performed over 35' to 50' high - \$0.45 shall be added to regular rate.

Work performed over 50' high - \$0.90 shall be added to regular rate.

Work performed in tunnels over 25' deep or 75' long - \$0.45 shall be added.

Hazardous waste work - supplied air as in OSHA Class A - \$4.00 additional.

Hazardous waste work - as in OSHA Class B and C - \$2.50 additional.

SUPPLEMENTAL BENEFITS

Per hour: \$ 31.33*

* NOTE - add 3% of the posted straight time or applicable premium wage rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

Day after Thanksgiving is paid at 1 1/2 the hourly rate if worked.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following percentage of Journeyman's wage:

0 to 1000	to 2000	to 3500	to 5000	to 6500	to 8000
40%	45%	50%	60%	70%	85%

Supplemental benefits per hour worked:

0 to 2000	to 3500	to 5000	to 6500	to 8000
\$ 13.97*	\$ 30.40*	\$ 30.57*	\$ 30.82*	\$ 31.08*

* NOTE - add 3% of the posted straight time or applicable premium wage rate.

3-237

Elevator Constructor

07/01/2024

JOB DESCRIPTION Elevator Constructor

DISTRICT 3

ENTIRE COUNTIES

Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour: 07/01/2024
 Elevator Constructor \$ 59.82
 Helper 41.87

SUPPLEMENTAL BENEFITS

Per hour: \$ 37.89

Note - add 6% of regular hourly rate for all hours worked.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 16) on HOLIDAY PAGE
 Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One year (1,700 hour each) terms at the following percentage of Journeyman's wage:

1st*	2nd	3rd	4th
55%	65%	70%	80%

Supplemental benefits per hour: \$ 37.89

* Note - 0-6 months of the 1st year term is paid at 50% of Journeyman's wage with no Supplemental benefits.

Note - add 6% of regular hourly rate for all hours worked.

3-14

Glazier 07/01/2024

JOB DESCRIPTION Glazier

DISTRICT 3

ENTIRE COUNTIES

Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour: 07/01/2024

Glazier \$ 31.68
 Working off Suspended
 Scaffold (Swing Stage) 33.68
 Maintenance 20.20*

* Note - This rate to be used only for all repair and replacement work such as glass breakage, glass replacement, door repair and board ups.

SUPPLEMENTAL BENEFITS

Per hour:
 Journeymen Glazier \$ 27.89
 Maintenance 17.86

OVERTIME PAY

See (B, E2, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE for Glazier and Glazier Apprentice
 Paid: See (5, 6) on HOLIDAY PAGE for Maintenance
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Glazier: 1000 hour terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 18.50	\$ 19.50	\$ 20.50	\$ 21.50	\$ 22.50	\$ 23.50	\$ 24.50	\$ 25.50

Supplemental benefits per hour:

1st & 2nd terms \$ 8.60
 3rd & 4th terms 11.10

5th & 6th terms	12.60
7th & 8th terms	14.10

3-660

Insulator - Heat & Frost **07/01/2024**

JOB DESCRIPTION Insulator - Heat & Frost **DISTRICT 3**

ENTIRE COUNTIES
 Allegany, Cattaraugus, Chautauqua, Erie, Niagara, Wyoming

PARTIAL COUNTIES
 Genesee: Only the Townships of Alabama, Alexander, Darien, Oakfield and Pembroke.

WAGES
 Per Hour: 07/01/2024
 Heat & Frost Insulator \$ 36.85

SUPPLEMENTAL BENEFITS
 Per hour:
 \$ 29.29

OVERTIME PAY
 See (B, *E, **Q) on OVERTIME PAGE
 * Note - Double time after 10 hours on Saturday.
 ** Note - Triple time on Labor Day if WORKED.

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES
 Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
60%	70%	75%	80%

Supplemental Benefits per hour:

1st	\$ 8.96
2nd	12.54
3rd	29.29
4th	29.29

3-4

Ironworker **07/01/2024**

JOB DESCRIPTION Ironworker **DISTRICT 3**

ENTIRE COUNTIES
 Niagara

PARTIAL COUNTIES
 Erie: Only that portion of the Township of Grand Island north of Whitehaven Road.
 Orleans: Only the Townships of Ridgeway, Shelby and Yates.

WAGES
 Per hour: 07/01/2024

Structural	\$ 34.75
Ornamental	34.75
Reinforcing	34.75
Rigger & Mach. Mover	34.75
Pre-Engineered	34.75
Fence Erector	34.75
Pre-Cast Erector	34.75
Welder	34.75
Window Erector	34.75

SHIFT WORK
 When shift work is mandated either in the job specification or by the contracting agency the following premiums apply:
 10% for second shift work from 2:00PM - 7:00PM
 15% for third shift work from 7:00PM - 12:00AM

When a single irregular shift is worked outside the standard workday with the start times based on second and third shifts, a 10% premium on hours worked applies.

SUPPLEMENTAL BENEFITS

Per hour: \$ 33.69

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following wage:

1st term	\$ 21.50
2nd term	23.50
3rd term	25.50
4th term	27.50

Supplemental benefits per hour:

1st term	\$ 13.28
2nd term	21.26
3rd term	22.40
4th term	23.54

3-9

Laborer - Building

07/01/2024

JOB DESCRIPTION Laborer - Building

DISTRICT 3

ENTIRE COUNTIES

Niagara

WAGES

GROUP 1: Basic.

GROUP 2: Curb and Flatwork Formsetter not on structures, Gunnite Nozzlemen, Sand Blasters, Burning Torch, Operator of Concrete Saw.

GROUP 3: Potman, Pipelayers, Pavement Breakers, Jackhammer Operators, Barco Rammers, Chain Saw, Powder Monkey, Black Top Rakers, Scalers, Drill Helpers, Mortar Mixers, Men Working from Swing Scaffold, Bosun Chair, or suspended cage or bucket, Work in Caissons below 8 feet, Concrete Motor Buggy, Operators of Mechanical Tools.

GROUP 4: Blasters, Grade Checkers.

GROUP 5: Men Working with asbestos, hazardous waste or toxic material.

GROUP 6: Wagon drill, Air Track, Welder.

GROUP 7: Video Machine.

GROUP 8: Supplied Air Respirators.

GROUP 9: Laser Beam.

Per hour: 07/01/2024

GROUP 1	\$ 34.90
GROUP 2	35.50
GROUP 3	35.20
GROUP 4	38.39
GROUP 5	36.90
GROUP 6	35.90
GROUP 7	35.40
GROUP 8	39.90
GROUP 9	35.75

SHIFT WORK

The following premiums apply when shift work is mandated by the job specifications or by the contracting agency:

15% for work from 4:30 p.m. to 12:30 a.m.

20% for work from 12:30 a.m. to 8:00 a.m.

Note: All work from Saturday 8:00am until Monday 8:00am shall be overtime at double time rate when shift work is concerned.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 41.41

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1000 hour terms at the following percentage of basic Journeyman's wage:

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental benefits per hour:

\$ 41.41

3-91b

Laborer - Heavy&Highway

07/01/2024

JOB DESCRIPTION Laborer - Heavy&Highway

DISTRICT 3

ENTIRE COUNTIES

Niagara

WAGES

Heavy/Highway & Sewer/Water Laborer:

GROUP 1: Basic.

GROUP 2: Blasters, Grade Checkers.

GROUP 3: Curb and Flatwork Formsetter not on structures, Gunnite Nozzlemen, Tree Topper, Sand Blasters, Burning Torch, Operator of Concrete Saw and Utility Pile Driver.

GROUP 4: Potman, Pipelayer, Pavement Breakers or Busters, Jack Hammer Operator, Video Machine, Barco Rammers, Chain Saw, Powder Monkey, Black Top Rakers, Scalers, Drill Helpers, Mortar Mixers, Men Working from Swinging Scaffold, Bosun Chair, Suspended Cage or Bucket, Work in Caissons below 8 ft, Concrete Motor Buggy, All other operators of Mechanical Tools, including Vibrators regardless of type of power and Boat men.

GROUP 5: Chemical Waste Men Working With Hazardous Waste and Toxic materials as defined in Article VI, Section 2C or in areas of radioactive material and asbestos as specified in bidding documents and specifications. The removal of lead.

GROUP 6: Welder, Wagon Drill, Air track Drill, Self Contained Drill.

GROUP 7: Laser Beam.

GROUP 8: Supplied Air Respirators.

GROUP 9: Respirator required for busting.

GROUP 10: Respirator required due to atmospheric conditions (excluding respirators required for hazardous waste, toxic materials, asbestos or lead abatement).

Per hour:

07/01/2024

GROUP 1	\$ 34.90
GROUP 2	38.39
GROUP 3	35.50

GROUP 4	35.20
GROUP 5	36.90
GROUP 6	35.90
GROUP 7	35.75
GROUP 8	39.90
GROUP 9	35.40
GROUP 10	35.90

SHIFT WORK

The following premiums apply when shift work is mandated by the job specifications or by the contracting agency:

15% for work from 4:30 p.m. to 12:30 a.m.

20% for work from 12:30 a.m. to 8:00 a.m.

Note: All work from Saturday 8:00am until Monday 8:00am shall be overtime at double time rate when shift work is concerned.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 41.61

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1000 hour terms at the following percentage of basic Journeyman's wage:

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental benefits per hour:

\$ 41.61

3-91h/s

Laborer - Tunnel

07/01/2024

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 3

ENTIRE COUNTIES

Niagara

WAGES

COMPRESSED AIR:

GROUP 1: Powder Watchmen, Changehouse Attendent and Top Laborers.

GROUP 2: Blasters, Mucking Machine Operators.

GROUP 3: All Tunnel Workers including Miners, Drill Runners, Iron Men, Maint. Men, Muck Men, Inside Mucklock Tender, Pumpmen, Electricians, Cement Finishers, Rodmen, Caulkers, Carpenters, Hydraulic Men, Shield Drivers, Monorail Operators, Motormen, Conveyor Men, Safety Miners, Powdermen, Pan Men, Riggers, Miner's Helper, Chuck Tenders, Track Men, Nippers, Brakemen, Derail Men, Cable Men, Hose Men, Grout Men, Gravel Men, Form Workers, Concrete Workers, Tunnel Laborers, and Caulkers Helpers.

GROUP 4: Bottom Bell, Mole Nippers per working shaft per shift up to and including two Moles.

GROUP 5: Top Nipper.

GROUP 6: Top Bell, Signal Men, Shaft Men, Outside Man, Lock Tender, Gauge Tender, Outside Muck Lock Tender.

GROUP 7: Divers.

GROUP 8: Diver Tenders.

Per hour: 07/01/2024

GROUP 1	\$ 34.90
GROUP 2	47.12
GROUP 3	45.37

GROUP 4	43.63
GROUP 5	41.88
GROUP 6	40.14
GROUP 7	46.59
GROUP 8	26.59

For degrees of pressure between 26lbs & 30lbs an additional \$3.50 per hr.
 For degrees of pressure between 31lbs & 35lbs an additional \$4.50 per hr.
 For degrees of pressure between 36lbs & 40lbs an additional \$5.50 per hr.
 For degrees of pressure between 41lbs & over an additional \$6.50 per hr.
 Additional \$1.00 per hr. for concrete handling in building of bulkheads for locks also men working in Caissons, Cofferdams and Cylinders under pressure.
 Additional \$1.00 per hr. for Top Laborer using an air spade, jackhammer or pavement breaker.

SHIFT WORK

The following premiums apply when shift work is mandated by the job specifications or by the contracting agency:

15% for work from 4:30 p.m. to 12:30 a.m.

20% for work from 12:30 a.m. to 8:00 a.m.

Note: All work from Saturday 8:00am until Monday 8:00am shall be overtime at double time rate when shift work is concerned.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 41.61

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1000 hour terms at the following percentage of GROUP 1 Journeyman's wage:

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental benefits per hour:

\$ 41.61

3-91t/ca

Laborer - Tunnel

07/01/2024

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 3

ENTIRE COUNTIES

Niagara

WAGES

FREE AIR:

GROUP 1: Mole Nipper, Powder Watchmen, Changehouse Attendant and Top Laborers

GROUP 2: Borers Helper, Tunnel Workers, Miners, Drill Runners, Maintenance Men, Conveyor Men, Safety Miner, Block Layers, Rod man, Powder Carriers, Miners Helpers, Chuck Tenders, Track Men, Nippers, Burners, Brake Men, Derail Men, Cable Men, Hosemen, Grout Men, Gravel Men, Form Men, Bottom Bell, Top Bell, Signal Men, Form Workers, Movers, Concrete Workers, Shaft Man, and Tunnel Laborers.

GROUP 3: Blasters, Welders, Steel Erectors, Piledrivers, Riggers, Cement Finishers and Ironmen.

GROUP 4: Electricians.

GROUP 5: Divers.

GROUP 6: Diver Tender.

Per hour: 07/01/2024

GROUP 1	\$ 34.90
GROUP 2	40.14
GROUP 3	41.88
GROUP 4	43.63

GROUP 5 46.59
GROUP 6 26.59

Additional \$1.00 per hr. for Top Laborers using an air spade, jackhammer or pavement breaker.
Additional \$ 0.75 per hr. for all employed at tunnel level in pipe jacking operations.
For CAISSON, COFFERDAMS and CYLINDERS: See compressed air tunnel rates.

SHIFT WORK

The following premiums apply when shift work is mandated by the job specifications or by the contracting agency:

15% for work from 4:30 p.m. to 12:30 a.m.

20% for work from 12:30 a.m. to 8:00 a.m.

Note: All work from Saturday 8:00am until Monday 8:00am shall be overtime at double time rate when shift work is concerned.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 41.61

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1000 hour terms at the following percentage of GROUP 1 Journeyman's wage:

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental benefits per hour:

\$ 41.61

3-91t/fa

Lineman Electrician

07/01/2024

JOB DESCRIPTION Lineman Electrician

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

WAGES

A Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors, assembly of all electrical materials, conduit, pipe, or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

Crane Operators: Operation of any type of crane on line projects.

Crawler Backhoe: Operation of tracked excavator/crawler backhoe with 1/2 yard bucket or larger on line projects.

Digging Machine Operator: All other digging equipment and augering on line projects.

A Groundman/Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator/equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

NOTE: Includes Teledata Work within ten (10) feet of High Voltage Transmission Lines. Also includes digging of holes for poles, anchors, footer, and foundations for electrical equipment.

Below rates applicable on all overhead and underground distribution and maintenance work, and all overhead and underground transmission line work and the installation of fiber optic cable where no other construction trades are or have been involved. Includes access matting for line work.

Per hour: 07/01/2024

Group A:

Lineman, Technician	\$ 58.90
Crane, Crawler Backhoe	58.90
Welder, Cable Splicer	58.90

Group B:

Digging Mach. Operator	53.01
Tractor Trailer Driver	50.07
Groundman, Truck Driver	47.12
Equipment Mechanic	47.12
Flagman	35.34

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all electrical sub-stations, switching structures, fiber optic cable and all other work not defined as "Utility outside electrical work." Includes access matting for line work.

Group A:

Lineman, Technician	\$ 58.90
Crane, Crawler Backhoe	58.90
Cable Splicer	64.79
Certified Welder, Pipe Type Cable	61.85

Group B:

Digging Mach. Operator	53.01
Tractor Trailer Driver	50.07
Groundman, Truck Driver	47.12
Equipment Mechanic	47.12
Flagman	35.34

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all switching structures, maintenance projects, railroad catenary install/maintenance third rail installation, bonding of rails and pipe type cable and installation of fiber optic cable. Includes access matting for line work.

Group A:

Lineman, Tech, Welder	\$ 60.22
Crane, Crawler Backhoe	60.22
Cable Splicer	66.24
Certified Welder, Pipe Type Cable	63.23

Group B:

Digging Mach. Operator	54.20
Tractor Trailer Driver	51.19
Groundman, Truck Driver	48.18
Equipment Mechanic	48.18
Flagman	36.13

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all overhead and underground transmission line work & fiber optic cable where other construction trades are or have been involved. This applies to transmission line work only, not other construction. Includes access matting for line work.

Group A:

Lineman, Tech, Welder	\$ 61.41
Crane, Crawler Backhoe	61.41

Group B:

Digging Mach. Operator	55.27
Tractor Trailer Driver	52.20
Groundman, Truck Driver	49.13
Equipment Mechanic	49.13
Flagman	36.85

Additional \$1.00 per hour for entire crew when a helicopter is used.

SHIFT WORK

THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM to 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM to 1:00 AM REGULAR RATE PLUS 17.3 %
3RD SHIFT	12:30 AM to 9:00 AM REGULAR RATE PLUS 31.4 %

SUPPLEMENTAL BENEFITS

Per hour:

07/01/2024

Group A

\$ 30.90
 *plus 7% of
 the hourly
 wage paid

Group B

\$ 26.90
 *plus 7% of
 the hourly
 wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE. NOTE: Double time for all emergency work designated by the Dept. of Jurisdiction. WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.
 Overtime See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyworker's Lineman wage.

1st	2nd	3rd	4th	5th	6th	7th
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS per hour:

07/01/2024

\$ 26.90
 *plus 7% of
 the hourly
 wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249a

Lineman Electrician - Teledata

07/01/2024

JOB DESCRIPTION Lineman Electrician - Teledata

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour:

For outside work, stopping at first point of attachment (demarcation).

07/01/2024 01/01/2025

Cable Splicer	\$ 39.24	\$ 40.81
Installer, Repairman	\$ 37.24	\$ 38.73

Teledata Lineman	\$ 37.24	\$ 38.73
Tech., Equip. Operator	\$ 37.24	\$ 38.73
Groundman	\$ 19.74	\$ 20.53

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

SHIFT WORK

THE FOLLOWING RATES APPLY WHEN THE CONTRACTING AGENCY MANDATES MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION ARE WORKED. WHEN TWO (2) OR THREE (3) SHIFTS ARE WORKED THE FOLLOWING RATES APPLY:

1ST SHIFT	REGULAR RATE
2ND SHIFT	REGULAR RATE PLUS 10%
3RD SHIFT	REGULAR RATE PLUS 15%

SUPPLEMENTAL BENEFITS

Per hour:	07/01/2024	01/01/2025
Journeyworker	\$ 5.70 *plus 3% of the hour wage paid	\$ 5.70 *plus 3% of the hour wage paid

*The 3% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 16) on HOLIDAY PAGE

6-1249LT - Teledata

Lineman Electrician - Traffic Signal, Lighting **07/01/2024**

JOB DESCRIPTION Lineman Electrician - Traffic Signal, Lighting

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Warren, Washington, Wayne, Wyoming, Yates

WAGES

Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors which includes, but is not limited to road loop wires; conduit and plastic or other type pipes that carry conductors, flex cables and connectors, and to oversee the encasement or burial of such conduits or pipes.

Crane Operators: Operation of any type of crane on Traffic Signal/Lighting projects.

Crawler Backhoe: Operation of tracked excavator/crawler backhoe with 1/2 yard bucket or larger on Traffic Signal/Lighting projects.

Digging Machine Operator: All other digging equipment and augering on Traffic Signal/Lighting projects.

A Groundman/Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator/equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only.

Per hour: 07/01/2024

Group A:	
Lineman, Technician	\$ 50.54
Crane, Crawler Backhoe	50.54
Certified Welder	53.07

Group B:

Digging Machine	45.49
Tractor Trailer Driver	42.96
Groundman, Truck Driver	40.43
Equipment Mechanic	40.43
Flagman	30.32

Above rates are applicable for installation, testing, operation, maintenance and repair on all Traffic Control (Signal) and Illumination (Lighting) projects, Traffic Monitoring Systems, and Road Weather Information Systems. Includes digging of holes for poles, anchors, footer foundations for electrical equipment; assembly of all electrical materials or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

SHIFT WORK

THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM	REGULAR RATE
2ND SHIFT	4:30 PM TO 1:00 AM	REGULAR RATE PLUS 17.3%
3RD SHIFT	12:30 AM TO 9:00 AM	REGULAR RATE PLUS 31.4%

SUPPLEMENTAL BENEFITS

Per hour worked:

07/01/2024

Group A \$ 30.90
 *plus 7% of the hourly wage paid

Group B \$ 26.90
 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE. NOTE: Double time for all emergency work designated by the Dept. of Jurisdiction. WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.
 Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyworker's Lineman wage.

1st	2nd	3rd	4th	5th	6th	7th
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS per hour:

07/01/2024

\$ 26.90
 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249a-LT

Lineman Electrician - Tree Trimmer

07/01/2024

JOB DESCRIPTION Lineman Electrician - Tree Trimmer
ENTIRE COUNTIES

DISTRICT 6

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

WAGES

Applies to line clearance, tree work and right-of-way preparation on all new or existing energized overhead or underground electrical, telephone and CATV lines. This also includes stump removal near underground energized electrical lines including telephone and CATV lines.

Per hour:	07/01/2024
Tree Trimmer	\$ 31.44
Equipment Operator	27.80
Equipment Mechanic	27.80
Truck Driver	23.15
Groundman	19.07
Flag person	15.00*

*NOTE-Rate effective on 01/01/2025 - \$15.50 due to minimum wage increase.

SUPPLEMENTAL BENEFITS

Per hour:	07/01/2024
Journeyworker	\$ 10.48 *plus 4.5% of the hourly wage paid

* The 4.5% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (5, 6, 8, 15) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 15, 16, 25) on HOLIDAY PAGE

NOTE: All paid holidays falling on a Saturday shall be observed on the preceding Friday. All paid holidays falling on a Sunday shall be observed on the following Monday.

6-1249TT

Mason - Building **07/01/2024**

JOB DESCRIPTION Mason - Building **DISTRICT 3**

ENTIRE COUNTIES

Erie, Niagara

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour:	07/01/2024	04/01/2025 Additional
Plasterer	\$ 32.55	\$ 1.50

Additional \$3.00/hr for work on swing stage over 20 feet.

SUPPLEMENTAL BENEFITS

Per hour:	\$ 24.09
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OVERTIME PAY

Exterior work only See (B, E, E2, Q) on OVERTIME PAGE.
 All other work See (B, E, Q) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following dollar amounts:
07/01/2024

0-2000	\$ 20.00
2000-4000	\$ 22.00
4000-6000	\$ 24.00
6000-8000	\$ 26.00

Supplemental benefits per hour:

Hour terms at the following dollar amounts:

0-2000	\$ 3.00
2000-4000	\$ 4.00
4000-8000	\$ 5.00

3-9-Pltr

Mason - Building

07/01/2024

JOB DESCRIPTION Mason - Building

DISTRICT 5

ENTIRE COUNTIES

Erie, Niagara

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per Hour:	07/01/2024
Building:	
Bricklayer	\$ 37.44
Stone Mason	37.44
Tuck Pointer	37.44

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 33.14
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OVERTIME PAY

See (B,E,E2*,Q) on OVERTIME PAGE

*Note - Or other conditions beyond the employer's control such as fire or natural disaster.

HOLIDAY

Paid:	See (1) on HOLIDAY PAGE
Overtime:	See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1250 hour terms at the following wage:

1st	2nd	3rd	4th
\$ 28.77	\$ 29.50	\$ 31.61	\$ 34.59

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$ 13.48	\$ 19.83	\$ 24.80	\$ 28.91

5-3B-Z3

Mason - Building / Heavy&Highway

07/01/2024

JOB DESCRIPTION Mason - Building / Heavy&Highway

DISTRICT 3

ENTIRE COUNTIES

Niagara

WAGES

Per hour:	07/01/2024
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Cement Mason \$ 33.00

Additional \$0.50 per hr for Swing scaffold or exterior scaffold 42' or higher.
Additional \$1.00 per hr when required to wear personal protective equipment including suit and/or respirator.

SUPPLEMENTAL BENEFITS

Per hour: \$ 35.92

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following dollar amounts:

1st	2nd	3rd	4th	5th	6th
\$ 19.80	\$ 21.45	\$ 23.10	\$ 24.75	\$ 26.40	\$ 28.05

Supplemental benefits per hour:

1st	2nd	3rd	4th	5th	6th
\$ 9.11	\$ 11.96	\$ 11.99	\$ 15.26	\$ 17.45	\$ 20.82

3-111Niag

Mason - Heavy&Highway

07/01/2024

JOB DESCRIPTION Mason - Heavy&Highway

DISTRICT 5

ENTIRE COUNTIES

Allegany, Broome, Chautauqua, Chemung, Chenango, Cortland, Delaware, Genesee, Livingston, Monroe, Ontario, Orleans, Otsego, Schuyler, Seneca, Steuben, Tioga, Tompkins, Wayne, Wyoming, Yates

PARTIAL COUNTIES

Cattaraugus: Entire county except in the Township of Perrysburg and the Village of Gowanda only the Bricklayer classification applies.
Erie: Only the Bricklayer classification applies.
Niagara: Only the Bricklayer classification applies.

WAGES

Per hour: 07/01/2024
Heavy & Highway:
Cement Mason \$ 37.88
Bricklayer 37.88

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 24.53

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1500 hour terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
50%	60%	70%	80%

Supplemental benefits per hour:

1st term	\$ 14.53
2nd term	\$ 23.57
3rd term	\$ 23.81

4th term \$ 24.05

5-3h

Mason - Tile Finisher

07/01/2024

JOB DESCRIPTION Mason - Tile Finisher

DISTRICT 5

ENTIRE COUNTIES

Erie, Niagara, Orleans

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour: 07/01/2024

Building:

Marble, Slate, Terrazzo and Tile Finisher \$ 34.71

SUPPLEMENTAL BENEFITS

Per hour: \$ 17.97

OVERTIME PAY

See (B,E,E2*,Q) on OVERTIME PAGE

*Note - Or other conditions beyond the employer's control such as fire or natural disaster.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1200 hours 1st and 2nd term and 1300 hours 3rd term at the following wage:

1st	2nd	3rd
\$ 21.97	\$ 25.04	\$ 28.42

Supplemental benefits per hour:

1st	2nd	3rd
\$ 9.54	\$ 11.76	\$ 13.67

5-3TF - Z3

Mason - Tile Setter

07/01/2024

JOB DESCRIPTION Mason - Tile Setter

DISTRICT 5

ENTIRE COUNTIES

Erie, Niagara, Orleans

PARTIAL COUNTIES

Cattaraugus: Only in the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour: 07/01/2024

Building:

Marble, Slate, Terrazzo and Tile Setter \$ 37.85

SUPPLEMENTAL BENEFITS

Per hour: \$ 32.23

OVERTIME PAY

See (B,E,E2*,Q) on OVERTIME PAGE

*Note - Or other conditions beyond the employer's control such as fire or natural disaster.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1250 hour terms at the following wage:

1st	2nd	3rd	4th
\$ 28.88	\$ 29.60	\$ 31.52	\$ 35.24

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$ 13.07	\$ 19.38	\$ 24.49	\$ 27.81

5-3TS - Z3

Millwright

07/01/2024

JOB DESCRIPTION Millwright

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

WAGES

THE FOLLOWING RATE APPLIES TO ANY GAS/STEAM TURBINE AND OR RELATED COMPONENT WORK, INCLUDING NEW INSTALLATIONS OR MAINTENANCE AND ANY/ALL WORK PERFORMED WITHIN THE PROPERTY LIMITS OF A NUCLEAR FACILITY.

Per hour:	07/01/2024	07/01/2025
		Additional
Millwright - Power Generation	\$ 45.00	\$2.50*

* To be allocated at a later date.

NOTE: ADDITIONAL PREMIUMS PAID FOR THE FOLLOWING WORK LISTED BELOW (amount subject to any overtime premiums):

- Certified Welders shall receive an additional \$1.75 per hour provided they are directed to perform Certified Welding.
- If a work site has been declared a hazardous site by the Owner and the use of protective gear (including, as a minimum, air purifying canister-type chemical respirators) is required, then that employee shall receive an additional \$1.50 per hour.
- An employee performing the work of a machinist shall receive an additional \$2.00 per hour. For the purposes of this premium to apply, a "machinist" is a person who uses a lathe, Bridgeport, milling machine or similar type of tool to make or modify parts.
- When performing work underground at 500 feet and below, the employee shall receive an additional \$1.00 per hour.

SUPPLEMENTAL BENEFITS

Per hour paid:

Journeyworker	\$ 27.95*
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*NOTE: Subject to OT premium

OVERTIME PAY

See (B, E, E2, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

NOTE: Any holiday that falls on Sunday shall be observed the following Monday. Any holiday that falls on Saturday shall be observed the preceding Friday.

REGISTERED APPRENTICES

WAGES per hour: One year terms at the following percentage of Journeyworker's wage:

Appr. 1st year	65 %*
Appr. 2nd year	75 %*
Appr. 3rd year	80 %*
Appr. 4th year	90 %*

*NOTE: Additional premium for the following work listed below:

Certified Welder	\$ 1.75
Hazardous Waste Work	1.50
Machinist	2.00
Underground (500' and below)	1.00

SUPPLEMENTAL BENEFITS per hour:

Appr. 1st year	\$ 11.89
Appr. 2nd year	23.14
Appr. 3rd year	24.74
Appr. 4th year	26.35

6-1163Power

Millwright

07/01/2024

JOB DESCRIPTION Millwright

DISTRICT 12

ENTIRE COUNTIES
 Erie, Genesee, Niagara

WAGES

Per hour: 07/01/2024

Building	\$ 40.53
Heavy & Highway*	\$ 44.03

*All Heavy & Highway Millwright construction will be paid at the rate indicated above. H/H work performed on hazardous waste sites where employees are required to wear protective gear shall receive an additional \$2.00 per hour over the Millwright H/H rate for all hours worked on the day protective gear was worn.

NOTE ADDITIONAL PREMIUMS PAID FOR THE FOLLOWING WORK LISTED BELOW (amount subject to any overtime premiums):

- Certified Welders shall receive \$1.75 per hour in addition to the current Millwright's rate provided he/she is directed to perform certified welding.
- If a building work site has been declared a hazardous site by the Owner and the use of protective gear (including, as a minimum, air purifying canister-type chemical respirators) are required, then that employee shall receive a \$1.50 premium per hour.
- An employee performing the work of a machinist shall receive \$2.00 per hour in addition to the current Building & Heavy Millwright's rate. For the purposes of this premium to apply, a "machinist" is a person who uses a lathe, Bridgeport, milling machine or similar type of tool to make or modify parts.
- When performing work underground at 500 feet and below, the employee shall receive an additional \$1.00 per hour.

SUPPLEMENTAL BENEFITS

Per hour Paid:

All Classifications	\$ 31.49
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OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1300 hour terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
65%	75%	80%	90%

Supplemental Benefits per hour worked:

1st	2nd	3rd	4th
\$11.89	\$ 25.61	\$ 27.57	\$ 29.53

12-1163-Gen/Nia/Orl/Wyo

Operating Engineer

07/01/2024

JOB DESCRIPTION Operating Engineer

DISTRICT 12

ENTIRE COUNTIES
 Cattaraugus, Chautauqua, Erie, Niagara, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: The portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

Per Hour:	7/01/2024	01/01/2025
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Concrete Pump	\$46.00	\$47.38
ADDITIONAL:		
Pumps from		
46-65 meters	\$3.00/HR	\$4.25/HR
Hazardous Work Site	\$2.50/HR	\$2.50/HR
SUPPLEMENTAL BENEFITS		
Per Hour:	\$32.00*	\$33.10*

PLEASE NOTE BELOW IN OVERTIME.

OVERTIME PAY

See (B, Q, *V) on OVERTIME PAGE

* \$1.90 of above benefit amount is for every hour paid.

* 07/01/2024 \$7.05 of above benefit amount is calculated at Same Premium

* 01/01/2025 \$7.30 of above benefit amount is calculated at Same Premium

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

12-17Pump

Operating Engineer - Building

07/01/2024

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 12

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Niagara, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

CLASS A: Air Hoist, All Boom Type Equipment, All Pans and Carry-Alls, Archer Hoist, Asphalt Curb and Gutter Machines, Asphalt Roller, Asphalt Spreader or Paver, Automatic Fine Grade Machine (CMI or similar, first and second operator), Backhoe and Pullhoe, Backhoe and Pullhoe (tractor mounted, rubber tired), Back Filling Machine, Belt Placer (CMI or similar type), Bending Machine (Pipe), Bituminous Spreader and Mixer, Blacktop Plants (Automated and Non-automated), Blast or Rotary Drill (Truck or Track Mounted), Blower for Burning Brush, Boiler (when used for power), Boom Truck (excluding pick-up and delivery), Boring Machine, Bulldozer, Cableway, Cage Hoist, Caisson Auger, Central Mix Plant (and all concrete batching plants), Cherry Picker, Concrete Cleaning Decontamination Machine Operator, Concrete Curb and Gutter Machine, Concrete Curing Machine, Concrete Cutters (Vermeer or Similar Type), Concrete Mixer (over 1/2 cu yd.), Concrete Pavement Spreaders and Finishers, Concrete Paver, Conveyor, Core Drill, Crane, Crusher, Decon of Equipment, Derrick, Dragline, Dredge, Drill Rig (Tractor Mounted), Dual Drum Paver, Electric Pump used in conjunction with Well Point Systems, Elevating Grader (self propelled or towed), Elevator, Excavator (all purpose, hydraulically operated), Farm Tractor with Accessories, Fine Grade Machine, Forklift, Front End Loader, Generator (10 outlets or more), Gradall, Grader, Grout or Guniting Machine, Head Tower, Heavy Equipment Robotics Operator/Mechanic, Helicopter (when used for hoisting), Hoist (one drum), Hoisting Engine, Horizontal Directional Drill Locator, Horizontal Directional Drill Operator, Hydraulic Boom, Hydraulic Hammer (self-propelled), Hydraulic Pipe Jack Machine (or similar type machine), Hydraulic Rock Expander (or similar type machine), Hydraulic System Pumps, Hydro Crane, Hydro Hammer (or similar type), Industrial Tractor, Jersey Spreader, Kolman Plant Loader (and similar type loaders), Laser Screed, Locomotive, Lubrication Truck, Maintenance Engineer, Maintenance, Lubrication Unit or Truck, Mine Hoist, Mixer for Stabilized Base (self-propelled), Monorail, Motorized Hydraulic Pin Puller, Motorized Hydraulic Seeder, Mucking Machine, Mulching Machine, Multiple Drum Hoist (more than one drum in use), Overhead Crane, Peine Crane (or similar type), Pile Driver, Plant Engineer, Pneumatic Mixer, Post Hole Digger and Driver, Power Broom, Pumpcrete, Push Button Hoist, Push or Snatch Cat, Quarry Master or equivalent, Road Widener, Rock Bit Sharpener (all types), Roller (all), Rolling Machine (pipe), Rotomill, Scissors Trucks, Lift, or Boom Lift of any type (when used for hoisting), Scoopmobile, Shovel, Sideboom, Skidsteer/Bobcat (Similar Type), Skimmer, Slip Form Paver (CMI or similar type), Snorkel/Vacuum Truck, Strato-Tower, Stump Chipping Machine, Tire Truck and Drivers performing tire repair (exclude outside vendor), Towed Roller, Tractor Drawn Belt-Type Grader/Loader, Tractor Shovel, Tractor with Towed Accessories, Tractor (when using winch power), Tractors, Trencher, Truck Crane, Truck Mechanic and Helper (exclude Teamsters when repairing their own trucks), Tunnel Shovel, Tube Finisher (CMI and similar type), Ultra High Pressure Waterjet Cutting Tool System Operator/Mechanic, Vacuum Blasting Machine Operator/Mechanic, Vibratory Compactor, Vibro Tamp, Well Drilling Machine, Well Point, Winch, Winch Truck with A Frame.

CLASS B: Aggregate Bin, Aggregate Plant, Apprentice Engineer, Apprentice Engineer Driver, Articulated Off Road Material Hauler, Boiler (used in conjunction with production), CMI and similar type Concrete Spreads (Apprentice Engineer), Cement Bin, Chipping Machine and Chip Spreader, Compressors (4 or less), Compressors (any size, but subject to other provisions for Compressors, Dust Collectors, Generators, Mechanical Heaters, Pumps, Welding Machines - four of any type or combination), Concrete Mixer (1/2 cu. yd. and under), Fireman, Form Tamper, Form Trucks (excluding Teamster or delivery), Fuel Truck or Drivers (exclude Teamster or delivery), Heaters, Heating Boiler (used for temporary heat), Helper on Lubrication Unit or Truck, Jeep Trencher, Power Heaterman, Power Plant in excess of 10 K.W., Pumps, Revinus Widener, Steam Boilers (if manning or license by local law is required), Steam Cleaner (when used for cleaning equipment on the job site), Welding Machine (1 machine over 300 amps or 2 or 3 machines regardless of amps).

Operating Engineer- Building:

Per hour:	07/01/2024
Class A	\$ 43.00
Class B	38.34
Crane(Up to 60 Tons)	46.00
" (61 to 199 Tons)	47.00
" (200 to 399 Tons)	47.50
" (400 Tons or more)	48.00

Additional \$5.00/hr. for Any Tower Crane
 Additional \$2.50/hr. for Hazardous Work Site
 Additional \$1.00/hr. for Tunnel Work
 Additional \$2.25/hr. for Agency Mandated Shift Work

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyman \$ 34.35**

**Note: For Overtime Hours \$25.40 of this amount is paid a straight time, the remaining balance of \$8.95 is paid at the same premium as the wage.

OVERTIME PAY

See (B, E, *E2, P, V) on OVERTIME PAGE

* Only Saturdays between October 15th and April 15th.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1 year Terms

1st	2nd	3rd	4th
\$ 32.40	\$ 33.32	\$ 34.24	\$ 35.16

Supplemental benefits Per Hour:

All Apprentices \$ 33.45**

**Note: For Overtime Hours \$25.40 of this amount to be paid a straight time rate remaining balance of \$8.05 is paid at same premium as the wage.

12-17b

Operating Engineer - Heavy&Highway **07/01/2024**

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 12

ENTIRE COUNTIES

Chautauqua, Erie, Niagara, Orleans

WAGES

Marine Construction/Dredging

Class 1: Diver/Wet Tender, Engineer, Engineer(hydraulic dredge), Blaster.

Class 2(A): Crane, Backhoe Operator, Material Handler, ALL Self-propelled Drill Rigs, Mechanic/Welder, Asst. Engineer(hydraulic dredge), Leverman(hydraulic dredge), Diver/Dry Tender.

Class 2(B): Friction, Lattice Boom, or Crane License Certificate, Endorse Tug or Tow Boat Operator.

Class 3: Deck Equipment Operator, (Machineryman), Maintenance of Crane, Tug/Launch Operator, Loader/Dozer on Barge.

Class 4: Deck Equipment Operator and Machinery Man/Fireman on 4 equipment units or more, Off Road Trucks, Deck Hand, Tug Engineer, Crane Maintenance (50 tons and under/ backhoe 115,000lbs or less), Asst. Tug Operator, Blaster Helper.

Per hour: 07/01/2024

Class 1	\$ 51.50
Class 2(A)	50.00
Class 2(B)	53.00
Class 3	44.45

Class 4 41.00

Hazardous/Toxic Waste based on EAP Levels

- Additional:
- Level A - \$2.50/Hr.
- Level B - 2.00/Hr.
- Level C - 1.00/Hr.
- Level D - 0.50/Hr.

SUPPLEMENTAL BENEFITS

Per Hour Paid:

ALL CLASSES \$ 36.86

OVERTIME PAY

See (B, E, I, *S) on OVERTIME PAGE

* If the Holiday is Worked

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE

12-17 Marine

Operating Engineer - Heavy&Highway

07/01/2024

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 12

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Niagara, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

CLASS A: Air Hoist, All Boom Type Equipment, All Pans and Carry-All's, Asphalt Curb and Cutter Machines, Asphalt Roller, Asphalt Spreader or Paver, Automatic Fine Grade Machine (CMI or similar, first and second operator), Backhoe and Pullhoe (all), Back Filling Machine, Belt Placer (CMI or similar type), Bending Machine (pipe), Bituminous Spreader and Mixer, Blacktop Plant (all), Blast or Rotary Drill (Truck or Track Mounted), Blower for Burning Brush, Boiler (when used for power), Boom Truck, Boring Machine, Bulldozer, Cableway, Cage Hoist, Caisson Auger, Central Mix Plant (and all Concrete Batching Plants), Cherry Picker, Concrete Cleaning Decontamination Machine, Concrete Curb and Gutter Machine, Concrete Curing Machine, Concrete Mixer (over 1/2 cu. yd.), Concrete Pavement Spreaders and Finishers, Concrete Paver, Concrete Saw (self propelled), Conveyor, Convoing Vehicles Convoing Engineer's Equipment, Core Drill, Crane, Crusher, Decontamination of Equipment, Derrick, Dragline, Dredge, Drill Rig (Tractor Mounted), Dual Drum Paver, Electric Pump used in conjunction with Well Point Systems, Elevating Grader (self propelled or towed), Elevator, Excavator (all purpose, hydraulically operated), Farm Tractor with Accessories, Fine Grade Machine, Forklift, Front End Loader, Gradall, Grader, Grout or Guniting Machine, Head Tower, Heavy Equipment Robotics Operator/Mechanic, Hoist (all types), Hoisting Engine, Horizontal Directional Drill Locator, Horizontal Directional Drill Operator, Hydraulic Boom, Hydraulic Hammer (self propelled), Hydraulic Pipe Jack Machine, (or similar type machine), Hydraulic Rock Expander (or similar type machine), Hydraulic System Pumps, Industrial Tractor, Jersey Spreader, Kolman Plant Loader (and similar type Loaders), Laser Screed, Locomotive, Log Skidder (similar type), Maintenance Engineer, Maintenance, Lubrication Unit or Truck, Mine Hoist, Mixer for Stabilized Base (self propelled), Monorail, Motorized Hydraulic Pin Puller, Motorized Hydraulic Seeder, Mucking Machine, Mulching Machine, Overhead Crane, Parts Chasing, Peine Crane (or similar type), Pile Driver, Plant Engineer, Pneumatic Mixer, Post Hole Digger and Post Driver, Power Broom, Pump Crete, Push Button Hoist, Push or Snatch Cat, Quarry Master (or equivalent), Road Widener, Rock Bit Sharpener (all types), Roller (all), Rolling Machine (Pipe), Rotomill, Scoopmobile, Shovel, Side Boom, Skidsteer/Bobcat (similar type), Skimmer, Slip Form Paver (CMI or similar, first and second operator), Snorkel/Vacuum Truck, Strato-Tower, Tire Truck & Repair, Towed Roller, Tractor Drawn Belt-Type Grader/Loader, Tractor Shovel, Tractor with Towed Accessories, Tractors (when using winch power), Trencher, Truck Crane, Tug Boats, Tunnel Shovel, Tube Finisher (CMI and similar), Vacuum Blasting Machine Operator/Mechanic, Vibratory Compactor, Vibro Tamp, Waterjet Cutting Tool System Operator/Mechanic (Ultra High Pressure), Well Drilling Machine, Well Point, Winch, Winch Truck with A Frame.

CLASS B: Aggregate Bin, Aggregate Plant, Apprentice Engineer, Apprentice Engineer Driver, Articulated Off Road Material Hauler, CMI and similar type Concrete Spreads (Apprentice Engineer), Cement Bin, Chipping Machine and Chip Spreader, Compressors (4 or less), Compressors: any size, but subject to other provisions for Compressors, Dust Collectors, Mechanical Heaters, Pumps, Welding Machines (four of any type or combination), Concrete Mixer (1/2 cu. yd. and under), Fireman, Form Tamper, Fuel Truck, Heating Boiler (used for temporary heat), Helper on Lubrication Unit or Truck, Jeep Trencher, Power Heaterman, Power Plant in excess of 10 K.W., Pumps (4" or over), Revinius Widener, Steam Cleaner, Stump Chipping Machine, Welding Machine (1 machine over 300 amps or 2 or 3 machines regardless of amps).

Operating Engineer- Heavy & Highway, Sewer (includes cleaning, lining & rehab), Water & Tunnel

Per hour:	07/01/2024
Class A	\$ 43.39
Class B	38.89
Crane 5 to 60 tons	46.39

" 61 to 199 tons	46.89
" 200 to 399 tons	47.39
" 400 and over	47.89

Additional \$2.50/hr. for Hazardous Work Site
 Additional \$1.00/hr. for Tunnel Work
 Additional \$4.00/hr. for Agency Mandated Off-Shift Work

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 35.96*

*Note: For Overtime Hours \$19.40 of the amount paid at straight time, the remaining balance of 16.56 is paid at the same premium as the wage.
 Overtime rate is 1.5 x base rate plus 9.68. Double time rate is 2 x base rate plus 19.35

OVERTIME PAY

See (B, E, Q, W) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

*Saturday Holidays will be recognized on the Friday before
 **Sunday Holidays will be recognized on the Monday after

REGISTERED APPRENTICES

Wages per hour:

Apprentices at 1 year terms

1st	2nd	3rd	4th
\$35.89	\$36.89	\$37.89	\$38.89

Supplemental Benefits

All Apprentices \$ 35.56*

*Note: For Overtime Hours \$19.40 of the amount paid at straight time, the Remaining balance of \$16.06 is paid at same premium as the wage. Overtime rate is 1.5 x base rate plus 9.68. Double time rate is 2 x base rate plus 19.35

12-17 hh/sw/t

Operating Engineer - Survey Crew

07/01/2024

JOB DESCRIPTION Operating Engineer - Survey Crew

DISTRICT 12

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Niagara, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

These rates apply to Building, Heavy and Highway Construction.

Per hour:

SURVEY CLASSIFICATIONS:

Party Chief - One who directs a survey party.
 Instrument Person - One who operates the surveying instruments.
 Rod Person - One who holds the rods and assists the Instrument Person.

07/01/2024

Party Chief	\$ 49.40
Instrument Person	46.62
Rod Person	32.52

Additional \$3.00 per hr. for work in a Tunnel.
 Additional \$2.50 per hr. for EPA or DEC certified toxic or hazardous waste work.

SUPPLEMENTAL BENEFITS

Per hour worked:

Journeyman \$ 30.80

OVERTIME PAY

See (B, E, Q, *V, X) on OVERTIME PAGE

*Note: \$27.65 Only for "ALL" premium hours paid.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES: 1000 hour terms based on the Percentage of Rod Person wage:

07/01/2024

0-1000 Hrs	60%
1001-2000 Hrs	70%
2001-3000 Hrs	80%

SUPPLEMENTAL BENEFITS per hour worked:

0-1000 Hrs	\$ 20.07/ PHP \$14.79
1001-2000 Hrs	22.85 / 17.01
2001-3000 Hrs	25.62 / 19.62

NOTE: PHP is premium hours paid when worked.

12-17D Sur

Operating Engineer - Survey Crew - Consulting Engineer

07/01/2024

JOB DESCRIPTION Operating Engineer - Survey Crew - Consulting Engineer

DISTRICT 12

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Niagara, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

These rates apply to feasibility and preliminary design surveying, line of grade surveying for inspection or supervision of construction when performed under a Consulting Engineer Agreement.

Per hour:

SURVEY CLASSIFICATIONS:

Party Chief - One who directs a survey party.

Instrument Person - One who operates the surveying instruments.

Rod Person - One who holds the rods and assists the Instrument Person.

07/01/2024

Party Chief	\$ 48.90
Instrument Person	46.12
Rod Person	32.02

SUPPLEMENTAL BENEFITS

Per hour worked:

Journeyman	\$ 31.30
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OVERTIME PAY

See (B, E, Q, *V, X) on OVERTIME PAGE

*Note: \$24.75 Only for "ALL" premium hours paid.

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES: 1000 hour terms based on the Percentage of Rod Persons Wage:

07/01/2024

0-1000	60%
1001-2000	70%
2001-3000	80%

SUPPLEMENTAL BENEFITS per hour worked:

0-1000	\$ 20.07 / PHP \$14.79
1001-2000	22.85/ " 17.01
2001-3000	25.62 / " 19.62

NOTE: PHP is premium hours paid.

12-17D Con Eng

Painter

07/01/2024

JOB DESCRIPTION Painter

DISTRICT 3

ENTIRE COUNTIES

Allegany, Erie, Genesee, Niagara, Orleans, Wyoming

PARTIAL COUNTIES

Cattaraugus: Entire County except the Townships of Conewango, Leon, Napoli, New Albion, Randolph and South Valley.

Chautauqua: Only the Townships of Awkright, Dunkirk, Hanover, Pomfret, Portland, Sheridan and Villenova.

Livingston: Only the Townships of North Dansville, Nunda, Ossian,Portage, Sparta, Spring Water and West Sparta.

Steuben: Only the Townships of Avoca, Canisteo, Cohocton, Dansville, Fremont, Greenwood, Hartsville, Hornellsville, Howard, Jasper, Prattsburg, Pulteney, Troupsburg, Tuscarora, Urbana, Wayland, Wayne, Woodhull, West Union, Wheeler, and the City of Hornell.

WAGES

Per hour: 07/01/2024

Basic Rate (Brush & Roll)	\$ 31.37
Spray painting, wallcovering	31.37
Abrasive and hydroblasting	31.37
Taping/DryWall Finisher	32.86
Skeleton Steel*	32.12

* Skeleton Steel: No floors, walls or ceiling are constructed, including radio and television towers, flagpoles, smokestacks and cranes.

SUPPLEMENTAL BENEFITS

Per hour:

Basic Rate (Brush & Roll)	
Spray painting, wallcovering	
Abrasive and hydroblasting and	
Skeleton Steel	\$ 28.21

Taping/Drywall Finisher	\$ 27.82
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OVERTIME PAY

Exterior work only See (B, E4, F*, R) on OVERTIME PAGE.

All other work See (B, F*, R) on OVERTIME PAGE.

* Note - Saturday is payable at straight time if the employee misses work, except where a doctor's or hospital verification of illness is produced Monday through Friday when work was available to the employee.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Painter/Decorator: 750 hour terms at the following wage:

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 18.00	\$ 19.00	\$ 20.00	\$ 21.00	\$ 22.00	\$ 23.00	\$ 24.00	\$ 25.00

Taper/Drywall Finisher: 750 hour terms at the following wage:

1st	2nd	3rd	4th	5th	6th
\$ 20.00	\$ 21.00	\$ 22.00	\$ 23.00	\$ 24.00	\$ 25.00

Supplemental benefits per hour:

Painter/Decorator and Taper/Drywall Finisher:

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 3.35	\$ 5.35	\$ 6.35	\$ 6.85	\$ 7.35	\$ 7.85	\$ 8.35	\$ 8.60

3-4-Buf, Nia, Olean

Painter

07/01/2024

JOB DESCRIPTION Painter

DISTRICT 3

ENTIRE COUNTIES

Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Cortland, Delaware, Erie, Genesee, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Schuyler, Seneca, St. Lawrence, Steuben, Tioga, Tompkins, Wayne, Wyoming, Yates

WAGES

Per hour: 07/01/2024

Bridge	\$ 43.81
Tunnel	43.81
Tank*	41.81

For Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter's Rate; the contract must be ONLY for Bridge Painting.

Tank rate applies to indoor and outdoor tanks, tank towers, standpipes, digesters, waste water treatment tanks, chlorinator tanks, etc. Covers all types of tanks including but not limited to steel tanks, concrete tanks, fiberglass tanks, etc.

SHIFT WORK

Note an additional \$1.50 per hour is required when the contracting agency or project specification requires any shift to start prior to 6:00am or after 12:00 noon.

SUPPLEMENTAL BENEFITS

Per hour: \$ 31.39

OVERTIME PAY

Exterior work only See (B, E4, F*, R) on OVERTIME PAGE.
 All other work See (B, F*, R) on OVERTIME PAGE.

*Note - Saturday is payable at straight time if the employee misses work, except where a doctor's or hospital verification of illness is produced Monday through Friday when work was available to the employee.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following wage:

1st	2nd	3rd	4th	5th	6th
\$ 24.00	\$ 26.00	\$ 28.00	\$ 30.00	\$ 34.00	\$ 38.00

Supplemental benefits per hour:

1st	2nd	3rd	4th	5th	6th
\$ 6.60	\$ 6.95	\$ 7.30	\$ 7.65	\$ 8.00	\$ 8.35

3-4-Bridge, Tunnel, Tank

Painter - Metal Polisher

07/01/2024

JOB DESCRIPTION Painter - Metal Polisher

DISTRICT 8

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

	07/01/2024
Metal Polisher	\$ 39.33
Metal Polisher*	40.43
Metal Polisher**	43.33

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2024

Journeyworker:	
All classification	\$ 12.79

OVERTIME PAY

See (B, E, P, T) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year term at the following wage rates:

07/01/2024

1st year	\$ 19.67
2nd year	21.63
3rd year	23.60
1st year*	\$ 22.06
2nd year*	22.07
3rd year*	24.14
1st year**	\$ 22.17
2nd year**	24.13
3rd year**	26.10

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

Supplemental benefits:

Per hour:

1st year	\$ 8.69
2nd year	8.69
3rd year	8.69

8-8A/28A-MP

Plumber

07/01/2024

JOB DESCRIPTION Plumber

DISTRICT 3

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Niagara, Wyoming

PARTIAL COUNTIES

Allegany: Only the Townships of Allen, Alma, Amity, Angelica, Belfast, Bolivar, Caneadea, Centerville, Clarksville, Cuba, Genesee, Friendship, Granger, Hume, New Hudson, Rushford, Wirt and that portion of Scio which lies west of Rt. 19.

Genesee: Only the Townships of Alabama, Alexander, Batavia, Darien, Elba, Oakfield, Pembroke and the City of Batavia.

Orleans: Only the Townships of Ridgeway, Shelby and Yates.

WAGES

Per hour: 07/01/2024

Plumber	\$ 41.33
Steamfitter	\$ 41.33

Note - Add 10% (ten percent) to wage when HAZMAT training is required or when OSHA compliant respirator protection is required.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 29.91

Note - \$6.00 of this amount must be paid at the same premium as the wage.

OVERTIME PAY

See (*B, **E, Q) on OVERTIME PAGE

* Double time after 11 hours per day on Weekdays.

** Double time after 10 hours per day on Saturday.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th	5th
50%	60%	70%	75%	90%

Note - Add 10% (ten-percent) to wage when HAZMAT training is required or when OSHA compliant respirator protection is required.

Supplemental benefits per hour:

\$ 24.99

Note - \$6.00 of this amount must be paid at the same premium as the wage.

3-22-P

Roofer **07/01/2024**

JOB DESCRIPTION Roofer

DISTRICT 3

ENTIRE COUNTIES

Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour: 07/01/2024

Asbestos Removal	\$ 37.96
Slate, Tile	35.11
Precast tile / slabs	35.11
Crete / gypsum planks	35.11
Damp and waterproofer	34.96
Composition, sprayers,	34.96
Asphalt mastic,	34.96
Steep roofers	34.96

SHIFT WORK

When shift work is mandated either in the job specification or by the contracting agency the following premiums apply:

15.0% for work from 4:30PM - 1:00AM or second shift

20.0% for work from 12:30AM - 9:00AM or third shift

SUPPLEMENTAL BENEFITS

Per hour: \$ 26.11

OVERTIME PAY

See (B, *E, **E2, Q) on OVERTIME PAGE

* and ** Double time after 8 hours on Saturday.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following percentage of Journeyman's wage:

0	to 999	to 1499	to 1999	to 2499	to 2999	to 3499	to 4499
	65%	70%	75%	80%	85%	90%	95%

Supplemental benefits per hour:

0	to 999	to 1499	to 1999	to 2499	to 2999	to 3499	to 4499
	\$ 10.96	\$ 15.14	\$ 15.39	\$ 23.22	\$ 23.94	\$ 24.66	\$ 25.39

3-74

Sheetmetal Worker **07/01/2024**

JOB DESCRIPTION Sheetmetal Worker

DISTRICT 3

ENTIRE COUNTIES

Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour: 07/01/2024

Sheet Metal Worker	\$ 39.50
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Additional \$0.50 per hour for work more than 30" above floor on boatswain chair.
Additional \$1.00 per hour for work in "Hot" areas of atomic laboratories, atomic plants, or any premises where radio-active materials are stored or handled and personal protective equipment is required.
Additional \$1.00 per hour for work when required to have 40-hour HAZMAT training or the use of OSHA compliant respirator is required.

SHIFT WORK

When shift work is mandated either in the job specification or by the contracting agency the following premiums apply:

Shift Premium per hour:

Second Shift	\$ 3.25
Third Shift	\$ 5.00

Registered Apprentices

When shift work is mandated either in the job specification or by the contracting agency the following premiums apply;

Shift Premium per hour:

Second Shift

1st term	\$ 1.46
2nd term	\$ 1.63
3rd term	\$ 1.79
4th term	\$ 2.28
5th term	\$ 2.60

Third Shift

1st term	\$ 2.25
2nd term	\$ 2.50
3rd term	\$ 2.75
4th term	\$ 3.50
5th term	\$ 4.00

SUPPLEMENTAL BENEFITS

Per hour:

\$ 29.18*

* Note - \$18.60 of this amount must be paid at the same premium as the wages per overtime hours.

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following wage:

1st term	\$ 20.73
2nd term	25.37
3rd term	28.02
4th term	29.65
5th term	32.94

Supplemental benefits per hour:

1st term	\$ 17.78	Note - \$8.20 of this amount must be paid at the same premium as the wage.
2nd term	21.79	Note - \$12.21 of this amount must be paid at the same premium as the wage.
3rd term	26.84	Note - \$16.26 of this amount must be paid at the same premium as the wage.
4th term	27.18	Note - \$16.60 of this amount must be paid at the same premium as the wage.
5th term	27.84	Note - \$17.26 of this amount must be paid at the same premium as the wage.

3-71

Sprinkler Fitter

07/01/2024

JOB DESCRIPTION Sprinkler Fitter

DISTRICT 1

ENTIRE COUNTIES

Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Tioga, Tompkins, Washington, Wayne, Wyoming, Yates

WAGES

Per hour 07/01/2024

Sprinkler \$ 42.00

Fitter

SUPPLEMENTAL BENEFITS

Per hour

Journeyworker \$ 28.82

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

Note: When a holiday falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double time rate. When a holiday falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double time rate.

REGISTERED APPRENTICES

Wages per hour

One Half Year terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 20.03	\$ 22.26	\$ 24.24	\$ 26.46	\$ 28.69	\$ 30.91	\$ 33.14	\$ 35.37	\$ 37.59	\$ 39.82

Supplemental Benefits per hour

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 9.18	\$ 9.18	\$ 20.90	\$ 20.90	\$ 21.15	\$ 21.15	\$ 21.15	\$ 21.15	\$ 21.15	\$ 21.15

1-669

Teamster - Building / Heavy&Highway 07/01/2024

JOB DESCRIPTION Teamster - Building / Heavy&Highway

DISTRICT 3

ENTIRE COUNTIES

Erie, Niagara

PARTIAL COUNTIES

Genesee: Only in the Townships of Alabama, Darien and Pembroke.

Orleans: Only the Townships of Ridgeway, Shelby and Yates.

Wyoming: Only in the Townships of Arcade, Bennington, Java and Sheldon.

WAGES

GROUP 1: Warehousemen, Yardmen, Truck Helpers, Pickups, Panel Trucks, Flatboy Material Trucks (straight jobs), Single Axle Dump Trucks, Dumpsters, Material Checkers and Receivers, Greasers, Truck Tiremen, Mechanics Helpers and Parts Chasers.

GROUP 2: Tandems and Batch Trucks, Mechanics, Dispatcher.

GROUP 3: Semi-Trailers, Low-Boy Trucks, Asphalt Distributor Trucks and Agitator, Mixer Trucks and dumpcrete type vehicles, Truck Mechanic, Fuel Trucks

GROUP 4: Specialized Earth Moving Equipment, Euclid type, or similar off-highway, where not self-loading, Straddle (Ross) Carrier, and self-contained concrete mobile truck.

GROUP 5: Off-highway Tandem Back-Dump, Twin Engine Equipment and Double-Hitched Equipment where not self-loading.

Per hour: 07/01/2024

All GROUPS \$ 45.98

Add \$2.00 when required to use personal protection when performing hazardous waste removal work.

SHIFT WORK

An additional \$4.00 per hour is required when a single irregular work shift starting any time from 3:30PM to 1:00AM is mandated either in the job specification or by the contracting agency.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 17.05*

*Note - Only \$ 8.50 per hour needs to be paid for overtime hours.

OVERTIME PAY

See (B, G, P) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

Teamster - Building / Heavy&Highway **07/01/2024**

JOB DESCRIPTION Teamster - Building / Heavy&Highway

DISTRICT 3

ENTIRE COUNTIES

Erie, Niagara

WAGES

Per hour: 07/01/2024
Dump Truck Operator* \$ 30.00

*Does not include Single Axle Dump Trucks (see Teamster Group 1).
*Does not include Off-highway Dump Trucks (see Teamster Groups 2-5).

SUPPLEMENTAL BENEFITS

Per hour:
\$ 2.02

OVERTIME PAY

See (B, B2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

3-449d-DT

Welder **07/01/2024**

JOB DESCRIPTION Welder

DISTRICT 1

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuylar, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour 07/01/2024

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY

HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

- (AA) Time and one half of the hourly rate after 7 and one half hours per day
- (A) Time and one half of the hourly rate after 7 hours per day
- (B) Time and one half of the hourly rate after 8 hours per day
- (B1) Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday.
Double the hourly rate for all additional hours
- (B2) Time and one half of the hourly rate after 40 hours per week
- (C) Double the hourly rate after 7 hours per day
- (C1) Double the hourly rate after 7 and one half hours per day
- (D) Double the hourly rate after 8 hours per day
- (D1) Double the hourly rate after 9 hours per day
- (E) Time and one half of the hourly rate on Saturday
- (E1) Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
- (E2) Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E3) Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
- (E4) Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E5) Double time after 8 hours on Saturdays
- (F) Time and one half of the hourly rate on Saturday and Sunday
- (G) Time and one half of the hourly rate on Saturday and Holidays
- (H) Time and one half of the hourly rate on Saturday, Sunday, and Holidays
- (I) Time and one half of the hourly rate on Sunday
- (J) Time and one half of the hourly rate on Sunday and Holidays
- (K) Time and one half of the hourly rate on Holidays
- (L) Double the hourly rate on Saturday
- (M) Double the hourly rate on Saturday and Sunday
- (N) Double the hourly rate on Saturday and Holidays
- (O) Double the hourly rate on Saturday, Sunday, and Holidays
- (P) Double the hourly rate on Sunday
- (Q) Double the hourly rate on Sunday and Holidays
- (R) Double the hourly rate on Holidays
- (S) Two and one half times the hourly rate for Holidays

- (S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.
- (T) Triple the hourly rate for Holidays
- (U) Four times the hourly rate for Holidays
- (V) Including benefits at SAME PREMIUM as shown for overtime
- (W) Time and one half for benefits on all overtime hours.
- (X) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

- (1) None
- (2) Labor Day
- (3) Memorial Day and Labor Day
- (4) Memorial Day and July 4th
- (5) Memorial Day, July 4th, and Labor Day
- (6) New Year's, Thanksgiving, and Christmas
- (7) Lincoln's Birthday, Washington's Birthday, and Veterans Day
- (8) Good Friday
- (9) Lincoln's Birthday
- (10) Washington's Birthday
- (11) Columbus Day
- (12) Election Day
- (13) Presidential Election Day
- (14) 1/2 Day on Presidential Election Day
- (15) Veterans Day
- (16) Day after Thanksgiving
- (17) July 4th
- (18) 1/2 Day before Christmas
- (19) 1/2 Day before New Years
- (20) Thanksgiving
- (21) New Year's Day
- (22) Christmas
- (23) Day before Christmas
- (24) Day before New Year's
- (25) Presidents' Day
- (26) Martin Luther King, Jr. Day
- (27) Memorial Day
- (28) Easter Sunday

(29) Juneteenth

**New York State Department of Labor - Bureau of Public Work
State Office Building Campus
Building 12 - Room 130
Albany, New York 12226**

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

This Form Must Be Typed

Submitted By:

(Check Only One) Contracting Agency Architect or Engineering Firm Public Work District Office Date: _____

A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address (Check if new or change)

Telephone _____ Fax _____

E-Mail: _____

2. NY State Units (see Item 5).

- | | |
|---|--|
| <input type="checkbox"/> 01 DOT | <input type="checkbox"/> 07 City |
| <input type="checkbox"/> 02 OGS | <input type="checkbox"/> 08 Local School District |
| <input type="checkbox"/> 03 Dormitory Authority | <input type="checkbox"/> 09 Special Local District, i.e.,
Fire, Sewer, Water District |
| <input type="checkbox"/> 04 State University
Construction Fund | <input type="checkbox"/> 10 Village |
| <input type="checkbox"/> 05 Mental Hygiene
Facilities Corp. | <input type="checkbox"/> 11 Town |
| <input type="checkbox"/> 06 OTHER N.Y. STATE UNIT | <input type="checkbox"/> 12 County |
| | <input type="checkbox"/> 13 Other Non-N.Y. State
(Describe) |

3. SEND REPLY TO (check if new or change)
Name and complete address: _____

Telephone _____ Fax _____

E-Mail: _____

4. SERVICE REQUIRED. Check appropriate box and provide project information.

- New Schedule of Wages and Supplements.
APPROXIMATE BID DATE : _____
- Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR
THIS PROJECT : _____

OFFICE USE ONLY

B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:

Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

1. New Building
2. Addition to Existing Structure
3. Heavy and Highway Construction (New and Repair)
4. New Sewer or Waterline
5. Other New Construction (Explain)
6. Other Reconstruction, Maintenance, Repair or Alteration
7. Demolition
8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- | | |
|--|---|
| <input type="checkbox"/> Construction (Building, Heavy
Highway/Sewer/Water) | <input type="checkbox"/> Fuel Delivery |
| <input type="checkbox"/> Tunnel | <input type="checkbox"/> Guards, Watchmen |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Janitors, Porters, Cleaners,
Elevator Operators |
| <input type="checkbox"/> Landscape Maintenance | <input type="checkbox"/> Moving furniture and
equipment |
| <input type="checkbox"/> Elevator maintenance | <input type="checkbox"/> Trash and refuse removal |
| <input type="checkbox"/> Exterminators, Fumigators | <input type="checkbox"/> Window cleaners |
| <input type="checkbox"/> Fire Safety Director, NYC Only | <input type="checkbox"/> Other (Describe) |

9. Does this project comply with the Wicks Law involving separate bidding? YES NO

10. Name and Title of Requester

Signature



NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

**LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE
AWARDED ANY PUBLIC WORK CONTRACT**

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

Debarment Database: To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: <https://apps.labor.ny.gov/EDList/searchPage.do>

For inquiries please call 518-457-5589.

NYSDOL Bureau of Public Work Debarment List 06/28/2024

Article 8

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	DOL	*****5754	0369 CONTRACTORS, LLC		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL	*****5784	A.J.M. TRUCKING, INC.		PO BOX 2064 MONROE NY 10950	02/12/2024	02/12/2029
DOL	AG	*****1812	ADVANCED BUILDERS & LAND DEVELOPMENT, INC.		400 OSER AVE #2300HAUPPAUGE NY 11788	09/11/2019	09/11/2024
DOL	NYC		ALL COUNTY SEWER & DRAIN, INC.		7 GREENFIELD DR WARWICK NY 10990	03/25/2022	03/25/2027
DOL	DOL	*****8387	AMERICAN PAVING & MASONRY, CORP.		8 FOREST AVE GLEN COVE NY 11542	05/24/2024	05/24/2029
DOL	DOL	*****8654	AMERICAN PAVING, INC.		8 FORREST AVE. GLEN COVE NY 11542	05/24/2024	05/24/2029
DOL	NYC		AMJED PARVEZ		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		ANGELO GARCIA		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL		ANGELO STANCO		8 FOREST AVE. GLEN COVE NY 11542	05/24/2024	05/24/2029
DOL	DOL		ANGELO TONDO		449 WEST MOMBASHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL	*****4231	ANKER'S ELECTRIC SERVICE, INC.		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	DOL		ANTHONY MONGELLI		PO BOX 2064 MONROE NY 10950	02/12/2024	02/12/2029
DOL	NYC		ARADCO CONSTRUCTION CORP		115-46 132RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL		ARNOLD A. PAOLINI		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC		ARSHAD MEHMOOD		168-42 88TH AVENUE JAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC		AVM CONSTRUCTION CORP		117-72 123RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	NYC		AZIDABEGUM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****8421	B & B DRYWALL, INC		206 WARREN AVE APT 1WHITE PLAINS NY 10603	12/14/2021	12/14/2026
DOL	DOL		B&L RENOVATION CO.		618 OCEAN PARKWAY APT A6BROOKLYN NY 11230	09/17/2020	09/17/2025
DOL	DOL		BERNARD BEGLEY		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	NYC	*****2113	BHW CONTRACTING, INC.		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL	*****3627	BJB CONSTRUCTION CORP.		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	DOL	*****5078	BLACK RIVER TREE REMOVAL, LLC		29807 ANDREWS ROAD BLACK RIVER NY 13032	10/17/2023	10/17/2028
DOL	DOL		BRADLEY J SCHUKA		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL	*****4083	C.P.D. ENTERPRISES, INC		P.O BOX 281 WALDEN NY 12586	03/03/2020	03/03/2025
DOL	DOL	*****5161	CALADRI DEVELOPMENT CORP.		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	DOL	*****3391	CALI ENTERPRISES, INC.		1223 PARK STREET PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL	*****4155	CASA BUILDERS, INC.	FRIEDLANDER CONSTRUCTION	64 N PUTT CONNERS ROAD NEW PALTZ NY 12561	05/10/2023	05/10/2028
DOL	AG	*****7247	CENTURY CONCRETE CORP		2375 RAYNOR ST RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	*****0026	CHANTICLEER CONSTRUCTION LLC		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	NYC	*****2117	CHARAN ELECTRICAL ENTERPRISES		9-11 40TH AVENUE LONG ISLAND CITY NY 11101	09/26/2023	09/26/2028

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DOL	NYC		CHARLES ZAHRADKA		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL		CHRISTOPHER GRECO		26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL		CRAIG JOHANSEN		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	DOL	****3228	CROSS-COUNTY LANDSCAPING AND TREE SERVICE, INC.	ROCKLAND TREE SERVICE	26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL	****7619	DANCO CONSTRUCTION UNLIMITED INC.		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL		DANIEL ROBERT MCNALLY		7 GREENFIELD DRIVE WARWICK NY 10990	03/25/2022	03/25/2027
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		DAVID FRIEDLANDER		64 NORTH PUTT CORNERS RD NEW PALTZ NY 12561	05/10/2023	05/10/2028
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL		DINA TAYLOR		64 N PUTT CONNERS RD NEW PALTZ NY 12561	05/10/2023	05/10/2028
DOL	DOL	****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	AG		EDWIN HUTZLER		23 NORTH HOWELLS RD BELLPORT NY 11713	08/04/2021	08/04/2026
DOL	DA		EDWIN HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	DOL		EUGENIUSZ "GINO" KUCHAR		195 KINGSLAND AVE BROOKLYN NY 11222	12/22/2023	12/22/2028
DOL	DA		FREDERICK HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	NYC	****6616	G & G MECHANICAL ENTERPRISES, LLC.		1936 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/29/2019	11/29/2024
DOL	DOL	****2998	G.E.M. AMERICAN CONSTRUCTION CORP.		195 KINGSLAND AVE BROOKLYN NY 11222	12/22/2023	12/22/2028
DOL	NYC		GAYATRI MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DA		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DA		GIOVANNA TRAVALJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	DA	****0213	GORILLA CONTRACTING GROUP, LLC		505 MANHATTAN AVE WEST BABYLON NY 11704	10/05/2023	10/05/2028
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL	****9211	J. WASE CONSTRUCTION CORP.		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		J.M.J CONSTRUCTION		151 OSTRANDER AVENUE SYRACUSE NY 13205	11/21/2022	11/21/2027
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	12/12/2022	12/12/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027

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DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JAMES J. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****7993	JBS DIRT, INC.		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL	*****2435	JEFFEL D. JOHNSON	JMJ7 AND SON	5553 CAIRNSTRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JEFFEL JOHNSON ELITE CARPENTER REMODEL AND CONSTRUCTION		C2 EVERGREEN CIRCLE LIVERPOOL NY 13090	11/21/2022	11/21/2027
DOL	DOL	*****2435	JEFFREY M. JOHNSON	JMJ7 AND SON	5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	NYC		JENNIFER GUERRERO		1936 HEMPSTEAD TURNPIKE EAST MEADOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		JIM PLAUGHER		17613 SANTE FE LINE ROAD WAYNEFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		JMJ7 & SON CONSTRUCTION, LLC		5553 CAIRNS TRAIL LIVERPOOL NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 AND SONS CONTRACTORS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS		7014 13TH AVENUE BROOKLYN NY 11228	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS AND SONS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS, LLC		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		JOHN MARKOVIC		47 MANDON TERRACE HAWTHORN NJ 07506	03/29/2021	03/29/2026
DOL	DOL		JOHN WASE		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		JORGE RAMOS		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	DOL		JOSEPH K. SALERNO		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL		JOSEPH K. SALERNO II		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		JRN CONSTRUCTION CO, LLC		1024 BROADWAY ALBANY NY 12204	11/07/2023	11/07/2028
DOL	DOL	*****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL	*****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL	*****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028

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DOL	DOL		JULIUS AND GITA BEHREND	5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002
DOL	DOL		KARIN MANGIN	796 PHELPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	DOL		KATE E. CONNOR	7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KEAN INDUSTRIES, LLC	2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	DOL	*****2959	KELC DEVELOPMENT, INC	7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KIMBERLY F. BAKER	7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL		KMA GROUP II, INC.	29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028
DOL	DOL	*****1833	KMA GROUP INC.	29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028
DOL	DOL		KMA INSULATION, INC.	29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028
DOL	DOL		KRIN HEINEMANN	2345 ROUTE 52, SUITE 2N HOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	NYC		KULWANT S. DEOL	9-11 40TH AVENUE LONG ISLAND CITY NY 11101	09/26/2023	09/26/2028
DOL	DA	*****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION	150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL		LEROY E. NELSON JR	531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		LEROY E. NELSON JR	531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		LEROY E. NELSON JR	531 THIRD ST ALBANY NY 12206	11/07/2023	11/07/2028
DOL	AG	*****3291	LINTECH ELECTRIC, INC.	3006 TILDEN AVE BROOKLYN NY 11226	02/16/2022	02/16/2027
DOL	DOL		LOUIS A. CALICCHIA	1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		LUBOMIR PETER SVOBODA	27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.	27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL	*****2196	MAINSTREAM SPECIALTIES, INC.	11 OLD TOWN RD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DA		MANUEL P TOBIO	150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	DA		MANUEL TOBIO	150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL		MAQSOOD AHMAD	618 OCEAN PKWY BROOKLYN NY 11230	09/17/2020	09/17/2025
DOL	NYC		MARIA NUBILE	84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	NYC	*****9926	MILLENNIUM FIRE PROTECTION, LLC	325 W. 38TH STREET SUITE 204NEW YORK NY 10018	11/14/2019	11/14/2024
DOL	NYC	*****0627	MILLENNIUM FIRE SERVICES, LLC	14 NEW DROP LNE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL	*****1320	MJC MASON CONTRACTING, INC.	42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL	*****1320	MJC MASON CONTRACTING, INC.	42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	NYC		MUHAMMED A. HASHEM	524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	NYC		NAMOW, INC.	84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DOL	*****7790	NATIONAL BUILDING & RESTORATION CORP	1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL	*****1797	NATIONAL CONSTRUCTION SERVICES, INC	1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	NYC		NAVIT SINGH	402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		NELCO CONTRACTING, LLC	1024 BROADWAY ALBANY NY 12204	11/07/2023	11/07/2028
DOL	DA		NICHOLAS T. ANALITIS	505 MANHATTAN AVE WEST BABYLON NY 11704	10/05/2023	10/05/2028

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DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	*****7429	NICOLAE I. BARBIR	BESTUCCO CONSTRUCTION, INC.	444 SCHANTZ ROAD ALLENTOWN PA 18104	09/17/2020	09/17/2025
DOL	NYC	*****5643	NYC LINE CONTRACTORS, INC.		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		PATRICK PENNACCHIO		2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	DOL		PATRICK PENNACCHIO		2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	DOL		PAULINE CHAHALES		935 S LAKE BLVD MAHOPAC NY 10541	03/02/2021	03/02/2026
DOL	DOL		PETER STEVENS		11 OLD TOWN ROAD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DOL		PETER STEVENS		8269 21ST ST BELLEROSE NY 11426	12/22/2022	12/22/2027
DOL	DOL	*****4168	PHANTOM CONSTRUCTION CORP.		95-27 116TH STREET QUEENS NY 11419	05/28/2024	05/28/2029
DOL	DOL	*****0466	PRECISION BUILT FENCES, INC.		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC		RASHEL CONSTRUCTION CORP		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****1068	RATH MECHANICAL CONTRACTORS, INC.		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL	*****2633	RAW POWER ELECTRIC CORP.		3 PARK CIRCLE MIDDLETOWN NY 10940	07/11/2022	07/11/2027
DOL	DA	*****7559	REGAL CONTRACTING INC.		24 WOODBINE AVE NORTHPORT NY 11768	10/01/2020	10/01/2025
DOL	DOL		RICHARD REGGIO		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	DOL		ROBBYE BISSEAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003
DOL	DOL		ROBERT A. VALERINO		3841 LANYARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	07/11/2022	07/11/2027
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	*****7172	RZ & AL INC.		198 RIDGE AVENUE VALLEY STREAM NY 11581	06/06/2022	06/06/2027
DOL	DOL		SAL FRESINA MASONRY CONTRACTORS, INC.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL		SAL MASONRY CONTRACTORS, INC.		(SEE COMMENTS) SYRACUSE NY 13202	07/16/2021	07/16/2026
DOL	DOL	*****9874	SALFREE ENTERPRISES INC		P.O BOX 14 2821 GARDNER RD POMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		SALVATORE A FRESINA A/K/A SAM FRESINA		107 FACTORY AVE P.O BOX 11070 SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	DOL		SAM FRESINA		107 FACTORY AVE P.O BOX 11070 SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	NYC	*****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	DA	*****0476	SAMCO ELECTRIC CORP.		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	NYC	*****1130	SCANA CONSTRUCTION CORP.		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL	*****2045	SCOTT DUFFIE	DUFFIE'S ELECTRIC, INC.	P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	DOL		SCOTT DUFFIE		P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	DA		SILVANO TRAVALJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028

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DOL	DOL	****0440	SOLAR GUYS INC.		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	NYC		SOMATIE RAMSUNAHAI		115-46 132ND ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL	****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC	****3661	SPANIER BUILDING MAINTENANCE CORP		200 OAK DRIVE SYOSSET NY 11791	03/14/2022	03/14/2027
DOL	DOL		STANADOS KALOGELAS		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL	****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL	****6844	STEAM PLANT AND CHX SYSTEMS INC.		14B COMMERCIAL AVENUE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	****9528	STEEL-IT, LLC.		17613 SANTE FE LINE ROAD WAYNESFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL	****3800	SUBURBAN RESTORATION CO. INC.		5-10 BANTA PLACE FAIR LAWN PLACE NJ 07410	03/29/2021	03/29/2026
DOL	DOL	****9150	SURGE INC.		8269 21ST STREET BELLEROSE NY 11426	12/22/2022	12/22/2027
DOL	DOL		SYED RAZA		198 RIDGE AVENUE NY 11581	06/06/2022	06/06/2027
DOL	DOL		TARLOK SINGH		95-27 116TH STREET QUEENS NY 11419	05/28/2024	05/28/2029
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL	****9733	TERSAL CONSTRUCTION SERVICES INC		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13208	07/16/2021	07/16/2026
DOL	DOL		TERSAL CONTRACTORS, INC.		221 GARDNER RD P.O BOX 14POMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		TERSAL DEVELOPMENT CORP.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL	****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		TIMOTHY PERCY		29807 ANDREWS ROAD BLACK RIVER NY 13612	10/17/2023	10/17/2028
DOL	DA	****1050	TRI STATE CONSTRUCTION OF NY CORP.		50-39 175TH PLACE FRESH MEADOWS NY 11365	03/28/2022	03/28/2027
DOL	DA	****4106	TRIPLE H CONCRETE CORP		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	****8210	UPSTATE CONCRETE & MASONRY CONTRACTING CO INC		449 WEST MOMBASHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL	****6418	VALHALLA CONSTRUCTION, LLC.		796 PHELPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	NYC	****2426	VICKRAM MANGRU	VICK CONSTRUCTI ON	21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	NYC		VICKRAM MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC	****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL	****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL	****8266	WILLIAM CHRIS MCCLENDON	MCCLENDON ASPHALT PAVING	1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM CHRIS MCCLENDON		1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM G. PROERFRIEDT		85 SPRUCEWOOD ROAD WEST BABYLON NY 11704	01/19/2021	01/19/2026
DOL	DOL	****5924	WILLIAM G. PROPHY, LLC	WGP CONTRACTIN G, INC.	54 PENTAQUIT AVE BAYSHORE NY 11706	01/19/2021	01/19/2026
DOL	DOL		XENOFON EFTHIMIADIS		29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028

Bid Form
GENERAL CONTRACTOR

Lockport, New York

To The Mayor and Common Council
City of Lockport, New York

I, _____

We, the undersigned, hereby propose to enter into a contract for the Lockport Raw Water Pump Station Improvements and to furnish all the materials, labor, and equipment, and to perform all the work necessary to fully complete said work in accordance with the Plans and Specifications, for the sum of

BASE BID (ITEMS G1, G2, G3)

_____ DOLLARS _____ CENTS

TOTAL \$ _____

ALTERNATE BID (ITEM G4)

_____ DOLLARS _____ CENTS

TOTAL \$ _____

NAME OF FIRM: _____

ADDRESS: _____

BY: _____ TITLE: _____

DATE: _____ TELEPHONE NO.: _____

Bidder acknowledges receipt of:

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

The Bidder further agrees to accept the following Unit Prices for additions or deductions in accordance with the terms of the contract, plans and specifications.

Bid Form
GENERAL CONTRACTOR

GENERAL BID - Bidder will complete the work in accordance with the Contract Documents for the following prices:

BASE BID

BID ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE (IN WORDS)	UNIT PRICE
G1	EXTERIOR CONCRETE CONSTRUCTION	LS		\$
G2	INTERIOR MODIFICAITON	LS		\$
G3	CONTINGENCY ALLOWANCE	LS	Two Thousand Dollars and Zero Cents	\$ 2,000.00
TOTAL	ITEMS G1 – G3			\$

ALTERNATE BID

BID ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE (IN WORDS)	UNIT PRICE
ALT G4	OVERHEAD DOOR	LS		\$
TOTAL	ITEM ALT G3			\$

All applicable Federal and State of New York taxes are excluded from the Lump Sum and Stipulated Prices.

Bid Form
GENERAL CONTRACTOR

- Note:
1. Amounts are to be shown in both words and figures. In the event of a discrepancy, the amount shown in words shall govern.
 2. Totals for each item are shown for convenience in comparing bids only. In the event of a discrepancy, the unit price(s) shown shall govern.
 3. BIDDERS MUST BID ON ALL ITEMS.
 4. The Owner reserves the right to reject any and all bids or reduce the scope of work according to the budgeted funds available at the time of the bid opening.
 5. The Owner reserves the right to compare bids on the basis of available funding.
 6. The Owner reserves the right to negotiate time schedules for construction based on the work qualifications of the successful bidder.
 7. The award of the Contract shall be made to the lowest Bidder who, in the opinion of the City, is qualified to perform the work required and is responsible and reliable. The lowest bid shall be determined by the City on the basis of the gross sum for which the entire work will be performed, arrived at by a correct computation of all the items specified in the bid, therefore, at the lump sum and/or unit price, if any, contained in the bid. When alternate bid items are required in the bid, the City reserves the right to select any alternate or combination of alternates and the contract will be awarded to that responsible Bidder whose bid for the alternate or combination of alternates, selected by the City is the lowest.

COMPANY

DATE

SIGNATURE

TITLE

Bid Form
HVAC CONTRACTOR

Lockport, New York

To The Mayor and Common Council
City of Lockport, New York

I, _____

We, the undersigned, hereby propose to enter into a contract for the Lockport Raw Water Pump Station Improvements and to furnish all the materials, labor, and equipment, and to perform all the work necessary to fully complete said work in accordance with the Plans and Specifications, for the sum of

BASE BID (ITEMS H1, H2, H3)

_____ DOLLARS _____ CENTS

TOTAL \$ _____

ALTERNATE BID (ITEM H4)

_____ DOLLARS _____ CENTS

TOTAL \$ _____

NAME OF FIRM: _____

ADDRESS: _____

BY: _____ TITLE: _____

DATE: _____ TELEPHONE NO.: _____

Bidder acknowledges receipt of:

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

The Bidder further agrees to accept the following Unit Prices for additions or deductions in accordance with the terms of the contract, plans and specifications.

Bid Form
HVAC CONTRACTOR

GENERAL BID - Bidder will complete the work in accordance with the Contract Documents for the following prices:

BASE BID

BID ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE (IN WORDS)	UNIT PRICE
H1	HVAC CONSTRUCTION	LS		\$
H2	DEMOLITION	LS		\$
H3	CONTINGENCY ALLOWANCE	LS	Two Thousand Dollars and Zero Cents	\$ 2,000.00
TOTAL	ITEMS H1 – H3			\$

ALTERNATE BID

BID ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE (IN WORDS)	UNIT PRICE
ALT H4	COMPRESSOR REPLACEMENT	LS		\$
TOTAL	ITEM ALT H4			\$

All applicable Federal and State of New York taxes are excluded from the Lump Sum and Stipulated Prices.

Bid Form
HVAC CONTRACTOR

- Note:
1. Amounts are to be shown in both words and figures. In the event of a discrepancy, the amount shown in words shall govern.
 2. Totals for each item are shown for convenience in comparing bids only. In the event of a discrepancy, the unit price(s) shown shall govern.
 3. BIDDERS MUST BID ON ALL ITEMS.
 4. The Owner reserves the right to reject any and all bids or reduce the scope of work according to the budgeted funds available at the time of the bid opening.
 5. The Owner reserves the right to compare bids on the basis of available funding.
 6. The Owner reserves the right to negotiate time schedules for construction based on the work qualifications of the successful bidder.
 7. The award of the Contract shall be made to the lowest Bidder who, in the opinion of the City, is qualified to perform the work required and is responsible and reliable. The lowest bid shall be determined by the City on the basis of the gross sum for which the entire work will be performed, arrived at by a correct computation of all the items specified in the bid, therefore, at the lump sum and/or unit price, if any, contained in the bid. When alternate bid items are required in the bid, the City reserves the right to select any alternate or combination of alternates and the contract will be awarded to that responsible Bidder whose bid for the alternate or combination of alternates, selected by the City is the lowest.

COMPANY

DATE

SIGNATURE

TITLE

Bid Form
ELECTRICAL CONTRACTOR

Lockport, New York

To The Mayor and Common Council
City of Lockport, New York

I, _____

We, the undersigned, hereby propose to enter into a contract for the Lockport Raw Water Pump Station Improvements and to furnish all the materials, labor, and equipment, and to perform all the work necessary to fully complete said work in accordance with the Plans and Specifications, for the sum of

BASE BID (ITEMS E1, E2, E3, E4, E5, E6, E7)

_____ DOLLARS _____ CENTS

TOTAL \$ _____

ALTERNATE BID (ITEM E8)

_____ DOLLARS _____ CENTS

TOTAL \$ _____

NAME OF FIRM: _____

ADDRESS: _____

BY: _____ TITLE: _____

DATE: _____ TELEPHONE NO.: _____

Bidder acknowledges receipt of:

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

The Bidder further agrees to accept the following Unit Prices for additions or deductions in accordance with the terms of the contract, plans and specifications.

Bid Form
ELECTRICAL CONTRACTOR

ELECTRICAL BID - Bidder will complete the work in accordance with the Contract Documents for the following prices:

BASE BID

BID ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE (IN WORDS)	UNIT PRICE
E1	SERVICE REPLACEMENT AND PREVENTATIVE MAINTENANCE	LS		\$
E2	GENERATOR, TRANSFER SWITCH, SWITCHGEAR AND VFD'S	LS		\$
E3	LIGHTING	LS		
E4	POWER	LS		
E5	SCADA	LS		
E6	DEMOLITION	LS		\$
E7	CONTINGENCY ALLOWANCE	LS	Ten Thousand Dollars and Zero Cents	\$ 10,000.00
TOTAL	ITEMS E1 – E7			\$

Bid Form
ELECTRICAL CONTRACTOR

ALTERNATE BID

BID ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE (IN WORDS)	UNIT PRICE
ALT E8	ELECTRICAL RELATED TO ALTERNATE COMPRESSOR	LS		\$
TOTAL	ITEM ALT E8			\$

All applicable Federal and State of New York taxes are excluded from the Lump Sum and Stipulated Prices.

Bid Form
ELECTRICAL CONTRACTOR

- Note:
1. Amounts are to be shown in both words and figures. In the event of a discrepancy, the amount shown in words shall govern.
 2. Totals for each item are shown for convenience in comparing bids only. In the event of a discrepancy, the unit price(s) shown shall govern.
 3. BIDDERS MUST BID ON ALL ITEMS.
 4. The Owner reserves the right to reject any and all bids or reduce the scope of work according to the budgeted funds available at the time of the bid opening.
 5. The Owner reserves the right to compare bids on the basis of available funding.
 6. The Owner reserves the right to negotiate time schedules for construction based on the work qualifications of the successful bidder.
 7. The award of the Contract shall be made to the lowest Bidder who, in the opinion of the City, is qualified to perform the work required and is responsible and reliable. The lowest bid shall be determined by the City on the basis of the gross sum for which the entire work will be performed, arrived at by a correct computation of all the items specified in the bid, therefore, at the lump sum and/or unit price, if any, contained in the bid. When alternate bid items are required in the bid, the City reserves the right to select any alternate or combination of alternates and the contract will be awarded to that responsible Bidder whose bid for the alternate or combination of alternates, selected by the City is the lowest.

COMPANY

DATE

SIGNATURE

TITLE

NON-COLLUSIVE BIDDING CERTIFICATION

By submission of this bid or proposal, the bidder certifies that: a) This bid or proposal has been independently arrived at without collusion with any other bidder or with any competitor or potential competitor; b) This bid or proposal has not been knowingly disclosed and will not be knowingly disclosed prior to the opening of bids or proposals for this project, to any other bidder, competitor, or potential competitor; c) No attempt has been or will be made to induce any other person, partnership, or corporation to submit or not to submit a bid or proposal; d) The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder as well as to the person signing in its behalf; e) That attached hereto (if corporate bidder) is a certified copy of resolution authorizing the execution of this certificate by the signature of this bid or proposal in behalf of the corporate bidder.

By:

Resolved that _____ be authorized to sign and submit the bid or proposal of this corporation for the following project: _____ and to include in such bid or proposal the certificate as to non-collusion required by Section one hundred three-D (103-D) of the general municipal law as the act and deed of such corporation, and for any inaccuracies or misstatements in such certificate this corporate bidder shall be liable under the penalties of perjury.

The foregoing is a true and correct copy of the resolution adopted by _____ corporation at a meeting of its Board of Directors held on the _____ day of _____.

Secretary

(SEAL)

End of Non-Collusive Bidding Certification

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CITY OF LOCKPORT CONTRACT

THIS AGREEMENT entered into this _____ day of _____, 2024 by and between the CITY OF LOCKPORT, a municipal corporation organized under the laws of the State of New York, with offices at one Locks Plaza, Lockport, New York 14094 and _____ with an office at _____, hereinafter referred to as the "Contractor."

WITNESSETH, that the CITY and the Contractor, for the consideration hereinafter named, agree as follows:

ARTICLE 1. WORK TO BE DONE AND CONSIDERATION THEREFOR:

The CITY shall pay the sum of \$_____ to Contractor upon the completion of services set forth in **Schedule "A"** annexed hereto.

ARTICLE 2. TIME OF COMPLETION:

The services to be rendered under this agreement shall be performed on dates set forth in **Schedule "A"**. Time of performance is of the essence of this agreement.

ARTICLE 3. ACCEPTANCE AND FINAL PAYMENT:

Upon receipt of written notice that the agreement has been fully performed, the Contractor shall file an itemized voucher with the Director of Finance for the CITY and the CITY will pay the Contractor, as per Article 1 above.

ARTICLE 4. CONTRACTORS' INSURANCE COVERAGE AND CERTIFICATES

The Contractor shall provide current Certificates of Insurance and accompanying documents as described herein for the OWNER'S approval prior to OWNER'S signing of contract(s).

- A. "Certificate Holder" shall be **City of Lockport** at the address of **One Locks Plaza, Lockport, New York 14094**.
- B. Coverage must comply with all specifications set forth herein.
- C. All insurance documents must be executed with *authorized* signatures.
- D. The Contractor's required liability policies must be endorsed to provide that any Notice of Cancellation or Notice of Non-Renewal given to the First Named Insured shall also be given to the Additional Insureds for this project. **A copy of such endorsement(s) must be furnished to the Certificate Holder.**

- E. Failure of the City to object to the Contractor's failure to furnish a Certificate or other evidence of the required insurance coverages, object to any defect in such Certificate or other evidence of coverage, or demand receipt of such Certificate or other evidence of coverage shall not be deemed a waiver of Contractor's obligation to furnish the required insurance coverages described herein. Nothing contained herein imposes on the City a duty or obligation to review any evidence of insurance coverages or issue any formal approval or acceptance of such evidence.
- F. The Contractor's liability and indemnification of the City shall not be relieved or diminished by the Contractor securing insurance coverage in accordance with the City's requirements. Any approval by the City of such insurance coverage shall not be construed as accepting in any way the deficiencies in the Contractor's insurance coverage.
- G. In addition to Certificates of Insurance and other documents, the Contractor shall provide to the Owner and other Certificate Holders, on a timely basis, copies of any subsequently issued endorsement(s) that amend coverages or limits.
- H. When any required insurance shall expire, due to the attainment of a normal expiration or renewal date, the Contractor shall supply, no later than ten (10) days prior to such expiration, the City with Certificates of Insurance and accompanying documents evidencing continuation of coverage in the same manner, limits of protection and scope as provided by the previous policy.
- I. The Contractor will assure that any and all subcontractors retained by the Contractor carry and maintain insurance with reasonably prudent limits and coverage satisfactory to the City in light of the work to be performed, written by companies meeting the same criteria as required in Section 2. LIABILITY INSURANCE, and that the City is named additional insured on the subcontractor's liability policies according to the same requirements as described in Section "Commercial General Liability" (B).
- J. The Contractor shall disclose to the City any deductible or self-insured retentions applicable to any of the coverages required herein of the Contractor.
- K. The Contractor's liability coverage must not contain any exclusions or restriction of coverage for claims involving New York Labor Law, Employer's Liability, third party over actions, or equivalent.

The CONTRACTOR agrees:

The Contractor agrees to secure and maintain, at the Contractor's own expense, all insurance coverage required herein from one or more insurance companies that are licensed to write such insurance in New York State or are eligible non-admitted insurers, per the current Excess Line Association of New York's (ELANY) official list. Insurers must carry an A.M. Best "Secure" rating of A- or better. The Contractor's insurance shall include the following, and shall be written with limits no less than hereinafter specified:

COMMERCIAL GENERAL LIABILITY

- A. Occurrence based **Commercial General Liability** coverage to include bodily injury, personal injury, and property damage applicable to ongoing operations, products & completed operations, and contractual liability, all with a per-project aggregate endorsement. There shall be no exclusions for NY State Labor Law. There shall be no exclusions for explosion, collapse, and underground operations (“XCU”). The coverage limits applicable shall be the greater of the amounts indicated below or the amounts carried by the Contractor:

General Aggregate	\$2,000,000
Products & Comp/Op. Aggregate	\$2,000,000
Personal & Advertising Injury	\$1,000,000
Each Occurrence	\$1,000,000
Fire Damage (any one fire)	\$ 50,000
Med. Expense (any one person)	\$ 5,000

- B. **Additional Insured:** Coverage in Commercial General Liability, Automobile Liability, and Excess Liability and/or Umbrella Liability policies or coverage sections shall be written or endorsed so as to apply to the following as **additional insured on a primary and non-contributory basis:**

"City of Lockport and its employees, authorized volunteers, committee members and board members"

This Additional Insured coverage must be at least as broad as ISO Form CG 20 10 11 85 or both CG 20 10, CG 20 26, CG 20 33, or CG 20 38; *and* CG 2037 forms together if later revisions are used, or the equivalent. In addition, the primacy of coverage must be at least as broad as ISO Form CG 20 01 04 13. The Certificate of Insurance must clearly state how Additional Insured coverage is achieved in the General Liability, Automobile Liability, and Umbrella/Excess Liability policies. Certificates of Insurance must show the form numbers that are used to achieve all of the Additional Insured coverage. A copy of the actual policy language that achieves this coverage in each policy must be provided to the Owner with the Certificate of Insurance.

- C. **Products & Completed Operations** coverages must be maintained in force for a **minimum of three (3) years** following Final Completion of the Project.
- D. **Waiver of Subrogation:** To the fullest extent permitted by applicable state law, a Waiver of Subrogation Clause shall be added to the General Liability, Automobile, Umbrella/Excess Liability, and Workers Compensation policies in favor of the City.
- E. **Pollution Liability:** *If* the Contractor’s work on this project involves handling or disturbance of **asbestos or other hazardous materials**, the Contractor shall provide bodily injury and property damage liability insurance applicable to this hazardous operation, covering both **ongoing operations and products & completed operations**, at limits not less than:

If covered by this Contractor’s umbrella/excess liability policy:

General Aggregate	\$1,000,000
Each Occurrence or Incident	\$1,000,000

If **NOT** covered by this Contractor’s umbrella/excess liability policy:

General Aggregate	\$11,000,000
Each Occurrence or Incident	\$11,000,000

F. **Unmanned Aircraft:** *If* the Contractor’s work on this project in any way involves the use of **unmanned aircraft (aka drones)**, the Contractor’s General Liability policy must include form CG 24 50 06 15 or equivalent providing coverage for this project. The coverage limit applicable shall be the greater of the amount indicated below or the amount carried by the Contractor:

Each Occurrence	\$1,000,000
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AUTOMOBILE LIABILITY INSURANCE

Bodily Injury and Property Damage, coverage for the Contractor as the owner or the lessee of automobiles, trucks, trailers, self-propelled Contractor’s equipment and all other owned, hired and non-owned vehicles registered for use on the public highway and/or used in operations relating to work under contract. If any such vehicles are to be used to transport hazardous materials, the Contractor shall also provide pollution liability broadened coverage evidenced by ISO Form CA 99 48. The coverage limit applicable shall be the greater of the amounts indicated below or the amount(s) carried by the Contractor:

Combined Single Limit	\$1,000,000
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Note: See Section “Commercial General Liability” (B) above for **additional insured** requirements applicable to Automobile Liability insurance.

EXCESS LIABILITY AND/OR UMBRELLA LIABILITY COVERAGE:

Applicable to Commercial General Liability and Automobile Liability policies. The Excess Liability and/or Umbrella Liability coverage limits applicable shall be the greater of the amounts indicated below or the amounts carried by the Contractor:

Each Occurrence	\$1,000,000
Aggregate	\$1,000,000

Note: See Section 2.1(b) above for **additional insured** requirements applicable to the Excess Liability and/or Umbrella Liability insurance.

WORKERS COMPENSATION AND EMPLOYER’S LIABILITY INSURANCE

Must include Waiver of Subrogation in favor of Owner.

Coverage required by the laws of New York State as further described below.

A. **Requirements.** To comply with coverage provisions of Section 57 of the Workers’ Compensation Law, businesses must **(1)** be legally exempt from obtaining workers’ compensation insurance coverage, **(2)** obtain such coverage from insurance carriers, or **(3)** be self-insured or participate in an authorized group self-insurance plan.

B. Coverage Evidence. The Contractor must provide one of the following forms to the Owner, or the current equivalent of any of them in the event of revisions or replacements:

- (a) Either: **CE-200**, Affidavit For New York Entities And Any Out Of State Entities With No Employees, That New York State Workers' Compensation And/Or Disability Benefits Insurance Coverage Is Not Required
- Or: **CE-200**, Affidavit That An OUT-OF-STATE OR FOREIGN EMPLOYER Working In New York State Does Not Require Specific New York State Workers' Compensation And/Or Disability Benefits Insurance Coverage
(Affidavits must be stamped as received by the N.Y.S. Workers' Compensation Board)

OR

- (b) Either: **C-105.2**, Certificate of Workers' Compensation
- Or: **U-26.3**, New York State Insurance Fund Certificate of Workers' Compensation Coverage

OR

- (c) Either: **SI-12** – Certificate of Workers' Compensation Self-Insurance,
- Or: **GSI-105.2** – Certificate of Participation in Workers' Compensation Group Self-Insurance

DISABILITY BENEFITS REQUIREMENTS UNDER WCL SECTION 220 SUBD. 8

A. Requirements. To comply with coverage provisions of the New York State Disability Benefits Law, businesses must (1) be legally exempt from obtaining disability benefits insurance coverage, (2) obtain such coverage from insurance carriers, or (3) be self-insured.

B. Coverage Evidence. The Contractor must provide one of the following forms to the Owner, or the current equivalent of any of them in the event of revisions or replacements:

- (a) Either: **CE-200**, Affidavit For New York Entities and Any Out of State Entities With No Employees, That New York State Workers' Compensation and/or Disability Benefits Insurance Coverage Is Not Required
- Or: **CE-200**, Affidavit That an OUT-OF-STATE OR FOREIGN EMPLOYER Working In New York State Does Not Require Specific New York State Workers' Compensation and/or Disability Benefits Insurance Coverage
(Affidavits must be stamped as received by the N.Y.S. Workers' Compensation Board)

OR

- (b) Either: **DB-120.1**, Certificate of Disability Benefits Insurance
- Or: **DB-820/829**, Certificate/Cancellation of Insurance

OR

- (c) **DB-155**, Certificate of Disability Benefits Self-Insurance

ARTICLE 5. REPRESENTATIONS OF CONTRACTOR:

The Contractor represents and warrants:

- (a) That it is financially solvent and that it is experienced in and competent to perform the type of work in accordance with **Schedule “A”**; and
- (b) That it is familiar with all federal, state, municipal and department laws, ordinances and regulations which may in any way affect the work or those employed therein.

ARTICLE 6. PERMITS AND REGULATIONS:

The Contractor shall procure and pay for all permits and licenses necessary for the services to be rendered hereunder.

ARTICLE 7. CITY’S RIGHT TO STOP WORK OR TERMINATE AGREEMENT:

The CITY shall have the right to stop work or terminate the agreement if:

- (a) The Contractor is adjudged bankrupt or makes an assignment for the benefit of creditors;
or
- (b) A receiver or liquidator is appointed for the Contractor or for any of its property and is not dismissed within 20 days after such appointment or the proceedings in connection therewith are not stayed on appeal within the said 20 days; or
- (c) The Contractor refuses or fails to prosecute the work or any part thereof with due diligence; or
- (d) The Contractor fails to make prompt payment to persons supplying labor for the work; or
- (e) The Contractor fails or refuses to comply with all applicable laws or ordinances; or
- (f) The Contractor is guilty of a substantial violation of any provision of this Contract;
- (g) In any event, the CITY, without prejudice to any other rights or remedy it may have, may by seven (7) days’ notice to the Contractor, terminate the employment of the Contractor and its right to proceed as to the work. In such case, the Contractor shall not be entitled to receive any further payment until the work is complete. If the unpaid balance of the compensation to be paid to the Contractor hereunder exceeds the expense of completing the work, such excess shall be paid to the Contractor. If such expense exceeds such unpaid balance, the Contractor shall be liable to the CITY for such excess.

ARTICLE 8. DAMAGES:

It is hereby mutually covenanted and agreed that the relation of the Contractor to the work to be performed by it under this Contract shall be that of an independent contractor. As an independent contractor, it will be responsible for all damage, loss or injury to persons or property that may arise in or be incurred during the conduct and progress of said work, as a result of the neglect or omission of

Contractor, its agents, or employees have been negligent. The Contractor shall hold and keep the CITY free and discharged of and from any and all responsibility and liability of any sort or kind. To the extent of its liability the Contractor shall assume all responsibility for risks or casualties of every description, for loss or injury to persons or property arising out of the nature of the work, from the action of the elements, or from any unforeseen or unusual difficulty. The Contractor shall make good any damages that may occur in consequence of the work or any part of it. The Contractor shall assume all blame, loss and responsibility of any nature by reason of neglect or violation of any federal, state, county or local laws, regulations or ordinances by it or its agents or employees.

ARTICLE 9. INDEMNITY AND SAVE HARMLESS AGREEMENT:

The Work performed by the Contractor shall be at the risk of the Contractor exclusively. To the fullest extent permitted by law, Contractor shall indemnify, defend (at Contractor's sole expense) and hold harmless CITY, its representatives, members, designees, officers, directors, employees, agents, successors, and assigns ("Indemnified Parties"), from and against any and all claims for bodily injury, death or damage to property, demands, damages, actions, causes of action, suits, losses, judgments, obligations and any liabilities, costs and expenses (including but not limited to investigative and repair costs, attorney's fees and costs, and consultants' fees and costs) ("Claims") which arise or are in any way connected with the Work performed, Materials furnished, or Services provided under this Agreement by Contractor or its agents. These indemnity and defense obligations shall apply to any acts or omissions, negligent or willful misconduct of Contractor, its employees or agents, whether active or passive. Said indemnity and defense obligations shall further apply, whether or not said claims arise out of the concurrent act, omission, or negligence of the Indemnified Parties, whether active or passive. Contractor shall not be obligated to indemnify and defend the CITY for claims found to be due to the sole negligence or willful misconduct of Indemnified Parties.

Contractor's indemnification and defense obligations hereunder shall extend to Claims occurring after this Agreement is terminated as well as while it is in force, and shall continue until it is finally adjudicated that any and all actions against the Indemnified Parties for such matters which are indemnified hereunder are fully and finally barred by applicable Laws.

ARTICLE 10. NO ASSIGNMENT:

The Contractor is hereby prohibited from assigning, transferring, conveying, subletting or otherwise disposing of this agreement, or of its right, title or interest in this agreement, or its power to execute this agreement, to any other person or corporation without the previous consent in writing of the CITY.

ARTICLE 11. REQUIRED PROVISIONS OF LAW:

Each and every provision of law and clause required by law to be inserted in this agreement shall be deemed to have been inserted herein. If any such provision is not inserted through mistake or otherwise, then upon the application of either party, this Contract shall be physically amended forthwith to make such insertion. In particular, the Contractor shall, among other things, fully comply with:

- (a) Labor Law Section 220-e and Executive Law Sections 291-299 and the Civil Rights Law relating to prohibition against discrimination and equal opportunity.

- (b) Affirmative action as required by the Labor Law.
- (c) Prevention of dust hazard required by Labor Law Section 222-a.
- (d) Preference in employment of persons required by Labor Law Section 222.
- (e) Eight hour day as required by Labor Law Section 220(2).

ARTICLE 12. PREVAILING WAGE RATES REQUIRED BY LAW:

(a) The parties hereto, in accordance with the provisions of Section 220(3) of the Labor Law, hereby agree that there shall be paid each employee engaged in work under this Contract not less than the wage rate and supplements set opposite the trade or occupation in which he is engaged, as listed on **Schedule B** attached hereto and made a part of this agreement, which are the wage rates and supplements established as the prevailing rate of wages for the work covered by this Contract.

(b) Labor classifications not appearing on the schedule of wages can be used only with the consent of the CITY and then the rate to be paid will be given by the CITY after being advised by the Department of Labor.

(c) The Contractor shall post in a prominent and accessible place on the site of the work a legible statement of all wage rates and supplements as specified in the Contract, for the various classes of mechanics, workmen, or laborers employed on the work.

ARTICLE 13. AUTHORITY FOR EXECUTION ON BEHALF OF THE CITY:

The Mayor has executed this agreement pursuant to a Resolution adopted by the Common Council at a meeting thereof held on [date approved by resolution]. Mayor John Lombardi, III, whose signature appears hereafter, is duly authorized and empowered to execute this instrument and enter into such an agreement on behalf of the CITY. This instrument shall be executed in duplicate. At least one copy shall be permanently filed, after execution thereof, in the office of the CITY.

ARTICLE 14. NOTICES:

Any and all notices and payments required hereunder shall be addressed as follows, or to such other address as may hereafter be designated in writing by either party hereto:

To CITY

City of Lockport
 Municipal Building
 1 Locks Plaza
 Lockport, NY 14094

To Contractor

ARTICLE 15. WAIVER:

No waiver of any breach of any condition of the Agreement shall be binding unless in writing and signed by the party waiving said breach. No such waiver shall in any way affect any other term or condition of this Agreement or constitute a cause or excuse for a repetition of such or any other breach unless the waiver shall include the same.

ARTICLE 16. MODIFICATION:

This Agreement constitutes the complete understanding of the parties. No modification of any provisions thereof shall be valid unless in writing and signed by both parties.

ARTICLE 17. APPLICABLE LAW:

This Agreement is governed by the laws of the State of New York.

IN WITNESS WHEREOF, the City of Lockport has caused its corporate seal to be affixed hereto and these presents to be signed by Mayor John Lombardi, III, duly authorized to do so, and to be attested to by Sarah K. Lanzo, City Clerk, and the Contractor has caused its corporate seal to be affixed hereto and these presents to be signed by its President, the day and year first above written.

(affix seal)

City of Lockport

Authorized by Resolution No. _____

By: _____
Mayor

Director of Finance approval

ABC Company

By: _____

Corporation Counsel approval

City Clerk approval

Schedule A

To be completed upon contract execution.

Schedule B

Contractor is responsible for obtaining an updated Prevailing Wage Schedule from the New York State Department of Labor. For more information about how to obtain an original Prevailing Wage Schedule please refer to:

<http://www.labor.state.ny.us/workerprotection/publicwork/PWReqforOWS.shtm>

Construction Performance Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name & Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location): Lockport RWPS Improvements

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond Form:

CONTRACTOR AS PRINCIPAL

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

CONTRACTOR AS PRINCIPAL

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

End of Construction Performance Bond

Construction Payment Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name & Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location): Lockport RWPS Improvements

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond Form:

CONTRACTOR AS PRINCIPAL

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

CONTRACTOR AS PRINCIPAL

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: _____ (Corp. Seal)

Signature: _____

Name and Title:

EJCDC No. 1910-28B (1984 Edition)

Prepared through the joint efforts of the Surety Association of America, Engineers' Joint Contract Documents Committee, the Associated General Contractors of America, American Institute of Architects, American Subcontractors Association, and the Associated Specialty Contractors.

End of Construction Payment Bond

GENERAL REQUIREMENTS

1. SCOPE OF WORK - The work to be done under this Contract, as outlined under the heading of "Notice to Contractors", includes the furnishing of all labor, materials, tools, power and construction equipment necessary for the completion of the work, including all miscellaneous items as hereinafter specified and shown on plans.
2. CONTRACT DRAWINGS AND SPECIFICATIONS - The work to be done is shown on the accompanying drawing prepared by the City of Lockport Engineering Department. This original drawing may be supplemented by other drawings furnished by the Contractor and approved by the Engineer. Additional drawings may be prepared by the Engineer and supplied to the Contractor during the progress of the work as he may deem to be necessary or expedient. These original and supplementary drawings constitute the drawings according to which the work is to be done.

Drawings and specifications are deemed essential parts of this contract, and shall be construed as cooperative. Any work called for on the drawings and not specifically mentioned in the specifications or described in the specifications and not particularly shown on the drawings, is to be regarded as included under this contract the same as if fully set forth in the specifications and exhibited on the drawings. Where figures or definite dimensions are given on the drawings or in the specifications, these shall have precedence over dimensions taken by scaling.

In case any inconsistency, omission, or conflict shall be discovered in either specifications or drawings, or if in any place the meaning of either or both shall be obscure, or uncertain, or in dispute, the Engineer shall decide as to the true intent and his decision shall be final and binding.

3. MEASUREMENT - Measurements of the work will be taken by the Engineer to determine the amount of work done, to which the unit or Lump Sum prices of the contract will be applied to determine the cost. Measurements for sewer and water lines will exclude intervening valves, fittings and inside dimensions of manholes, which will be paid for under those specific items. All measurements made by the Engineer shall be final and conclusive evidence of the amount of work performed under this Contract.

For computation of the quantities of earthwork to be paid for under various items of the contract, it is agreed that the planimeter shall be considered an instrument of precision, and quantities computed from areas obtained by its use shall be accepted by all parties hereto as accurate. Arithmetical computations, utilizing any type of computing device or machines including electronic computers, shall not be precluded by reference to the planimeter.

For the purpose of calculating stone and asphalt quantities the following yields shall be used:

Base Material - 105 pounds per Sq. Yd. per 1" depth

Binder - 110 pounds per Sq. Yd. per 1" depth

Top - 120 pounds per Sq. Yd. per 1" depth

Compacted run of crusher stone 2.0 tons per Cu.Yd.

4. POWER, LIGHT OR TELEPHONE POLES - All power, light, telephone and other service poles and all appurtenant structures that are located within the limits of any necessary excavation made for this project or its appurtenant structures, will be moved and relocated at no expense to the Contractor. Any pole located outside of the above limits which the Contractor wishes to have moved, to facilitate the use of his equipment or progress of the work, the Contractor shall make the necessary arrangements with the owner of the pole to have it moved, and the Contractor shall pay any and all costs involved thereby. In the event that there is any question as to whether or not pole is located within the limits of the excavation as defined heretofore, the Engineer shall decide, and his decision shall be binding upon the City and upon the Contractor and Utility Company.
5. INTERFERENCE WITH OTHER UNDERGROUND UTILITIES - Any gas or water main, power, light, telephone conduit or service connection thereto or any other subsurface structure that crosses or passes through the space occupied by any of the completed structures that are a part of this Contract, shall be moved, relocated and reconnected by the owner of such service connection or structure. Any of the above enumerated underground utilities or other structures that are located outside of the space occupied by the completed structures of this Contract, and which the Contractor wishes to have moved to facilitate the use of his equipment or progress of the work, the Contractor shall make the necessary arrangements with the owner of such structure to have it moved, and the Contractor shall pay any and all cost involved thereby. In the event that there is any question as to whether any of the above enumerated underground utilities or other structures cross or pass through the space occupied by the completed structures of this Contract, the Engineer shall decide and his decision shall be binding upon the City and upon the Contractor.
6. PIPES CROSSING TRENCH - All existing gas pipes, water pipes, service pipes, steam pipes, electric conduits, sewers, drains and hydrants, railway tracks and other structures which do not in the opinion of the Engineer require to be changed in location, shall be carefully supported and protected from damage by the Contractor, and in case of damage by the Contractor they shall be restored by him without additional compensation to as good condition as that in which they were found. Where pipes, conduits or sewers are removed from the trench, leaving dead-ends in the ground, such ends shall be carefully plugged or bulkheaded with brick and mortar or metal fittings as required by the Contractor without additional compensation.

7. SUBCONTRACTS - The Contractor agrees to be fully responsible to the Owner for the acts or omissions of his subcontractors and for anyone employed directly or indirectly by him or them and this contract obligation shall be in addition to the liability imposed by law upon the Contractor.

Nothing contained in the contract documents shall create any contractual relationship between any subcontractor and the Owner. The Contractor agrees to bind every subcontractor and every subcontractor agrees to be bound by the terms of this agreement, plans and specifications, as far as applicable to his work, unless otherwise specifically approved in writing as adequate by the Owner.

8. RELATION TO OTHER CONTRACTORS - The Contractor shall so conduct his operations as not to interfere with or damage the work of other Contractors or workmen employed on adjoining or related work, and he shall promptly make good any injury or damage which may be done to such work by him or his employees or agents. Should a contract for adjoining work be awarded to another Contractor, and should the work on one of these contracts interfere with that of the other, the Engineer shall decide which contract shall cease work for the time being and which shall continue, or whether work on both contracts shall continue at the same time and in what locations.

9. CONTRACTOR'S ORGANIZATION - The Contractor shall establish and maintain an office on the site of the work, or at some convenient point adjacent thereto, during the continuance of this contract, and shall have at all times during working hours, a representative authorized to receive and execute any and all orders, when given by the Engineer; and such order, when given to and received by said representative, shall be deemed to have been given to the received by the Contractor. Copies of the shop drawings shall at all times be kept on file by the Contractor at readily accessible points near the work.

10. CODES, ORDINANCES, LAWS AND REGULATIONS - The Contractor and Subcontractors shall observe and comply with all Federal, State and Local codes, ordinances, laws and regulations in force at the construction site, and shall protect and indemnify the Owner and the Owner's officers and agents against any claim or liability including reasonable attorney's fees and legal expenses incurred by owner, its officers and agents, arising from or based on any violation of the same.

The Contractor shall pay for and obtain all permits for work, pay all charges for inspection and tests, file plans and specifications to the inspection department having jurisdiction, and secure and pay all costs or licenses.

11. UTILITIES - Unless otherwise provided in these specifications, the Contractor shall make his own arrangements for electricity, gas, water and sewer services for use during the construction of the work and shall pay for all connections, extensions and services.

12. GAS - If gas is present in existing sewers where the Contractor must work, the sewer shall be cleared of gas before entering. If the gas cannot be removed by natural ventilation, by the removal of manhole covers, the Contractor shall maintain forced draft to render the sewers safe as determined by gas detection equipment.
13. CONTROL OF NOISE - The Contractor shall eliminate noise to as great an extent as possible at all times. Air compressors shall be equipped with silencers and the exhaust of all gasoline motors and other power equipment shall be provided with mufflers. In the vicinity of hospitals, libraries and schools, special precautions shall be taken to avoid noise and other nuisances; and the Contractor shall require strict observances of all pertinent ordinances and regulations. Any blasting permitted in such locations shall be done with reduced charges.
14. SMOKE PREVENTION - Strict compliance with all ordinances regulating the production and emission of smoke will be required and the Contractor shall accept full responsibility for all damage that may occur to property as a result of negligence in providing required control.
15. DUST CONTROL - The Contractor shall apply water or dust palliative or both, for the alleviation or prevention of dust nuisance caused by his operations. Dust control operations shall be performed by the Contractor at the time ordered by the Engineer, but failure of the Engineer to issue such order will not relieve the Contractor of this responsibility. No direct payment will be made for any such work performed or material used to control dust under this Contract.
16. RIGHT-OF-WAY - The necessary right-of-ways for the construction of drains, sewers, main and appurtenant structures, across or under private property, will have been or will be obtained by the Owner. In carrying out the work on private right-of-ways, the Contractor shall take due and proper precautions against any injury to adjacent structures, and shall hold himself strictly within the rights secured by the Owner.

In the event that the Owner is unable to obtain right-of-ways before construction begins, the Contractor shall not be entitled to make or assert a claim for damage for said delay; but time for completion of the work will be extended to such time as the Owner determines will compensate for the time lost by such delay.

17. FENCES - No fences shall be removed or destroyed by the Contractor without the written permission of the Engineer. The Contractor shall be held fully responsible for any damages caused by his work to adjoining fences. Fences that have to be removed shall be preserved and replaced in a manner acceptable to the Engineer. Damaged material shall be replaced with new material.
18. MONUMENTS - During the progress of the work, the Contractor may encounter street intersection, section line, and fractional section line monuments. Insofar as known, such monuments have been indicated on the drawings. The Contractor shall not remove any such monument until the Engineer shall have set four (4) iron pipe stakes, each two (2) feet

long, as reference points for the resetting of such monuments. Reference stakes shall be located in such positions that they will not be disturbed by any construction operations. The Contractor shall furnish the necessary iron pipe stakes, necessary labor and other assistance required by the Engineer for his work in setting the reference stakes. After this referencing has been done and suitable permanent sketches prepared, the Engineer will give permission to the Contractor for the removal of the monument. The Owner will reset monuments after all backfilling has fully settled.

19. SAFETY - A. The Contractor and Subcontractors shall comply with Federal, State and local laws and regulations governing the furnishing and use of safeguards, safety devices and protective equipment, and take any other needed actions on his own responsibility, as reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property during the construction of the project.

B. If the City finds the Contractor to be in non-compliance of any requirement under this section, it shall:

1. Warn the Contractor, either verbally or in writing to comply with such requirement within a period of two hours from the time the verbal or written warning is given to the Contractor.
2. In the event of non-compliance with a verbal or written warning under Section 19(A), caused the job to be shut down until compliance is obtained in accordance with such written or oral warning.
3. In the event a Contractor fails to comply with such requirement within three (3) days of the job discontinuance under Section 19(B), this contract shall be terminated upon written notice by the City to the Contractor and Section 30 of the General Conditions, relating to termination, shall govern the rights and responsibilities of the parties.

20. WORKMANSHIP - It is mutually understood that the workmanship furnished under this Contract shall all be first class, to the end that a good and substantial and workmanlike job may be produced. The Contractor shall furnish suitable tools and building appliances and employ competent labor to perform the work to be done; and any labor, tools or appliances that shall not, in the judgment of the Engineer, be suitable or competent to produce this result, may be ordered from the work by him, and such labor or tools or appliances shall be substituted therefore by the Contractor, as will meet with the approval of the Engineer.

Unless otherwise stipulated in the specifications, all materials and articles incorporated in the work covered by this contract are to be new and of the best grade of their respective kinds for the purpose. The Contractor shall, if required, furnish such evidences to kinds and quality of materials as the Engineer may require.

21. TIME AND SEQUENCE OF WORK -In general, it is the intention and understanding that the Contractor shall have control over the sequence or order or execution of the several parts of the work to be done under the contract, and over the method of accomplishing the

required results, except as some particular sequence of method may be distinctly demanded by the drawings and specifications or by the expressed provisions of the Contract. The Engineer may, however, make such reasonable requirements as may, in his judgment be necessary for the proper and effective protection of work, partially or wholly completed and to these requirements the Contractor shall conform.

22. TESTING - Where tests are required, they shall be made at the expense of the Contractor, except as otherwise called for in the specifications. For materials covered by ASTM, AWWA, or Federal Specifications, unless otherwise stipulated, the required tests are to be made by the manufacturer and his certificate therefore submitted to the Engineer.

For materials covered by New York State Department of Public Works, materials shall be secured from stockpiles approved by them, or where tests are required, they will be made at the expense of the Contractor.

Compaction tests will be made by a representative of the Owner and paid for by the Contractor. The Engineer shall schedule and select the locations of the tests.

23. MOVING EQUIPMENT - All heavy equipment moved over improved streets shall be transported on equipment trailers or moved over planking placed on the paving and as directed by the Engineer.
24. DISORDERLY EMPLOYEES - Disorderly, intemperate, or incompetent persons must not be employed, retained or allowed upon the work. Any foreman or workmen who refuses to or neglects to comply with the directions of the Engineer in the matter of personal conduct, shall at the request of the Engineer, be promptly discharged and shall not thereafter be re-employed without the consent of the Engineer.
25. PRELIMINARY CLEAN-UP - The Contractor shall at all times, keep the clean up work closely allied with the actual installation of the various portions of the work. The following items shall be attended to within twenty-four (24) hours after the actual installation at any given point:
- (a) Replacement of road signs, mail boxes, paper boxes.
 - (b) Driveways shall be slightly rounded (3 inches +), and shall have an application of stone, if required, to control dust and/or mud.
 - (c) Road pavements shall be cleared of all dirt, stone, and so forth.
 - (d) Open cuts in highway pavements shall have temporary bituminous tops and shall be maintained full.

Within a week of the actual installation at any given point, the following items shall be accomplished.

- (a) Lawns shall be cleaned up, the area adjacent to the trench raked, the trench to be slightly rounded (6 inches maximum).
- (b) Sidewalks and projections shall be leveled out, the walks cleaned, and temporary stone walkways provided.
- (c) All debris, consisting of branches, trees, lumber, stones, and so forth, shall be removed.
- (d) Driveway culverts shall be cleaned out and/or replaced as required.
- (e) Cross culverts, drain inlets, drain tiles, ditches, and so forth shall be cleaned out and/or replaced.
- (f) Road ditches paralleling the road shall be rough graded.
- (g) Surplus material shall be removed.
- (h) Top soil added and area fine graded to one (1) inch above finish grade.

Complaints of a specific nature shall be attended to within twenty-four (24) hours of notice to the Contractor.

The above conditions are considered as being preliminary clean up only.

- 26. REPLACING EXISTING CONDITIONS - The Contractor shall in all cases be responsible for maintaining or replacing all lawns, shrubs, plants, hedges and trees damaged by him.
- 27. HAZARDS CREATED OVER WEEK-ENDS, HOLIDAYS OR ANY TIME AFTER THE CONTRACTOR HAS LEFT THE SITE OF WORK - The Contractor, after verbal or written notification by the Engineer or his representative, will correct in reasonable length of time, any hazardous condition that has been created on the job.

The Engineer will determine what constitutes a reasonable length of time.

Hazards include, but are not limited to: failure of temporary pavement, trench settlement, obstructions to sidewalks, driveways, plant entrances, alleyways, improperly stored equipment or materials, improperly constructed, inadequate or damaged barricades, lack of sufficient number of warning lights, flares or signs, water conditions caused by lack of drainage.

Emergency Contact Person - The Contractor shall designate someone to be available to respond to emergency calls. The name of the person and the telephone number at which he/she can be reached at any time shall be given to the Engineer, and all police agencies in the area. Such person shall have full authority and capability to mobilize forces promptly as required to respond to an emergency and protect the public.

If in the opinion of the Engineer, the Contractor does not eliminate the hazard in question,

the City will correct the condition and charge the cost of all labor, material and equipment to the Contractor.

28. FINAL CLEANUP AND GRADING - Upon completion of construction and before final payment is made, the Contractor shall restore his working area to as clean a condition as existed before his operations were started. He shall go over the entire line and refill any place that may have settled. He shall then regrade and put in shape all backfilled trenches, all fills he may have made from excess excavated materials, and all other areas that may have been disturbed through his operations.

Surplus materials, tools and all dirt, rubbish and excess earth from excavation shall be hauled to a dump provided by the Contractor.

If, during the progress of the work, it should become necessary, because of the lateness of the season, strikes, lack of materials, etc., to stop the work, then the Contractor shall open proper drainage ditches, erect temporary structures where necessary, prepare the project so that there will be a minimum interference with traffic, set up and maintain a competent organization, as directed by the Engineer, to keep the contract in first class condition for traffic, and take every precaution to prevent any damage or unreasonable deterioration of the work during the time it is closed.

End of General Requirements

SUPPLEMENTAL REQUIREMENTS

- 1) Contractor shall submit a work schedule and list of subcontractors to the Engineer for approval prior to construction.
- 2) Contractor to remove all debris generated from his work each day and leave the work area in a clean condition.
- 3) All excavated material, to be hauled from site. Contractor is responsible for suitable dumpsite, which meets local codes, and DEC regulations.
- 4) All Contractors and Sub-Contractors while working in the City of Lockport shall possess a City of Lockport Contractor's license. This license is obtainable from the City's Building Inspection Department. Their phone number is 716-439-6754.
- 5) Contractor shall designate one full time employee as Project Superintendent and ensure that they are on site at all times during the work. Contractor to provide the City of Lockport Engineering Department with emergency phone numbers to reach Project Superintendent at any hour of the day.
- 6) Contractor shall maintain access to driveways, parking lots and traffic at all times.
- 7) Contractor is responsible to notify underground utilities to mark utilities prior to construction.
- 8) Contractor shall not leave any tools or equipment unattended at any time.
- 9) Contractor shall coordinate all work each day for the following day's work shift with plant operator.

End of Supplemental Requirements

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Contract description.
 - 2. Work by Owner or other Work at the Site.
 - 3. Owner-furnished products.
 - 4. Contractor's use of Site and premises.
 - 5. Future work.
 - 6. Work sequence.
 - 7. Owner occupancy.
 - 8. Permits.
 - 9. Specification conventions.

1.2 GENERAL CONTRACT DESCRIPTION

- A. Contractor shall ensure that all work depicted on the contract drawings and described within specifications for the awarded items is completed and included in submitted bid prices.
- B. Work of the Project to be completed by the General Contractor shall include providing and installing all improvements to the existing Raw Water Pump Station as shown on all Sheets identified with the numbers G-XXX and S-XXX, and generally described as follows:
 - 1. General Site Construction
 - a. Site work including excavation, subbase, concrete slabs, restoration, and disposal of waste materials.
 - b. Proposed new interior CMU wall and man door includes existing housekeeping pad removal,
 - c. Proposed infilling of existing louver openings to install new louvers.
 - d. Restoration of any disturbed areas from construction activity or equipment to Owner's satisfaction on the project site.
 - e. Site restoration.
 - 2. Alternate - General Site Construction
 - a. Proposed new rolling overhead door includes removal of existing double man door, block wall demolition, proposed lintel, wall repair and painting, installation of roll door and removal and disposal of all demolished materials.
 - 3. Coordinate with HVAC and Electrical Contracts.

1.3 HVAC CONTRACT DESCRIPTION

- A. Contractor shall ensure that all work depicted on the contract drawings and described within specifications for the awarded items is completed and included in submitted bid prices.

SECTION 011000 - SUMMARY

- B. Work of the Project to be completed by the HVAC Contractor shall include providing and installing all improvements to the existing Raw Water Pump Station as shown on all Sheets identified with the numbers M-XXX and MD-XXX and generally described as follows:
 - 1. HVAC Construction
 - a. Removal of an exhaust fan, fan damper, and thermostat.
 - b. Removal of several motorized dampers and birdscreen in their entirety.
 - c. Proposed new ductless split HVAC system with the condenser mounted to an exterior wall and wall mounted indoor unit. System to include wall mount thermostat.
 - d. Proposed new ventilation system for the motor/pump area. System to include a new combination air intake louver/damper and two exhaust fans with motorized dampers, weatherhoods, and thermostats.
 - 2. Alternate – HVAC Construction
 - a. Proposed removal and replacement of existing compressor. Reconnection to existing building pneumatic system.
 - 3. Coordinate with General and Electrical Contracts.

1.4 ELECTRICAL CONTRACT DESCRIPTION

- A. Contractor shall ensure that all work depicted on the contract drawings and described within specifications for the awarded items is completed and included in submitted bid prices.
- B. Work of the Project to be completed by the Electrical Contractor shall include providing and installing all improvements to the existing Raw Water Pump Station as shown on all Sheets identified with the numbers E-XXX, EDXXX and ESXXX and generally described as follows:
 - 1. Electrical Construction
 - a. Proposed temporary generator disconnect switch.
 - b. Provide temporary generator for service feeder replacement and preventative maintenance to outdoor switchgear and transformer including replacement of batteries and battery charger.
 - c. Proposed removal and replacement of service feeders work including new pole riser, new feeders, coordination with National Grid (NGRID), all NGRID fees, and removal of old feeders.
 - d. Proposed testing and preventative maintenance to outdoor switchgear and oil filled transformer.
 - e. Installation of diesel generator provided by the City, including all associated conduits and wiring and assistance during start-up.
 - f. Proposed staged removal of the distribution switchgear and VFD sections.
 - g. Installation of proposed distribution switchgear, Automatic Transfer Switch (provided by the City) distribution panel HVP-1, VFD's sections, pull sections and active filter panel, including all associated conduits and wiring and assistance during start-up.
 - h. Connection of portable generator disconnect switch, including wiring and conduit installation to HVP-1.
 - i. Proposed new interior lighting fixtures including all conduit, wiring, and controls, including removal of existing fixtures, removal of exposed

SECTION 011000 - SUMMARY

- abandoned conduits, removal of existing wiring, installation of proposed lighting fixtures.
- j. Proposed removal and replacement of 208/120V electrical panel LVP-1 and 45KVA transformer. Disconnect all wiring and reconnect all circuits on new panel.
 - k. Existing crane disconnect relocation and rewiring to HVP-1.
 - l. Installation of chlorine gas detection system, turbidity meter, water chlorine monitoring system, including all associated conduits and wiring and assistance during start-up.
 - m. Provide conduit and wiring to all HVAC equipment being installed, coordinate with the HVAC for all wiring, including disconnecting and removal of all associated abandoned conduit and wiring associated with existing HVAC equipment being removed.
 - n. Proposed removal of existing SCADA system and installation of proposed SCADA system including disconnect/reconnect of existing signals and installation of proposed conduits and wiring for proposed devices. Modify the SCADA system at the Water Filtration plant to communicate all information to/from the Raw Water Pump Station
 - o. Demolition of existing switchgear, VFD's, abandoned control cabinet, and exposed conduit and wiring for demolished equipment.
 - p. Start-up and commissioning of all equipment provided.
 - q. Operation & Maintenance Manuals for all equipment provided.
- 2. Alternate – Electrical Construction
 - a. Disconnection of power to existing non-functional compressor and reconnection of power following installation of replacement compressor.
 - 3. Coordination with General and HVAC Contracts.

1.5 WORK BY OWNER OR OTHERS

- A. Contractors shall coordinate with Owners operations.

1.6 OWNER-FURNISHED PRODUCTS

- A. The owner is providing a pre-purchased generator and automatic transfer switch. Refer to Appendix A for generator and transfer switch shop drawings.

1.7 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Time Restrictions for Performing Interior & Exterior Work: Monday through Friday, 7:00 am – 5:00 pm unless prior authorization received from Owner for different days and times.
- B. Utility Outages and Shutdown:
 - 1. Coordinate and schedule utility outages with Owner.
 - 2. Outages: Allowed only at previously agreed upon times
 - 3. At least one week before scheduled outage, submit Outage Request Plan to Engineer itemizing the dates, times, and duration of each requested outage.
- C. Sound Level Restrictions: Sound pressure level measured at boundary of Site shall not exceed 40 dBA. Contractor is to be aware that residents live nearby to project site and care shall be taken to limit noises to reasonable times.

SECTION 011000 - SUMMARY

- D. Construction Plan: Before start of construction post electronic file to Project website of construction plan regarding access to Work, use of Site, and utility outages for acceptance by Owner. After acceptance of plan, construction operations shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.8 OWNER OCCUPANCY

- A. Owner will occupy facility during entire period of construction. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- B. Schedule the Work to accommodate Owner occupancy and continued operation of the Raw Water Pumping Station.

1.9 PERMITS

- A. Furnish all necessary permits for construction of Work including the following:
 - 1. Building permit from The City of North Tonawanda.
 - 2. Demolition permit from The City of North Tonawanda.
- B. All permit costs shall be included in Bid.

1.10 SPECIFICATION CONVENTIONS

- A. These Specifications are written in imperative mood and streamlined form. This imperative language is directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 012700 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description
- B. Engineer's Estimate of Quantities
- C. Adjustment of Unit Prices for Increase or Decrease of Estimated Quantities
- D. Related Provisions
- E. Bid Items – General Contract
- F. Bid Items – HVAC Contract
- G. Bid Items – Electrical Contract

1.2 DESCRIPTION

- A. The items listed below beginning with Articles 1.6, 1.7 and 1.8, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, Engineer's and/or Contractor's field offices, layout surveys, job signs, sanitary requirements, permits, testing, safety devices, approval and record drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, bonds, insurance, test pits and all other requirements of the General Conditions, Supplementary Conditions, and the General Requirements. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and work unit price pay items listed herein.
- B. The lump sum and unit bid prices will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- C. The Contractor shall furnish all labor, materials, tools, equipment, services, and all appurtenances necessary to perform all work required, at the unit or lump sum prices for the items listed in the Bidder's Proposal. Each bid item shall include all costs to perform all work to complete each item. Work shall include, but is not necessarily limited to earth excavation, disposal of excess excavated material, handling of all water, dewatering, earth backfill, select backfill, concrete, demolition and disposal; installation of overhead roll door, wall infill, installation of HVAC equipment, installation of electrical equipment, conduits, cables, terminations, splices, pull boxes, fittings, hangers, wall penetrations, junction boxes, instrumentation and control, grounding, all final restoration, and testing.
- D. Where fixed minimum unit prices are called for under an item heading, the bidder shall include a price not less than the stated minimum. Bidders' Proposals received which include a unit price less than the stated minimum shall be adjusted to meet the minimum unit price.

SECTION 012700 - MEASUREMENT AND PAYMENT

1.3 ENGINEER'S ESTIMATE OF QUANTITIES

- A. Engineer's estimated quantities for unit price pay items, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. Owner does not expressly or by implication agree that the nature of the materials encountered or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as Owner may deem necessary. Except as provided in Article 1.03, Contractor or Owner will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions caused by changes or alterations in the Work ordered by Owner.

1.4 CONTINGENCY ALLOWANCE

- A. Contingency allowances are stipulated amounts available as reserved for sole use by Owner to cover unanticipated costs.
- B. When authorization of Work under contingency allowance is contemplated by Owner for a defined scope, submit Change Order proposal to Engineer. Prepare Change Order proposal in accordance with the General Conditions as may be modified by the Supplementary Conditions, except that payments within limit of contingency allowance shall exclude cost of bond and insurance premiums.

1.5 ADJUSTMENT OF UNIT PRICES FOR INCREASE OR DECREASE OF ESTIMATED QUANTITIES

- A. For bid items paid for on a unit price basis, increases or decreases in the quantity of an item of Work will be determined by comparing the total payable quantity of Work with Engineer's estimated quantity as shown in the Bid Form. Increase or decreases will only be considered if the Schedule of Values as required in Section 012900 has been prepared, submitted, and approved.
- B. If the total payable quantity of any unit price item of Work, which has an as-bid computed total value of five percent or more of the sum of the as-bid computed total values of all items bid, varies from Engineer's estimate of quantity therefore by more than 50 percent, the unit price of that item will be a subject of review by Engineer. If warranted, an equitable adjustment will be made by means of a Change Order to credit Owner with any reduction in cost or to compensate Contractor for any increase in cost resulting from the change in quantity. This review of the adjustment will be made at a time Engineer deems reasonable and proper.
- C. Payment for any unit price item of Work which has an as-bid computed total value of less than five percent of the sum of the as-bid computed total values of all items bid, will be made at the unit price bid regardless of an increase or decrease in quantity.

1.6 RELATED PROVISIONS

- A. Payments to Contractor: Refer to General Conditions and Agreement.
- B. Changes in Contract Price: General Conditions.

SECTION 012700 - MEASUREMENT AND PAYMENT

- C. Summary: Section 011000
- D. Schedule of Values: Section 012900.

1.7 BID ITEMS – GENERAL CONTRACT

A. ITEM G1 – FOR EXTERIOR CONCRETE CONSTRUCTION

- 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Exterior Concrete Construction, the work shall include, all work as described in Section 011000 1.2 B 1 a, e, and f.
- 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

B. ITEM G2 – INTERIOR MODIFICATIONS

- 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Interior CMU wall and Door, the work shall include, all work as described in Section 011000 1.2 B 1 c.
 - c. Infilling of louvers, the work shall include, all work as described in Section 011000 1.2 B 1 d.
- 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

C. ITEM G3 – CONTINGENCY ALLOWANCE FOR MISCELLANEOUS WORK

- 1. Measurement: Allowance includes a stipulated amount available as reserve for sole use by Owner to cover unanticipated costs.
- 2. Include an allowance of \$2,000 for Bid Item G3 for Miscellaneous Work.
- 3. Payment for Work authorized under Item G3 will be full compensation for providing all Work authorized under the contingency allowance, complete as specified or directed by Engineer. Work authorized under contingency allowance may be included in subsequent Application(s) for Payment, as

SECTION 012700 - MEASUREMENT AND PAYMENT

applicable, following authorization and performance of contingency allowance Work.

- D. ITEM ALT G4 – OVERHEAD DOOR (ALTERNATE)
1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Overhead door, the work shall include, all work as described in Section 011000 1.2 B 1 b.
 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

1.8 BID ITEMS – HVAC CONTRACT

- A. ITEM H1 – HVAC CONTRACT
1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Interior CMU wall and Door, the work shall include, all work as described in Section 011000 1.3 B 1 c and d.
 - c. Turbidity and Chlorine Monitor piping, the work shall include, all work as described in Section 011000 1.3 B 1 e.
 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.
- B. ITEM H2 – DEMOLITION
1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Demolition, the work shall include, all work as described in Section 011000 1.3 B 1 a and b.

SECTION 012700 - MEASUREMENT AND PAYMENT

2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

C. ITEM H3 – CONTINGENCY ALLOWANCE FOR MISCELLANEOUS WORK

1. Measurement: Allowance includes a stipulated amount available as reserve for sole use by Owner to cover unanticipated costs.
2. Include an allowance of \$2,000 for Bid Item H3 for Miscellaneous Work.
3. Payment for Work authorized under Item H3 will be full compensation for providing all Work authorized under the contingency allowance, complete as specified or directed by Engineer. Work authorized under contingency allowance may be included in subsequent Application(s) for Payment, as applicable, following authorization and performance of contingency allowance Work.

D. ITEM ALT H4 – COMPRESSOR REPLACEMENT (ALTERNATE)

1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Compressor replacement, the work shall include, all work as described in Section 011000 1.3 B 2 a.
2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

1.9 BID ITEMS – ELECTRICAL CONTRACT

A. ITEM E1 – SERVICE REPLACEMENT AND PREVENTATIVE MAINTANENCE.

1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Service replacement and preventative maintenance, the work shall include, all work as described in Section 011000 1.4 B 1 a, b, c, and d.
2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.

SECTION 012700 - MEASUREMENT AND PAYMENT

- b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.
- B. ITEM E2 – GENERATOR, SWITCHGEAR, TRANSFER SWITCH, AND VFD’S.
- 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Installation of generator, staged switchgear, automatic transfer switch, and VFD’s, the work shall include, all work as described in Section 011000 1.4 B 1 e, f, g, and h.
 - 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.
- C. ITEM E3 – LIGHTING.
- 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Interior lighting removal and replacement, the work shall include, all work as described in Section 011000 1.4 B 1 i.
 - 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.
- D. ITEM E4 – POWER.
- 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Panel LVP-1 and transformer replacement and crane connection, the work shall include, all work as described in Section 011000 1.4 B 1 j and k.

SECTION 012700 - MEASUREMENT AND PAYMENT

- c. Chlorine gas detection system and water quality monitoring systems x the work shall include, all work as described in Section 011000 1.4 B 1 l
 - d. HVAC demolition and proposed connections, the work shall include, all work as described in Section 011000 1.4 B 1 m.
 - 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.
- E. ITEM E5 – SCADA REPLACEMENT.
 - 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. SCADA removal and replacement, the work shall include, all work as described in Section 011000 1.4 B 1 n.
 - 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.
- F. ITEM E6 – DEMOLITION.
 - 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 - b. Demolition, the work shall include, all work as described in Section 011000 1.4 B 1 o.
 - 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

SECTION 012700 - MEASUREMENT AND PAYMENT

- G. ITEM E7 – CONTINGENCY ALLOWANCE FOR MISCELLANEOUS WORK
1. Measurement: Allowance includes a stipulated amount available as reserve for sole use by Owner to cover unanticipated costs.
 2. Include an allowance of \$10,0000 for Bid Item E7 for Miscellaneous Work.
 3. Payment for Work authorized under Item E7 will be full compensation for providing all Work authorized under the contingency allowance, complete as specified or directed by Engineer. Work authorized under contingency allowance may be included in subsequent Application(s) for Payment, as applicable, following authorization and performance of contingency allowance Work.
- H. ITEM ALT E8 – ELECTRICAL FOR ALTERNATE COMPRESSOR
1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements, as shown, specified, and directed.
 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION

SECTION 012900 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description
- B. Preparation
- C. Submittal

1.2 DESCRIPTION

- A. The Schedule of Values is an itemized list that establishes the value or cost of each part of the Work. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional work or credits which may arise during the construction. Quantities and unit prices may be included in the schedule when approved by or required by the Engineer.

1.3 PREPARATION

- A. Schedule shall show breakdown of labor, materials equipment and other costs used in preparation of the Bid.
- B. Costs shall be in sufficient detail to indicate separate amounts for each Section of the Specification and each site.
- C. Contractor may include an item for bond, insurance, temporary facilities and job mobilization. This item will be included for payment at a rate of 25 percent per month for the first four months.
- D. Schedule of Values shall be prepared on 8½-inch by 11-inch white paper.
- E. Use Table of Contents of the Specifications as basis for Schedule format and identify each item with number and title in the Table of Contents. List sub-items of major products or systems as appropriate or when requested by Engineer.
- F. When requested by Engineer, support values with data that will substantiate their correctness.
- G. The sum of the individual values shown on the Schedule of Values must equal the total Contract Price.
- H. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
- I. Schedule shall show the purchase and delivery costs for materials and equipment that the Contractor anticipates he shall request payment for prior to their installation.
- J. Included in the detailed breakdown shall be a line item for "record documents". This amount is for preparing and supplying required information and documentation.

SECTION 012900 - SCHEDULE OF VALUES

1.4 SUBMITTAL

- A. Submit two copies of Schedule to Engineer for approval at least 20 days prior to submitting first application for a progress payment but no later than 10 days after date of execution of agreement. After review by Engineer, revise and resubmit Schedule as required until it is approved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Coordination and Project conditions.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Closeout meeting.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.
- C. Each Contractor shall furnish to the Engineer an emergency phone number list for 24 hour contact during the construction period. Include numbers for office phones, pagers, and cellular phones, as applicable. The list should include, but not be limited to:
 - Contractor's office representative,
 - Contractor's field superintendent,
 - Contractor's foreman,
 - Owner's main office,
 - Owner's 24 hour emergency number,
 - Project Engineer
 - Project Inspector,
 - Utility companies such as gas, water, soil oil, telephone, cable, TV, etc.
 - Other involved agencies.
 1. Contractor shall add names and numbers given to him by Engineer and resubmit to Engineer as requested.
 2. Emergency phone list must be submitted and considered acceptable to Engineer prior to the start of construction.
 3. Phone list must be neatly typed and work processed and submitted on 8 ½ x 11 inch paper.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practical; place runs parallel with lines of building. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

function as intended. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are important.

- E. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy and for portions of Work designated for Owner's occupancy.
- H. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

1.3 PRECONSTRUCTION MEETING

- A. Engineer will schedule and preside over meeting after Notice of Award.
- B. Attendance Required: Engineer, Owner, Resident Project Representative, appropriate governmental agency representatives, Construction Manager, major Subcontractors, Contractor and Contractor's on-site supervisor.
- C. Minimum Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Review of Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule.
 - 5. Designation of personnel representing parties in Contract, and Engineer.
 - 6. Communication procedures.
 - 7. Procedures and processing of requests for interpretations, field decisions, and field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Critical Work sequencing.
 - 10. Scheduling activities of Geotechnical Engineer.
 - 11. Scheduling activities of testing agency.
- D. Site Mobilization Issues:
 - 1. Use of premises by Owner and Contractor.
 - 2. Owner's requirements.
 - 3. Construction facilities and controls provided by Owner.
 - 4. Security and housekeeping procedures.
 - 5. Schedules.
 - 6. Procedures for testing.
 - 7. Procedures for maintaining record documents.
 - 8. Requirements for startup of equipment.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

9. Inspection and acceptance of equipment put into service during construction period.
- E. Contractor Construction Manager: Record minutes and distribute copies to participants within three business days after meeting, with one copy each to Engineer, Owner, and those in attendance.

1.4 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum bi-weekly intervals.
- B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.
- C. Attendance Required: Engineer, Owner, Contractor's job superintendent, major Subcontractors and suppliers, and others, as appropriate to agenda topics for each meeting.
- D. Minimum Agenda:
 1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems impeding planned progress.
 5. Review of submittal schedule and status of submittals.
 6. Review of off-Site fabrication and delivery schedules.
 7. Maintenance of Progress Schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on Progress Schedule and coordination.
 13. Other business relating to Work.
- E. Contractor: Record minutes and distribute copies to participants within three business days after meeting, with one copy each to Engineer, Owner, and those affected by decisions made.

1.5 CLOSEOUT MEETING

- A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.
- B. Attendance Required: Contractor Construction Manager, Engineer, Owner, and others appropriate to agenda.
- C. Notify Engineer four days in advance of meeting date.
- D. Minimum Agenda:
 1. Start-up of facilities and systems.
 2. Operations and maintenance manuals.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

3. Testing, adjusting, and balancing.
 4. System demonstration and observation.
 5. Operation and maintenance instructions for Owner's personnel.
 6. Contractor's inspection of Work.
 7. Preparation of an initial "punch list."
 8. Procedure to request Engineer inspection to determine date of Substantial Completion.
 9. Completion time for correcting deficiencies.
 10. Inspections by authorities having jurisdiction.
 11. Partial release of retainage.
 12. Final cleaning.
 13. Preparation for final inspection.
 14. Closeout Submittals:
 - a. Project record documents.
 - b. Operating and maintenance documents.
 - c. Operating and maintenance materials.
 - d. Affidavits.
 15. Final Application for Payment.
 16. Contractor's demobilization of Site.
 17. Maintenance.
- E. Record minutes and distribute to participants within three days after meeting, with one copy each to Engineer, Owner, and those affected by decisions made.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 ALTERATION PROCEDURES

- A. Entire facility will be occupied for normal operations during progress of construction. Cooperate with Owner in scheduling operations to minimize conflict and to permit continuous usage.
1. Perform Work not to interfere with operations of occupied areas.
 2. Keep utility and service outages to a minimum and perform only after written approval of Owner.
 3. Clean Owner-occupied areas daily. Clean spillage, overspray, and heavy collection of dust in Owner-occupied areas immediately.
- B. Materials: As specified in product Sections; match existing products with new and salvaged products for patching and extending Work.
- C. Employ skilled and experienced installer to perform alteration and renovation Work.
- D. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion. Comply with Section 017000 - Execution and Closeout Requirements
- E. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

- F. Remove debris and abandoned items from area and from concealed spaces.
- G. Prepare surface and remove surface finishes to permit installation of new Work and finishes.
- H. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.
- I. Remove, cut, and patch Work to minimize damage and to permit restoring products and finishes to original or specified condition.
- J. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified or renewed condition for each material, with neat transition to adjacent finishes.
- K. Where new Work abuts or aligns with existing Work, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- L. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect/Engineer for review.
- M. Where change of plane of 1/4 inch or more occurs, request instructions from Engineer.
- N. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.
- O. Finish surfaces as specified in individual product Sections.

END OF SECTION

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description
- B. Submittals
- C. Use of Owner's Facilities
- D. Shutdowns, Tie-ins and Coordination with Owner's Operations

1.2 DESCRIPTION

- A. CONTRACTOR shall carry out all operations to avoid interference with the operations of the existing facilities.
- B. CONTRACTOR shall cooperate fully with the OWNER when the CONTRACTOR's operations or unforeseen conditions beyond the OWNER's control negatively effect the operation of the wastewater treatment plant. The CONTRACTOR shall cooperate fully with the OWNER including the stopping of work to avoid loss of pumping and/or detrimental water quality issues, at no additional cost to the OWNER.
- C. The OWNER may restrict the CONTRACTOR's operations with respect to shutdowns, tie-ins, and starting and placing equipment in operation as specified during the period from May 15th to September 15th of any calendar year.

1.3 SUBMITTALS

- A. For work which may affect the OWNER's operations and for proposed connections including shutdowns of General / Mechanical or Electrical Systems, and tie-ins to Mechanical or Electrical Systems, submit to the ENGINEER for approval the following:
 - 1. Detailed schedules and descriptions of construction procedures.
 - 2. Inventory of labor, materials, equipment and supplies needed to perform the work.
 - 3. Detailed description of all preparatory work.
 - 4. Submittals required for equipment and material described under other Sections.
 - 5. The plan shall clearly demonstrate the CONTRACTOR's ability to meet the time limitations specified.
- B. All information submitted shall be in conformance with Submittal Procedures.
- C. All information shall be submitted not less than 21 days prior to commencing the work. CONTRACTOR shall provide OWNER written notice at least 2 weeks before shutdowns or tie-ins are required.
- D. No work which may affect the OWNER's operations will be permitted until the required submittals are approved by the ENGINEER.

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

1.4 USE OF OWNER'S FACILITIES

- A. CONTRACTOR may use existing facilities or equipment in the new Work for construction purposes only if the OWNER'S written permission is obtained.
- B. Restore existing facilities and equipment used for temporary purposes to original condition in a manner satisfactory to OWNER.
- C. CONTRACTOR shall assume full responsibility for any damage that may result to existing or new facilities or equipment used for construction purposes and shall repair or replace any damaged facilities or equipment at CONTRACTOR'S cost.
- D. The CONTRACTOR will be allowed to use the equipment as noted on the Drawings.

1.5 SHUTDOWNS, TIE-INS AND COORDINATION WITH OWNER'S OPERATIONS

- A. All operation of existing valves and gates required for shutdowns and bypasses shall be done by the OWNER. All operation of existing electrical equipment required for shutdowns shall be done by the OWNER, unless otherwise directed by the OWNER or ENGINEER.
- B. Insofar as possible, all equipment and material shall be tested and in operating condition and all preparatory work shall be completed to the greatest extent possible before shutdowns or tie-ins are commenced.
- C. Work that requires shutdowns and tie-ins to the existing Electrical facilities shall be coordinated with the OWNER and ENGINEER. The CONTRACTOR may be limited to a specific period of time for the shutdown, and/or non-standard working hours for shutdowns of the Electrical system, so as not to interfere with the treatment process. Shutdowns shall be limited to a maximum of eight (8) hours.
Where work cannot be accomplished within eight (8) hours, the Contractor shall be responsible for all costs, fees, labor, etc. to provide the OWNER with temporary utility services, equipment, etc. to maintain normal operation at the facility. This may include but not be limited to temporary power via portable generators.
- D. All work shall be scheduled at the convenience of the OWNER and under no circumstances shall it adversely affect the quality of the plant effluent. Work shall not interfere with the OWNER in meeting permitted effluent levels as are imposed upon the existing system.
- E. CONTRACTOR shall coordinate the shutdowns, tie-ins and connection work with the OWNER, ENGINEER, and other Work specified under this Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. Bar chart schedules.
- D. Review and evaluation.
- E. Updating schedules.
- F. Distribution.

1.2 SUBMITTALS

- A. Schedule Updates:
 - 1. Overall percent complete, projected and actual.
 - 2. Completion progress by listed activity and subactivity, to within five working days prior to submittal.
 - 3. Changes in Work scope and activities modified since submittal.
 - 4. Delays in submittals or resubmittals, deliveries, or Work.
 - 5. Adjusted or modified sequences of Work.
 - 6. Other identifiable changes.
 - 7. Revised projections of progress and completion.
- B. Narrative Progress Report:
 - 1. Submit with each bi-weekly submission of Progress Schedule.
 - 2. Summary of Work completed during the past period between reports.
 - 3. Work planned during the next period.
 - 4. Explanation of differences between summary of Work completed and Work planned in previously submitted report.
 - 5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
 - 6. Corrective action taken or proposed.

1.3 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request, and having use of computer facilities capable of delivering detailed graphic printout within 4 hours of request.

1.4 BAR CHART SCHEDULES

- A. Format: Bar chart Schedule, to include at least:
 - 1. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:
 - a. Subcontract Work.

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

- b. Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
 - c. Move-in and other preliminary activities.
 - d. Equipment and equipment system test and startup activities.
 - e. Project closeout and cleanup.
 - f. Work sequences, constraints, and milestones.
2. Listings identified by Specification Section number.
 3. Identification of the following:
 - a. Horizontal time frame by year, month, and week.
 - b. Duration, early start, and completion for each activity and subactivity.
 - c. Critical activities and Project float.
 - d. Subschedules to further define critical portions of Work.

1.5 REVIEW AND EVALUATION

- A. Participate in joint review and evaluation of schedules with Engineer at each submittal.
- B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
- C. After review, revise schedules incorporating results of review, and resubmit within 3 days.

1.6 UPDATING SCHEDULES

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update schedules to depict current status of Work.
- C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Upon approval of a Change Order, include the change in the next schedule submittal.
- E. Indicate changes required to maintain Date of Substantial and Total Completion.
- F. Submit sorts as required to support recommended changes.
- G. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect.

1.7 DISTRIBUTION

- A. Following joint review, distribute copies of updated schedules to Contractor's Project site file, to Subcontractors, suppliers, Engineer, and Owner.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Submittal procedures.
- C. Construction progress schedules.
- D. Proposed product list.
- E. Product data.
- F. Use of electronic CAD files of Project Drawings.
- G. Shop Drawings.
- H. Samples.
- I. Other submittals.
- J. Design data.
- K. Test reports.
- L. Certificates.
- M. Manufacturer's instructions.
- N. Manufacturer's field reports.
- O. Erection Drawings.
- P. Construction photographs.
- Q. Contractor review.
- R. Architect/Engineer review.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical Samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

SECTION 013300 - SUBMITTAL PROCEDURES

1.3 SUBMITTAL PROCEDURES

- A. Submittals are to be electronically submitted to the Engineer.
- B. Transmit each submittal with AIA G810 - Transmittal Letter CSI Form 12.1A - Submittal Engineer-accepted form.
- C. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- D. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- E. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.
- F. Schedule submittals to expedite Project, submit electronic submittals via e-mail as PDF electronic files to Engineer. Coordinate submission of related items.
- G. For each submittal for review, allow 10 business days excluding delivery time to and from Contractor.
- H. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- I. Allow space on submittals for Contractor and Engineer review stamps.
- J. When revised for resubmission, identify changes made since previous submission.
- K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- L. Submittals not requested will not be recognized nor processed.
- M. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of /Engineer.

1.4 PROPOSED PRODUCT LIST

- A. Within 10 business days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

SECTION 013300 - SUBMITTAL PROCEDURES

1.5 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic submittals via email as PDF electronic files.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.6 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
 - 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 - 4. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
 - 5. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
 - 6. Receiver shall not hold Engineer responsible for such viruses or their consequences, and shall hold Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.
 - 7. Contractor will sign waiver for use of electronic CAD files as included.

SECTION 013300 - SUBMITTAL PROCEDURES

1.7 SHOP DRAWINGS

- A. Shop Drawings: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
 - 1. Include signed and sealed calculations to support design.
 - 2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 - 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit electronic submittals via email as PDF electronic files.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.8 SAMPLES

- A. Samples: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
 - 1. Submit to /Engineer for aesthetic, color, and finish selection.
 - 2. Submit Samples of finishes, textures, and patterns for Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Specification Sections; Engineer will retain two Samples.
- F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

SECTION 013300 - SUBMITTAL PROCEDURES

1.9 OTHER SUBMITTALS

- A. Closeout Submittals: Comply with Section 017000 - Execution and Closeout Requirements.
- B. Informational Submittal: Submit data for Architect/Engineer's knowledge as Contract administrator or for Owner.
- C. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.
- D. Include certification showing compliance with American Iron and Steel requirements per Appendix C.

1.10 TEST REPORTS

- A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Engineer.

1.12 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.13 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit report in duplicate within 3 days of observation to Engineer for information.

SECTION 013300 - SUBMITTAL PROCEDURES

- C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.14 ERECTION DRAWINGS

- A. Informational Submittal: Submit Drawings for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

1.15 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of Site and construction throughout progress of Work produced by photographer acceptable to Engineer.
- B. At bi-weekly progress meetings submit photographs.
- C. Photographs: digital copy with accompanying description.
- D. Take sufficient number of site photographs from different directions both interior and exterior (minimum of 5 per bi-weekly meeting) photographs of site indicating relative progress of the Work, two days maximum before submitting.
- E. Take photographs as evidence of existing Project conditions:
- F. Identify each print on front. Identify name of Project, Contract number phase orientation of view, date and time of view, name and address of photographer, and photographer's numbered identification of exposure.
- G. Digital Images: Deliver complete set of digital image electronic files on CD-ROM to Owner with Project record documents. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as sensor, uncropped.
 - 1. Digital Images: Uncompressed TIFF format, produced by digital camera with minimum sensor size of 4.0 megapixels, and image resolution of not less than 1024 by 768 pixels.
 - 2. Date and Time: Include date and time in filename for each image.

1.16 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to Engineer.
- B. Contractor: Responsible for:
 - 1. Determination and verification of materials including manufacturer's catalog numbers.
 - 2. Determination and verification of field measurements and field construction criteria.

SECTION 013300 - SUBMITTAL PROCEDURES

3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 4. Determination of accuracy and completeness of dimensions and quantities.
 5. Confirmation and coordination of dimensions and field conditions at Site.
 6. Construction means, techniques, sequences, and procedures.
 7. Safety precautions.
 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Engineer.

1.17 ARCHITECT/ENGINEER REVIEW

- A. Do not make "mass submittals" to Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 20 or more submittals or items in one week. If "mass submittals" are received, Engineer's review time stated above will be extended as necessary to perform proper review. Engineer will review "mass submittals" based on priority determined by Engineer after consultation with Owner and Contractor.
- B. Informational submittals and other similar data are for Engineer's information, do not require Engineer's responsive action, and will not be reviewed or returned with comment.
- C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.
- D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Engineer's Supplemental Instruction Field Order, or Construction Work Change Directive.
- E. Owner may withhold monies due to Contractor to cover additional costs beyond the second submittal review.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 013310 - SUBSTITUTIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description
- B. Contractor's Options
- C. Substitutions

1.2 DESCRIPTION

- A. Requests for review of a substitution shall conform to the requirements of the General Conditions and shall contain complete data substantiating compliance of proposed substitution with Contract Documents.

1.3 CONTRACTOR'S OPTIONS

- A. For materials or equipment (hereinafter products) specified only by reference standard, select product meeting that standard, by any manufacturer, fabricator, supplier or distributor (hereinafter manufacturer). To the maximum extent possible, provide products of the same generic kind from a single source.
- B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with Specifications.
- C. For products specified by naming one or more products or manufacturers and stating "or equal", submit a request for a substitution for any product or manufacturer which is not specifically named.
- D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is permitted, there is no option and no substitution will be allowed.
- E. Where more than one choice is available as a Contractor's option, select product which is compatible with other products already selected or specified.

1.4 SUBSTITUTIONS

- A. During a period of 30 days after date of commencement of Contract Time, Engineer will consider written requests from Contractor for substitution of products or manufacturers, and construction methods (if specified).
 - 1. After end of specified period, requests will be considered only in case of unavailability of product or other conditions beyond control of Contractor.
- B. Owner will withhold monies due to Contractor to cover additional Engineer's costs associated with requests for substitution.
- C. Submit 5 copies of request for substitution. Submit separate request for each substitution. In addition to requirements set forth in Article 7.05 of General Conditions, include in request the following:

SECTION 013310 - SUBSTITUTIONS

1. For products or manufacturers:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature with product description, performance and test data, and reference standards.
 - c. Samples, if appropriate.
 - d. Name and address of similar projects on which product was used, and date of installation.
 2. For construction methods (if specified):
 - a. Detailed description of proposed method.
 - b. Drawings illustrating method.
 3. Such other data as the Engineer may require to establish that the proposed substitution is equal to the product, manufacturer or method specified.
- D. In making request for substitution, Contractor represents that:
1. Contractor has investigated proposed substitution, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified.
 2. Contractor will provide the same or better guarantees or warranties for proposed substitution as for product, manufacturer or method specified.
 3. Contractor waives all claims for additional costs or extension of time related to proposed substitution that subsequently may become apparent.
- E. A proposed substitution will not be accepted if:
1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.
 2. It will delay completion of the Work, or the work of other contractors.
 3. It is indicated or implied on a Shop Drawing and is not accompanied by a formal request for substitution from Contractor.
- F. If the Engineer determines that a proposed substitute is not equal to that specified, Contractor shall furnish the product, manufacturer or method specified at no additional cost to Owner.
- G. Approval of a substitution will not relieve Contractor from the requirement for submittals as set forth in the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality control.
- B. Tolerances.
- C. References.
- D. Labeling.
- E. Mockup requirements.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Products, materials, and equipment may be subject to inspection by Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

SECTION 014000 - QUALITY REQUIREMENTS

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current as of date for receiving Bids except where specific date is established by code.
- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

- A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.
- B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mockups shall be comparison standard for remaining Work.
- D. Where mockup has been accepted by Engineer and is specified in product Specification Sections to be removed, remove mockup and clear area when directed to do so by Engineer.

1.7 TESTING AND INSPECTION SERVICES

- A. Contractor will employ and pay for specified services of an independent firm to perform testing and inspection.

SECTION 014000 - QUALITY REQUIREMENTS

- B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Engineer.
 - 1. Laboratory: Authorized to operate at Project location in State of New York.
 - 2. Laboratory Staff: Maintain full-time Professional Engineer or specialist on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Engineer or Owner.
- D. Reports shall be submitted by independent firm to Engineer, Contractor, and authorities having jurisdiction, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as noncompliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Engineer and independent firm 48 hours before expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.
- F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.
- G. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- H. Agency Responsibilities:
 - 1. Test Samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at Site. Cooperate with Engineer and Contractor in performance of services.
 - 3. Perform indicated sampling and testing of products according to specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of Work or products.
 - 6. Perform additional tests required by Engineer.
 - 7. Attend preconstruction meetings and progress meetings.
- I. Agency Reports: After each test, promptly submit one copy of report to Engineer, Contractor, and authorities having jurisdiction. When requested by Engineer, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.

SECTION 014000 - QUALITY REQUIREMENTS

3. Name of inspector.
 4. Date and time of sampling or inspection.
 5. Identification of product and Specification Section.
 6. Location in Project.
 7. Type of inspection or test.
 8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- J. Limits on Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

1.8 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment and commissioning as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer is subject to approval of Engineer.
- C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Refer to Section 013300 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary facilities under Construction Management Agreement. (NOT USED)
- B. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Temporary sanitary facilities.
- C. Construction Facilities:
 - 1. Progress cleaning and waste removal.
 - 2. Fire-prevention facilities.
- D. Temporary Controls:
 - 1. Enclosures and fencing.
 - 2. Security.
 - 3. Water control.
 - 4. Dust control.
 - 5. Erosion and sediment control.
 - 6. Noise control.
- E. Removal of utilities, facilities, and controls.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 TEMPORARY FACILITIES UNDER CONSTRUCTION MANAGEMENT AGREEMENT (NOT USED)

1.4 TEMPORARY GENERAL CONSTRUCTION ELECTRICITY

- A. Use Owner's existing power service, unless otherwise noted.
- B. Provide temporary electric service as needed for electrical service replacement. Refer to drawings for additional electrical details.
- C. Complement existing power service capacity and characteristics as required for construction operations.
- D. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

- E. Permanent convenience receptacles may be used during construction.
- F. Provide distribution equipment, wiring, and outlets for single-phase branch circuits for power and lighting.
 - 1. Provide 20-ampere duplex outlets, single-phase circuits for power tools as needed in active work area.
 - 2. Provide 20-ampere, single-phase branch circuits for lighting.

1.5 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain building lighting for construction operations to achieve minimum lighting level of 2 watts/sq ft.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, lamps, and the like, for specified lighting levels.
- C. Maintain lighting and provide routine repairs.
- D. Permanent building lighting shall not be used during rough construction.

1.6 TEMPORARY WATER SERVICE (NOT USED)

1.7 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

1.8 FIELD OFFICES AND SHEDS (NOT USED)

1.9 VEHICULAR ACCESS

- A. Provide unimpeded access for emergency vehicles. Maintain 15 foot-wide driveways with turning space between and around combustible materials.
- B. Provide and maintain access to fire hydrants and control valves free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Use designated existing on-Site roads for construction traffic.

1.10 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

- D. Collect and remove waste materials, debris, and rubbish from Site weekly and dispose of off-Site. Comply with Section 017419 - Construction Waste Management and Disposal.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 FIRE-PREVENTION FACILITIES

- A. Prohibit smoking within buildings. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.
- B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

1.12 ENCLOSURES AND FENCING

- A. Construction: Commercial-grade chain-link fence.
- B. Provide 8-foot-high fence around construction Site as necessary when existing fence is temporarily removed for construction activities; equip with vehicular and pedestrian gates with locks.
- C. Exterior Enclosures:
 - 1. Provide temporary insulated weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.13 SECURITY

- A. Security Program:
 - 1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
 - 2. Initiate program in coordination with Owner's existing security system at Project mobilization.
 - 3. Maintain program throughout construction period until Owner's acceptance precludes need for Contractor's security.
- B. Entry Control:
 - 1. Restrict entrance of persons and vehicles to Project Site and existing facilities.
 - 2. Allow entrance only to authorized persons with proper identification.
 - 3. Maintain log of workers and visitors and make available to Owner on request.
 - 4. Owner will control entrance of persons and vehicles related to Owner's operations.
 - 5. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.
- C. Personnel Identification:
 - 1. Provide identification badge for each person authorized to enter premises.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

2. Badge to Include: Personal photograph, name, and employer.
 3. Maintain list of accredited persons and submit copy to Owner on request.
 4. Require return of badges at expiration of employment on the Work.
- D. Security Service:
1. Facility to be fenced off and locked when no workers or operator is on-site.
 2. Coordinate with Owner and operator for securing site when operator is not present.
- E. Restrictions:
1. Do no work on Sundays.
- 1.14 WATER CONTROL
- A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.
 - B. Protect Site from puddles or running water. Provide water barriers as required to protect Site from soil erosion.
- 1.15 DUST CONTROL
- A. Execute Work by methods that minimize raising dust from construction operations.
 - B. Provide positive means to prevent airborne dust from dispersing into atmosphere and into Owner-occupied areas.
- 1.16 EROSION AND SEDIMENT CONTROL
- A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - B. Minimize surface area of bare soil exposed at one time.
 - C. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.
 - D. Construct fill and waste areas by selective placement to avoid erosive surface silts and clays.
 - E. Periodically inspect earthwork to detect evidence of erosion and sedimentation. Promptly apply corrective measures.
 - F. Comply with sediment and erosion control plan indicated on Drawings.
- 1.17 NOISE CONTROL
- A. Provide methods, means, and facilities to minimize noise produced by construction operations.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

1.18 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials before Final Application for Payment inspection.
- B. Remove underground installations to minimum depth of 2 feet. Grade Site as indicated on Drawings.
- C. Clean and repair damage caused by installation or use of temporary Work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 015519 – TEMPORARY PARKING AND STAGING AREAS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Scope of Work.
- B. Description of Work.
- C. Permits and Regulations

1.2 SCOPE OF WORK

- A. During construction activities, the Contractor shall park within designated areas as determined by the Owner.
- B. Contractor shall stage equipment, materials, and field offices in staging areas designated prior to construction.

1.3 DESCRIPTION OF WORK

- A. Temporary Parking Areas:
 - 1. At the site, temporary stone with geotextile fabric may be placed in grass area(s) for additional parking areas and/or turn around areas as approved by the Owner.
 - 2. Contractor shall leave sufficient space for plant operator and other staff to park and access the site as necessary.
- B. Staging Areas:
 - 1. Contractor shall stage equipment, materials, and field offices in designated staging areas, as directed by the Owner.
- C. Restoration
 - 1. At the end of the project the Contractor shall remove all temporary parking and staging areas and restore to acceptable standards per contract documents or as directed by the Owner.

1.4 PERMITS AND REGULATIONS

- A. The Contractor shall comply with all municipal, County, State and Federal regulations relating to safety, noise and air pollution and shall apply for, obtain and pay all costs in connection with permits as may be required.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 – EXECUTION – NOT APPLICABLE

END OF SECTION

SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description
- B. Barricades and Warning Signals
- C. Tree and Plant Protection
- D. Protection of Existing Structures
- E. Protection of Floors, Roofs, and Ceilings
- F. Protection of Installed Products and Landscaping

1.2 DESCRIPTION

- A. CONTRACTOR shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.
- B. In order to prevent damage, injury or loss, CONTRACTOR'S actions shall include, but not be limited to, the following:
 - 1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
 - 2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
 - 3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
 - 4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
 - 5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.
- C. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy privately-owned land with men, tools, materials or equipment, except on easements provided herein.
- D. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored by the CONTRACTOR, at his expense, to a condition equal to that existing before the damage was done.

SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

1.3 BARRICADES AND WARNING SIGNALS

- A. Where Work is performed on or adjacent to any roadway, right-of-way, or public place, CONTRACTOR shall provide barricades, fences, lights, warning signs, danger signals, watchmen, and shall take other precautionary measures for the protection of persons or property and of the Work. Barricades shall be painted to be visible at night. From sunset to sunrise, CONTRACTOR shall furnish and maintain at least one light at each barricade. Sufficient barricades shall be erected to keep vehicles from being driven on or into Work under construction. CONTRACTOR shall furnish watchmen in sufficient numbers to protect the Work. CONTRACTOR'S responsibility for the maintenance of barricades, signs, lights, and for providing watchmen shall continue until the Project is accepted by OWNER.

1.4 TREE AND PLANT PROTECTION

- A. CONTRACTOR shall protect existing trees, shrubs and plants on or adjacent to the site that are shown or designated to remain in place against unnecessary cutting, breaking or skinning of trunk, branches, bark or roots.
- B. Materials or equipment shall not be stored or parked within the drip line.
- C. Temporary fences or barricades shall be installed to protect trees and plants in areas subject to traffic.
- D. Fires shall not be permitted under or adjacent to trees and plants.
- E. Within the limits of the work, water trees and plants that are to remain, in order to maintain their health during construction operations.
- F. Cover all exposed roots with burlap that shall be kept continuously wet. Cover all exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, run-off or noxious materials in solution.
- G. If branches or trunks are damaged, prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by the ENGINEER.
- H. All damaged trees and plants that die or suffer permanent injury shall be removed when ordered by the ENGINEER and replaced by a specimen of equal or better quality.
- I. Coordinate work in this section with requirements of Division 2 Technical Specifications.

1.5 PROTECTION OF EXISTING STRUCTURES

- A. Underground Structures:
 - 1. Underground structures are defined to include, but not be limited to, all sewer, water, gas, and other piping, and manholes, chambers, electrical conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.
 - 2. All underground structures known to ENGINEER except water, sewer, electric, and telephone service connections are shown. This information is shown for the

SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

assistance of CONTRACTOR in accordance with the best information available, but is not guaranteed to be correct or complete.

3. CONTRACTOR shall explore ahead of his trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If CONTRACTOR damages an underground structure, he shall restore it to original condition at his expense.
4. Necessary changes in the location of the Work may be made by ENGINEER, to avoid unanticipated underground structures.
5. If permanent relocation of an underground structure or other subsurface facility is required and is not otherwise provided for in the Contract Documents, ENGINEER will direct CONTRACTOR in writing to perform the Work, which shall be paid for under the provisions of Article 11 of the General Conditions.

B. Surface Structures:

1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

C. Protection of Underground and Surface Structures:

1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, CONTRACTOR shall satisfy the ENGINEER that the methods and procedures to be used have been approved by the party owning same.
2. CONTRACTOR shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits of the Work. CONTRACTOR shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. CONTRACTOR shall repair immediately all damage caused by his work, to the satisfaction of the owner of the damaged structure.

- D. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at CONTRACTOR'S expense.

1.6 PROTECTION OF FLOORS, ROOFS, AND CEILINGS

- A. CONTRACTOR shall protect floors, roofs and ceilings during the entire construction period.
- B. Proper protective covering shall be used when moving heavy equipment, handling materials or other loads, when painting, handling mortar and grout and when cleaning walls and ceilings.

SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

- C. Use metal pans to collect all oil and cuttings from pipe, conduit, or rod threading machines and under all metal cutting machines.
- D. Roofs and ceilings shall not be loaded without written permission of the ENGINEER.

1.7 PROTECTION OF INSTALLED PRODUCTS AND LANDSCAPING

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.
- B. Control traffic to prevent damage to equipment, materials and surfaces.
- C. Provide coverings to protect equipment and materials from damage.
 - 1. Cover projections, wall corners, and jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Installation data.

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- E. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Comply with delivery requirements in Section 017419 - Construction Waste Management and Disposal.
- B. Transport and handle products according to manufacturer's instructions.
- C. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- D. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.

SECTION 016000 - PRODUCT REQUIREMENTS

- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection unless otherwise approved by Owner.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 013310 - Substitution Procedures.

1.6 INSTALLATION DATA

- A. Installation data is defined as written instruction; drawings; illustrative, wiring and schematic diagrams; diagrams identifying external connections, terminal block numbers and internal wiring; and all other such information pertaining to the location of materials and equipment that is not furnished with Shop Drawings. Included are all printed manufacturers installation instructions, including those that may be attached to equipment and for which review by the Engineer is not required.
- B. Contractor shall submit two copies of all such data to the Engineer for each piece of equipment which he furnished and for all other construction products for which such information is available from the manufacturer. Data shall be acceptably identified and accompanied with a letter of transmittal.

SECTION 016000 - PRODUCT REQUIREMENTS

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Field engineering.
- B. Closeout procedures.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Testing, adjusting, and balancing.
- F. Project record documents.
- G. Operation and maintenance data.
- H. Manual for equipment and systems.
- I. Spare parts and maintenance products.
- J. Product warranties and product bonds.
- K. Maintenance service.
- L. Examination.
- M. Preparation.
- N. Execution.
- O. Cutting and patching.
- P. Protecting installed construction.
- Q. Final cleaning.

1.2 FIELD ENGINEERING

- A. Employ land surveyor registered in State of New York and acceptable to Engineer.
- B. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.
- C. Control datum for survey is per NAVD 1988 Datum and New York State Plane Coordinates as indicated on Drawings.
- D. Prior to beginning Work, verify and establish floor elevations of existing facilities to ensure that new Work will meet existing elevations in smooth and level alignment except where specifically detailed or indicated otherwise.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- E. Verify setbacks and easements; confirm Drawing dimensions and elevations.
- F. Provide field engineering services. Establish elevations, lines, and levels using recognized engineering survey practices.
- G. Submit copy of Site drawings signed by land surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.
- H. Maintain complete and accurate log of control and survey Work as Work progresses.
- I. On completion of foundation walls and major Site improvements, prepare certified survey illustrating dimensions, locations, angles, and elevations of construction and Site Work.
- J. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.
- K. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.
- L. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect/Engineer.
- M. Final Property Survey: Prior to Substantial Completion, prepare final property survey illustrating locations, dimensions, angles, and elevations of buildings and Site Work that have resulted from construction indicating their relationship to permanent bench marks and property lines.
 - 1. Show significant features (real property) for Project.
 - 2. Include certification on survey, signed by surveyor, that principal metes, bounds, lines, levels, and elevations of Project are accurately shown.

1.3 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.
 - 2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
 - 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
 - 4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
 6. Make final change-over of locks eliminating construction master-key system and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
 7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
 8. Perform final cleaning according to this Section.
- B. Substantial Completion Inspection:
1. When Contractor considers Work to be substantially complete, submit to Engineer Owner:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
 2. Within seven days after receipt of request for Substantial Completion, Engineer will make inspection to determine whether Work or designated portion is substantially complete.
 3. Should Engineer determine that Work is not substantially complete:
 - a. Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Engineer.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.
 4. When Engineer's finds that Work is substantially complete, Engineer will:
 - a. Prepare Certificate of Substantial Completion on EJCDC C-625 - Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
 5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time period stipulated.
 6. Owner will occupy all of building as specified in Section 011000 - Summary.
- C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
1. When Contractor considers Work to be complete, submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
 2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. Contractor's affidavit of payment of debts and claims on AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
 - f. Contractor affidavit of release of liens on AIA G706A - Contractor's Affidavit of Release of Liens.
 - g. Consent of surety to final payment on AIA G707 - Consent of Surety to Final Payment Form.
3. Perform final cleaning for Contractor-soiled areas according to this Section.
- D. Final Completion Inspection:
1. Within seven days after receipt of request for final inspection, Engineer will make inspection to determine whether Work or designated portion is complete.
 2. Should Engineer consider Work to be incomplete or defective:
 - a. Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Engineer that Work is complete.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.

1.4 STARTING OF SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Engineer and Owner seven days prior to startup of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.
- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.
- H. Submit a written report according to Section 013300 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate Project equipment and instruct in classroom environment located at Waste Water Treatment Facility and instructed by manufacturer's representative who is knowledgeable about the Project.
- C. Video Recordings: Provide high-quality color video recordings of demonstration and instructional sessions. Engage commercial videographer to record sessions. Include classroom instructions, demonstrations, board diagrams, and other visual aids. Include menu navigation.
- D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- H. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

2. Product substitutions or alternates used.
 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
 2. Include locations of concealed elements of the Work.
 3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
 4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
 5. Identify and locate existing buried or concealed items encountered during Project.
 6. Measured depths of foundations in relation to finish main floor datum.
 7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 9. Field changes of dimension and detail.
 10. Details not on original Drawings.
- G. Submit marked-up paper copy documents to Engineer before Substantial Completion.
- H. Submit final PDF electronic files of documents to Engineer with claim for final Application for Payment.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
 2. Part 2: Operation and maintenance instructions, arranged by process flow and subdivided by Specification Section. For each category, identify names,

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

addresses, and telephone numbers of Subcontractors and suppliers. Include the following:

- a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - g. Safety precautions to be taken when operating and maintaining or working near equipment.
3. Part 3: Project documents and certificates, including the following:
- a. Shop Drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties.

1.8 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.
- B. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes before Substantial Completion. Draft copy be reviewed and returned after Substantial Completion, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit three sets of revised final volumes within ten days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- F. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom-manufactured products.
- G. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- H. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- I. Additional Requirements: As specified in individual product Specification Sections.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- J. Include listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.9 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes before Substantial Completion. Draft copy will be reviewed and returned after Substantial Completion, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit three sets of revised final volumes within ten days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- F. Each Item of Equipment and Each System: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- G. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.
- H. Include color-coded wiring diagrams as installed.
- I. Operating Procedures: Include startup, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.
- J. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- K. Include servicing and lubrication schedule and list of lubricants required.
- L. Include manufacturer's printed operation and maintenance instructions.
- M. Include sequence of operation by controls manufacturer.
- N. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- O. Include control diagrams by controls manufacturer as installed.
- P. Include Contractor's coordination drawings with color-coded piping diagrams as installed.

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- Q. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- R. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- S. Include test and balancing reports as specified in Section 014000 - Quality Requirements.
- T. Additional Requirements: As specified in individual product Specification Sections.
- U. Include listing in table of contents for design data with tabbed dividers and space for insertion of data.

1.10 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.
- B. Deliver to place in location as directed by Owner; obtain receipt prior to final payment.

1.11 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.12 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in Specification Sections during warranty period.

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- B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.
- D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Specification Sections.
- D. Verify that utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.3 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect/Engineer for final decision.
- E. Allow for expansion of materials and building movement.
- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
1. Refer questionable mounting heights choices to Architect/Engineer for final decision.
 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- H. Adjust operating products and equipment to ensure smooth and unhindered operation.
- I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 CUTTING AND PATCHING

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight-exposed elements.
 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed Work.
 3. Remove and replace defective and nonconforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products according to requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. At penetrations of fire-rated walls, partitions, ceiling, or floor construction, completely seal voids with fire-rated material according to Section 078400 - Firestopping, to full thickness of penetrated element.
- J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- K. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

3.5 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

3.6 FINAL CLEANING

- A. Execute final cleaning prior to final Project assessment.
 - 1. Employ experienced personnel or professional cleaning firm.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces.
- C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- D. Replace filters of operating equipment.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean Site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION

SECTION 030100 - MAINTENANCE OF CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Epoxy adhesive injection materials.
 - 2. Epoxy mortar materials and mixing.
 - 3. Cementitious mortar materials and mixing.
 - 4. Reinforcement materials.

1.2 UNIT PRICES

- A. Surface Repair:
 - 1. Basis of Measurement: By square foot.
 - 2. Basis of Payment: Includes surface preparation, concrete repair, and finishing.

1.3 SUBMITTALS

- A. Product Data: Product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.
- B. Manufacturer's Certificate: Products meet or exceed specified requirements.
- C. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.
- D. Manufacturer Instructions: Mixing requirements.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Qualifications Statements:
 - 1. Qualifications for manufacturer, applicator, and licensed professional.
 - 2. Manufacturer's approval of applicator.
 - 3. Welders: Qualify procedures and personnel according to AWS D1.1/D1.1M.

1.4 QUALITY ASSURANCE

- A. Welding: Comply with AWS D1.4/D1.4M.
- B. Perform Work according to New York State Building Code standards.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- D. Applicator: Company specializing in performing Work of this Section with three years' experience and approved by manufacturer.
- E. Welders: AWS qualified within previous 12 months for employed weld types.

SECTION 030100 - MAINTENANCE OF CONCRETE

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials according to manufacturer instructions.
- B. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.6 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 EPOXY ADHESIVE

- A. Manufacturers:
 - 1. ChemCo Systems.
 - 2. ChemMasters, Inc.
 - 3. Dayton Superior.
 - 4. Euclid Chemical Company (The); an RPM company.
 - 5. Kaufman Products, Inc.
 - 6. MAPEI Corporation.
 - 7. Master Builders Solutions.
 - 8. Sika Corporation.
 - 9. Sto Corp.
 - 10. Unitex by Dayton Superior.
 - 11. US SPEC, Division of US MIX Company.
 - 12. W.R. Meadows, Inc.
 - 13. Substitutions: Permitted
- B. Description:
 - 1. Type: Two-part.
 - 2. Solids Content: 100 percent.
- C. Minimum Characteristics:
 - 1. Bond Strength:
 - a. 2,700 psi.
 - b. Comply with ASTM C882/C882M.
 - 2. Tensile Strength:
 - a. 6,600 psi.
 - b. Comply with ASTM D638.
 - 3. Elongation:
 - a. 2 percent at seven days at 70 deg. F.
 - b. Comply with ASTM D638.
 - 4. Flexural Strength:
 - a. 8,000 psi.

SECTION 030100 - MAINTENANCE OF CONCRETE

2.2 EPOXY MORTAR

- A. Manufacturers:
 - 1. Euclid Chemical Company (The); an RPM company.
 - 2. Sika Corporation.
 - 3. Substitutions: Permitted
- B. Description:
 - 1. Type: Three-part binding resin and aggregate mortar mixture.
- C. Binding Resin:
 - 1. Two-part epoxy resin.
 - 2. Solids Content: 100 percent.
 - 3. Minimum Characteristics:
 - a. Bond Strength:
 - 1) 2,700 psi.
 - 2) Comply with ASTM C882.
 - b. Tensile Strength:
 - 1) 6,600 psi.
 - 2) Comply with ASTM D638.
 - c. Elongation:
 - 1) 2 percent at seven days at 70 deg. F.
 - 2) Comply with ASTM D638.
 - d. Flexural Strength:
 - 1) 8,000 psi.
 - 2) Comply with ASTM D790.
 - e. Compressive Strength:
 - 1) 6,500 psi.
 - 2) Comply with ASTM D695.
- D. Aggregate Type: As recommended by mortar manufacturer.

2.3 CEMENTITIOUS MORTAR

- A. Manufacturers:
 - 1. CGM, Incorporated.
 - 2. ChemMasters, Inc.
 - 3. Dayton Superior.
 - 4. Euclid Chemical Company (The); an RPM company.
 - 5. Fox Industries, Inc.
 - 6. Kaufman Products, Inc.
 - 7. Master Builders Solutions.
 - 8. Sika Corporation.
 - 9. Sto Corp.
 - 10. Unitex by Dayton Superior.
 - 11. US SPEC, Division of US MIX Company.
 - 12. W.R. Meadows, Inc.
 - 13. Substitutions: Permitted
- B. Description: Packaged hydraulic-cement patching mortar.

SECTION 030100 - MAINTENANCE OF CONCRETE

- C. Minimum Characteristics:
 - 1. Compressive Strength:
 - a. 2,000 psi after one day and 5,000 psi after 28 days.
 - b. Comply with ASTM C109/C109M.
 - 2. Bond Strength:
 - a. 2,500 psi after 28 days.
 - b. Comply with ASTM C882/C882M ,
 - 3. Flexural Strength:
 - a. 1,500 psi after 28 days.
 - b. Comply with ASTM C293/C293M.
- D. Sand:
 - 1. Description: Uniformly graded and clean.
 - 2. Comply with ASTM C33/C33M
- E. Water: Clean and potable.
- F. Air Entrainment Admixture: Comply with ASTM C260/C260M.
- G. Calcium Chloride: Not permitted.
- H. Bonding Agent:
 - 1. Description:
 - a. Dispersed in water while mixing and non-coagulant in mix.
 - b. Water resistant when cured.
 - 2. Emulsion: Polyvinyl acetate
- I. Cleaning Agent:
 - 1. Commercial muriatic acid.

2.4 REINFORCEMENT MATERIALS

- A. Reinforcing Steel:
 - 1. Description: Deformed billet bars.
 - 2. Yield Grade: 60 ksi.
 - 3. Comply with ASTM A615/A615M.
 - 4. Finish: Uncoated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive Work.

3.2 PREPARATION

- A. Cleaning:
 - 1. Clean concrete surfaces of dirt, laitance, corrosion, and other contamination.
 - 2. Scrub with wire brush using acid.
 - 3. Rinse surface and allow to dry.
 - 4. Flush out cracks and voids with muriatic acid to remove laitance and dirt.

SECTION 030100 - MAINTENANCE OF CONCRETE

5. Chemically neutralize by rinsing with water.
- B. Ports:
 1. Provide temporary entry ports spaced to facilitate movement of fluids between ports.
 2. Size: Not deeper than depth of crack to be filled, or diameter not greater than thickness of crack.
- C. Provide temporary seal at concrete surface to prevent leakage of adhesive.
- D. Remove broken and soft concrete 1/4 inch deep and remove corrosion from steel.
- E. Clean surfaces mechanically, wash with acid and rinse with water.
- F. Reinforcement:
 1. Sandblast exposed reinforcement steel surfaces.
 2. Mechanically cut away damaged portions of bar.

3.3 MIXES

- A. Epoxy Mortar:
 1. Mix to consistency for intended purpose.
 2. Mix components in clean equipment or containers.
 3. Comply with pot life and workability limits.
- B. Cementitious Mortar:
 1. Mix to consistency required for intended purpose.
 2. Exclude bonding agent as additive to mix.

3.4 APPLICATION

- A. Repairs:
 1. Reinforcement: Weld new bar reinforcement to existing reinforcement with sleeve splices
 2. Apply surface finish.
- B. Epoxy Resin Injection:
 1. Inject epoxy-resin adhesive into prepared ports under pressure, using equipment appropriate for particular application.
 2. Begin injection at lower entry port and continue until adhesive appears in adjacent entry port, continuing from port to port until entire crack is filled.
 3. Remove temporary seal and excess adhesive.
 4. Clean surfaces adjacent to repair and blend finish.
- C. Epoxy Mortar:
 1. Trowel-apply mortar mix to average thickness of 2 inches and tamp into place, filling voids at spalled areas.
 2. Patching of Honeycombed Areas:
 - a. Trowel mortar onto surface, and work mortar into honeycomb to bring surface flush with surrounding area.
 - b. Finish trowel surface to match surrounding area.

SECTION 030100 - MAINTENANCE OF CONCRETE

3. Cover exposed steel reinforcement with epoxy mortar and feather edges to flush surface.
- D. Cementitious Mortar:
1. Bonding Agent:
 - a. Apply sprayed coating to damp concrete surfaces.
 - b. Provide full surface coverage.
 2. Steel trowel to average thickness of 2 inches and tamp into place, filling voids at spalled areas.
 3. Work mix into honeycombed areas.
- E. Damp cure cementitious mortar for four days.
- 3.5 FIELD QUALITY CONTROL
- A. Test concrete for calcium chloride content during execution of the Work.

END OF SECTION

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

1.1 SUMMARY

- A. Section Includes:
 - 1. Formwork for cast-in-place concrete.
 - 2. Shoring, bracing, and anchorage.
 - 3. Architectural form liners.
 - 4. Form accessories.
 - 5. Form stripping.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Formwork, shoring, and reshoring.
 - 2. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
 - 3. Means of leakage prevention for concrete exposed to view in finished construction.
 - 4. Sequence and timing of erection and stripping, assumed compressive strength at time of stripping, height of lift, and height of drop during placement.
 - 5. Vertical, horizontal, and special loads according to ACI 347, and camber diagrams if applicable.
 - 6. Notes to formwork erector showing size and location of conduits and piping embedded in concrete according to ACI 318.
 - 7. Procedure and schedule for removal of shores and installation and removal of reshores.

1.3 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. For wood products furnished for Work of this Section, comply with AF&PA.
- C. Perform Work according to New York State Building Code standards.
- D. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of New York

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Design, engineer, and construct formwork, shoring, and bracing according to ACI 318 to conform to design and applicable code requirements to achieve concrete shape, line, and dimension as indicated.

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

- B. Vapor Retarder Permeance: Maximum 1 perm when tested according to ASTM E96, desiccant method.

2.2 WOOD FORM MATERIALS

- A. Form Materials: At discretion of Contractor.

2.3 PREFABRICATED FORMS

- A. Manufacturers:

1. EFCO - Economy Forms Corp.
2. Molded Fiber Glass Construction Products.
3. Sonoco Products Co.
4. Symons by Dayton Superior.
5. Wall-Ties & Forms, Inc.
6. Western Forms.
7. Substitutions: Permitted

- B. Preformed Steel Forms:

1. Description: Matched, tightly fitted, and stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
2. Minimum Thickness: 16 gage.

- C. FRP Forms: Matched, tightly fitted, and stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.

- D. Pan:

1. Material: Steel
2. Configuration: Size and profile as required.

- E. Steel Forms:

1. Description: Sheet steel, suitably reinforced.
2. Design: For particular use as indicated.

- F. Form Liners: Smooth, durable, grainless, and non-staining hardboard unless otherwise indicated on Drawings.

- G. Framing, Studding, and Bracing: Stud or No. 3 structural light-framing grade.

2.4 COATINGS

- A. Coatings for Aluminum:

1. Polyamide epoxy finish coat with paint manufacturer's recommended primer for aluminum substrate.
2. One coat primer and one coat finish.
3. Manufacturers:
 - a. H&C® Decorative Concrete Products; a brand of Sherwin-Williams Co.
 - b. Increte Systems Inc.
 - c. Sauereisen.
 - d. Substitutions: Permitted

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

2.5 FORMWORK ACCESSORIES

- A. Form Ties:
 - 1. Type: Cone.
 - 2. Material: Galvanized.
 - 3. Length: Fixed
 - 4. Furnish waterproofing washer.
 - 5. Free of defects capable of leaving holes larger than ¼ inches in concrete surface.
 - 6. Manufacturers:
 - a. Heckmann Building Products, Inc.
 - b. Symons by Dayton Superior.
 - c. Wall-Ties & Forms, Inc.
 - d. Substitutions: Permitted

- B. Spreaders:
 - 1. Description: Standard, non-corrosive metal-form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face.
 - 2. Wire ties, wood spreaders, or through bolts are not permitted.

- C. Form Release Agent:
 - 1. Description: Colorless mineral oil that will not stain concrete or absorb moisture
 - 2. Manufacturers:
 - a. Architectural Concrete Chemicals, LLC.
 - b. Nox-Crete Products Group.
 - c. Substitutions: Permitted

- D. Corners:
 - 1. Type: Chamfer,
 - 2. Size: 1 by 1 inches.
 - 3. Lengths: Maximum possible.
 - 4. Manufacturers:
 - a. BoMetals, Inc.
 - b. Wall-Ties & Forms, Inc.
 - c. Substitutions: Permitted

- E. Dovetail Anchor Slot:
 - 1. Material: Galvanized steel.
 - 2. Thickness: 22 gage.
 - 3. Filling: Foam
 - 4. Fasten slot to concrete formwork according to manufacturer instructions, and insert foam filler to prevent concrete from entering slot during pour.
 - 5. Manufacturers:
 - a. BoMetals, Inc.
 - b. Dur-O-Wal; a Hohmann & Barnard company.
 - c. Heckmann Building Products, Inc.
 - d. Substitutions: Permitted

- F. Flashing Reglets:
 - 1. Material: Rigid PVC.
 - 2. Thickness: 22 gage.
 - 3. Lengths: Maximum possible.

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

4. Furnish alignment splines for joints.
 5. Filling: Foam
 6. Fasten flashing reglet to concrete formwork according to manufacturer instructions, and insert foam to prevent concrete from entering reglet during pour.
 7. Manufacturers:
 - a. Cheney Flashing Company.
 - b. Fry Reglet Corporation.
 - c. Heckmann Building Products, Inc.
 - d. Hohmann & Barnard, Inc.
 - e. O'Keeffe's Inc.
 - f. W. P. Hickman Systems, Inc.
 - g. Substitutions: Permitted
- G. Vapor Retarder:
1. Description: Polyethylene sheet.
 2. Thickness: 8 mils.
- H. Bituminous Joint Filler: Comply with ASTM D1751.
- I. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength, and character to maintain formwork in place while placing concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels, and centers before proceeding with formwork.
- B. Verify that dimensions agree with Drawings
- C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect/Engineer before proceeding.

3.2 INSTALLATION

- A. Earth Forms: Not permitted.
- B. Formwork:
 1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
 2. Positioning:
 - a. Verify horizontal and vertical positions of forms.
 - b. Correct misaligned or misplaced forms before placing concrete.
 3. Complete wedging and bracing before placing concrete.
 4. Erect formwork, shoring, and bracing to achieve design requirements according to ACI 318.
 5. Stripping:
 - a. Arrange and assemble formwork to permit dismantling and stripping.
 - b. Permit removal of remaining principal shores.

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

6. Obtain approval of Architect/Engineer before framing openings in structural members not indicated on Drawings.
 7. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view.
 8. Do not patch formwork.
 9. Leave forms in place for minimum number of days according to ACI 347.
- C. Form Removal:
1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads, and removal has been approved by Architect/Engineer.
 2. Form Release Agent:
 - a. Apply according to manufacturer instructions.
 - b. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
 - c. Soak inside surfaces of untreated forms with clean water, and keep surfaces coated prior to placement of concrete.
 3. Form Cleaning:
 - a. Clean formed cavities of debris prior to placing concrete.
 - b. Flush with water or use compressed air to remove remaining foreign matter.
 - c. During cold weather, remove ice and snow from within forms without using de-icing salts, and use compressed air or other dry method to remove foreign matter.
 4. Reuse and Coating of Forms:
 - a. Thoroughly clean forms and reapply form coating before each reuse.
 - b. For exposed Work, do not reuse forms with damaged faces or edges.
 - c. Apply form coating to forms according to manufacturer instructions.
 - d. Do not coat forms for concrete indicated to receive "scored finish."
 - e. Apply form coatings before placing reinforcing steel.
- D. Framing, Studding, and Bracing:
1. Maximum Spacing of Studs:
 - a. Boards: Maximum 16 inches o.c.
 - b. Plywood: 12 inches o.c.
 2. Size framing, bracing, centering, and supporting members for sufficient strength to maintain shape and position under imposed loads from construction operations.
 3. Construct beam soffits of material minimum 2 inches thick.
 4. Distribute bracing loads over base area on which bracing is erected.
- E. Form Anchors and Hangers:
1. Do not use anchors and hangers leaving exposed metal at concrete surface.
 2. Symmetrically arrange hangers supporting forms from structural-steel members to minimize twisting or rotation of member.
 3. Penetration of structural-steel members is not permitted.
- F. Inserts, Embedded Parts, and Openings:
1. Install formed openings for items to be embedded in or passing through concrete Work.
 2. Locate and set in place items required to be cast directly into concrete.

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

3. Joints:
 - a. Install waterstops continuous without displacing reinforcement.
 4. Provide temporary ports or openings at bottom of formwork as required to facilitate cleaning and inspection.
 5. Close temporary openings with tight-fitting panels, flush with inside face of forms, and neatly fitted such that joints will not be apparent in exposed concrete surfaces.
- G. Form Ties:
1. Provide sufficient strength and quantity to prevent spreading of forms.
 2. Place ties at least 2 inches away from finished surface of concrete.
 3. Leave inner rods in concrete when forms are stripped.
 4. Space form ties equidistant, symmetrical, and aligned vertically and horizontally unless indicated otherwise on Drawings.
- H. Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- I. Construction Joints:
1. Install surfaced pouring strip where construction joints intersect on exposed surfaces to provide straight line at joints.
 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
 3. Appearance:
 - a. Show no overlapping of construction joints.
 - b. Construct joints to present same appearance as butted plywood joints.
- J. Embedded Items:
1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, waterstops, and other features.
 2. Do not embed wood or uncoated aluminum in concrete.
 3. Obtain installation and setting information for embedded items furnished under other Sections.
 4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
 5. Ensure that conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 regarding size and location limitations.
- K. Openings for Items Passing through Concrete:
1. Frame openings in concrete where indicated on Drawings.
 2. Establish exact locations, sizes, and other conditions required for openings and attachment of Work specified under other Sections.
 3. Coordinate Work to avoid cutting and patching of concrete after placement.
 4. Perform cutting and repairing of concrete required as result of failure to provide required openings.
- L. Screeds:
1. Set screeds and establish levels for tops of and finish on concrete slabs.
 2. Slope slabs to drain as required or as indicated.

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

- M. Screed Supports:
 - 1. For concrete over waterproof membranes and vapor retarder membranes, use cradle-, pad-, or base-type screed supports that will not puncture membrane.
 - 2. Staking through membrane is not permitted.
- N. Cleanouts and Access Panels:
 - 1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris, and waste material.
 - 2. Thoroughly blow out forms with compressed air just before concrete is placed.

3.3 TOLERANCES

- A. Construct formwork to maintain tolerances according to ACI 318.
- B. Camber:
 - 1. According to ACI 318.

3.4 FIELD QUALITY CONTROL

- A. Inspection:
 - 1. Inspect erected formwork, shoring, and bracing to ensure that Work complies with formwork design and that supports, fastenings, wedges, ties, and items are secure.
 - 2. Notify Architect/Engineer after placement of reinforcing steel in forms but prior to placing concrete.
 - 3. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Reinforcing bars.
 - 2. Welded wire fabric.
 - 3. Reinforcement accessories.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Bar sizes, spacings, locations, splice locations, and quantities of reinforcing steel and welded wire fabric.
 - 2. Bending and cutting schedules.
 - 3. Supporting and spacing devices.
- B. Manufacturer's Certificate: Products meet or exceed specified requirements.
- C. Submit certified copies of mill test report of reinforcement materials analysis.
- D. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.

1.3 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. Prepare Shop Drawings according to ACI SP-66.
- C. Perform Work according to New York State Building Code standards.
- D. Welders: AWS qualified within previous 12 months for employed weld types.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials according to manufacturer instructions.
- B. Protection:
 - 1. Protect materials from moisture by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.5 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

SECTION 032000 - CONCRETE REINFORCING

PART 2 - PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel:
 - 1. Comply with ASTM A615.
 - 2. Yield Strength: 60 ksi.
 - 3. Billet Bars: Deformed.
 - 4. Finish: Uncoated
- B. Welded Deformed Wire Fabric:
 - 1. Comply with ASTM A1064.
 - 2. Configuration: Flat sheets
 - 3. Finish: Uncoated

2.2 FABRICATION

- A. Fabricate concrete reinforcement according to ACI 318
- B. Form standard hooks for 90-degree bends as indicated.
- C. Form reinforcement bends with minimum diameters according to ACI 318
- D. Weld reinforcement according to AWS D1.4.
- E. Splicing:
 - 1. If not indicated on Drawings, locate reinforcement splices at point of minimum stress.
 - 2. Obtain approval of splice locations from Engineer.

2.3 ACCESSORY MATERIALS

- A. Tie Wire:
 - 1. Minimum 16 gage, annealed type
- B. Chairs, Bolsters, Bar Supports, and Spacers:
 - 1. Size and Shape: To strengthen and support reinforcement during concrete placement conditions.
- C. Special Chairs, Bolsters, Bar Supports, and Spacers Adjacent to Weather-Exposed Concrete Surfaces:
 - 1. Material: Plastic-coated steel.
 - 2. Size and Shape: To meet Project conditions.
- D. Reinforcing Splicing Devices:
 - 1. Type: Mechanical threaded; full tension and compression.
 - 2. Size: To fit joined reinforcing.
 - 3. Manufacturers:
 - a. Dur-O-Wal; a Hohmann & Barnard company.
 - b. ERICO; nVent.
 - c. Symons by Dayton Superior.

SECTION 032000 - CONCRETE REINFORCING

- d. Substitutions: Permitted

2.4 SOURCE QUALITY CONTROL

- A. Certificate of Compliance:
 - 1. If fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 - 2. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Place, support, and secure reinforcement against displacement.
- B. Do not weld crossing reinforcement bars for assembly
- C. Spacing:
 - 1. Space reinforcement bars with minimum clear spacing according to ACI 318
 - 2. If bars are indicated in multiple layers, place upper bars directly above lower bars.
- D. Maintain minimum concrete cover around reinforcement according to ACI 318 as follows:
 - 1. Footings and Concrete Formed against Earth: 3 inches.
 - 2. Concrete Exposed to Earth or Weather:
 - a. No. 6 Bars and Larger: 2 inches
 - b. No. 5 Bars and Smaller: 1-1/2 inches
 - 3. Supported Slabs, Walls, and Joists:
 - a. No. 14 Bars and Larger: 1-1/2 inches
 - b. No. 11 Bars and Smaller: 3/4 inch
 - 4. Beams and Columns: 1-1/2 Inches
- E. Splice reinforcing where indicated on Drawings according to manufacturer instructions.
- F. Bond and ground reinforcement as specified in Section 260526 - Grounding and Bonding for Electrical Systems

3.2 TOLERANCES

- A. Install reinforcement within following tolerances for flexural members, walls, and compression members:
 - 1. Reinforcement Depth Greater Than 8 inches:
 - a. Depth Tolerance: Plus or Minus 3/8 inch
 - 2. Reinforcement Depth Less Than or Equal to 8 inches:
 - a. Depth Tolerance: Plus or Minus 1/2 inch
- B. Foundation Walls: Comply with ACI 530/530.1.

SECTION 032000 - CONCRETE REINFORCING

3.3 FIELD QUALITY CONTROL

- A. Perform field inspection and testing according to New York State Building Code.
- B. Provide unrestricted access to Work and cooperate with appointed inspection and testing firm.
- C. Reinforcement Inspection:
 - 1. Placement Acceptance: Inspect specified and ACI 318 material requirements and specified placement tolerances.
 - 2. Welding: Inspect welds according to AWS D1.1.
 - 3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
 - 4. Weldability Inspection: Inspect for reinforcement weldability if formed from steel other than ASTM A706.
 - 5. Continuous Weld Inspection: Inspect reinforcement according to ACI 318
 - 6. Periodic Weld Inspection: Inspect other welded connections.

END OF SECTION

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete for the following:
 - 1. Slabs on grade.
 - 2. Control, expansion and contraction joint devices.
 - 3. Equipment pads.

- B. Related Sections:
 - 1. Section 031000 - Concrete Forming and Accessories.
 - 2. Section 032000 - Concrete Reinforcing.
 - 3. Section 033500 - Concrete Finishing.
 - 4. Section 033900 - Concrete Curing.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 305 - Hot Weather Concreting.
 - 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 - 4. ACI 308.1 - Standard Specification for Curing Concrete.
 - 5. ACI 318 - Building Code Requirements for Structural Concrete.
 - 6. ACI 350 – Code Requirements for Environmental Engineering Concrete Structures.

- B. ASTM International:
 - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 3. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 4. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 5. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 6. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 - 7. ASTM C150 - Standard Specification for Portland Cement.
 - 8. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
 - 9. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - 10. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - 11. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 - 12. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
 - 13. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
 - 14. ASTM C595 - Standard Specification for Blended Hydraulic Cements.

SECTION 033000 - CAST-IN-PLACE CONCRETE

15. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
16. ASTM C685/C685M - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.
17. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
18. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
19. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
20. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
21. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
22. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
23. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
24. ASTM C1218/C1218M - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
25. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
26. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
27. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
28. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
29. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
30. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
31. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
32. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
33. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on joint devices, attachment accessories, admixtures and.
- C. Design Data:
 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 2. Identify mix ingredients and proportions, including admixtures.

SECTION 033000 - CAST-IN-PLACE CONCRETE

3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
 - D. Samples: Submit two 9 x 12 inch long samples of expansion/contraction joint and control joint.
 - E. Manufacturer's Installation Instructions: Submit installation procedures and interface required with adjacent Work.
- 1.4 CLOSEOUT SUBMITTALS
- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
 - B. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction.
- 1.5 QUALITY ASSURANCE
- A. Perform Work in accordance with ACI 318 and ACI 350.
 - B. Conform to ACI 305 when concreting during hot weather.
 - C. Conform to ACI 306.1 when concreting during cold weather.
 - D. Acquire cement and aggregate from one source for Work.
- 1.6 ENVIRONMENTAL REQUIREMENTS
- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
 - B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days.
- 1.7 COORDINATION
- A. Section 013105 – Project Management and Coordination: Coordination and project conditions.
 - B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type II – Moderate, or Type IIA - Air Entraining Portland type.
- B. Normal Weight Aggregates: ASTM C33.
 1. Coarse Aggregate Maximum Size: In accordance with ACI 318.
- C. Water: ACI 318; potable, without deleterious amounts of chloride ions.

SECTION 033000 - CAST-IN-PLACE CONCRETE

2.2 ADMIXTURES

- A. Manufacturers:
 - 1. BASF Construction Chemical.
 - 2. Euclid Chemical Co.
 - 3. Grace Construction Products.
 - 4. Sika Corporation.
 - 5. Substitutions: Permitted.
- B. Air Entrainment: ASTM C260.
- C. Chemical: ASTM C494/C494M.
- D. Plasticizing: ASTM C1017/C1017M.

2.3 ACCESSORIES

- A. Bonding Agent:
 - 1. Manufacturers:
 - a. Euclid Chemical Company.
 - b. Sika Corporation.
 - c. W.R. Meadows, Inc.
 - d. Substitutions: Section 016000 - Product Requirements.
- B. Non-Shrink Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.
 - 1. Manufacturers:
 - a. Euclid Chemical Co.
 - b. L&M Construction Chemical.
 - c. QUIKRETE.
 - d. Sika Corporation.
 - e. Substitutions: Section 016000 - Product Requirements.

2.4 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler Type C: ASTM D1752; Premolded sponge rubber.
- B. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; of longest manufactured length at each location, recessed mounted; color as selected.

2.5 VAPOR BARRIER

- A. Vapor barrier shall be 6 mil polyethylene sheets applied in the widest practicable width with all seams lapped a minimum of 6 (6) inches, and secured in place.

2.6 CONCRETE MIX

- A. Select proportions for concrete in accordance with ACI 318 trial mixtures.

SECTION 033000 - CAST-IN-PLACE CONCRETE

B. Provide concrete to the following criteria:

Material and Property	Measurement
Compressive Strength (28 day)	4,500 psi
Cement Type	ASTM C150
Cement Content (minimum)	606 pounds/cu yd
Aggregate Type	Normal weight
Fine Aggregate	36 percent by volume
Water-Cement Ratio (maximum)	0.46 by weight
Air Content	6.5 percent plus or minus 1.5 percent
Fly Ash Content:	20 percent of cementitious materials by weight, maximum
Silica Fume Content:	0 percent of cementitious materials by weight, maximum
Slag	0 percent of cementitious materials by weight, maximum
Slump	3 inches plus or minus 1 inch

C. Admixtures: Include admixture types and quantities indicated in concrete mix designs only when approved by Engineer.

1. Use accelerating admixtures in cold weather. Use of admixtures will not relax cold weather placement requirements.
2. Do not use calcium chloride nor admixtures containing calcium chloride.
3. Use set retarding admixtures during hot weather.
4. Add air entrainment admixture to concrete mix for work exposed to freezing and thawing or deicing chemicals.
5. For concrete exposed to deicing chemicals, limit fly ash, pozzolans, silica fume, and slag content as required by applicable code.

D. Average Compressive Strength Reduction: Permitted in accordance with ACI 318.

E. Ready Mixed Concrete: Mix and deliver concrete in accordance with ASTM C94/C94M.

F. Site Mixed Concrete: Mix concrete in accordance with ACI 318.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013105 – Project Management and Coordination.

B. Verify requirements for concrete cover over reinforcement.

C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

SECTION 033000 - CAST-IN-PLACE CONCRETE

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 318 and ACI 350.
- B. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, are not disturbed during concrete placement.
- D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by taping edges and ends.
- E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.
- G. Install construction joint devices in coordination with pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor and wall finish.
- I. Install joint covers in longest practical length, when adjacent construction activity is complete.
- J. Deposit concrete at final position. Prevent segregation of mix.
- K. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- L. Consolidate concrete.
- M. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- N. Place concrete continuously between predetermined expansion, control, and construction joints.

SECTION 033000 - CAST-IN-PLACE CONCRETE

3.4 CONCRETE FINISHING

- A. Provide formed concrete surfaces to be left exposed with smooth rubbed finish.
- B. Finish concrete floor surfaces in accordance with ACI 318.
- C. Steel trowel surfaces which are indicated to be exposed.
- D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/4 inch per foot nominal.

3.5 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
 - 1. Protect concrete footings from freezing for minimum seven days.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Cure concrete floor surfaces as specified in Section 033900 – Concrete Curing.

3.6 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Field inspection and testing will be performed by Contractor's testing laboratory in accordance with New York State Building Code.
- C. Provide free access to Work and cooperate with subcontracted firm.
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- E. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- F. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
 - 3. Sample concrete and make one set of five cylinders for every 75 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.
 - 4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.
 - 5. Make one additional cylinder during cold weather concreting, and field cure.

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- G. Field Testing:
1. Slump Test Method: ASTM C143/C143M.
 2. Air Content Test Method: ASTM C173/C173M.
 3. Temperature Test Method: ASTM C1064/C1064M.
 4. Measure slump and temperature for each compressive strength concrete sample.
 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- H. Cylinder Compressive Strength Testing:
1. Test Method: ASTM C39/C39M.
 2. Test Acceptance: In accordance with ACI 318.
 3. Test one cylinder at 7 days.
 4. Test two cylinders at 28 days.
 5. Test one cylinder at 14 days.
 6. Retain one cylinder for 56 days for testing when requested by Engineer.
 7. Dispose remaining cylinders when testing is not required.
- I. Core Compressive Strength Testing:
1. Sampling and Testing Procedures: ASTM C42/C42M.
 2. Test Acceptance: In accordance with ACI 318.
 3. Drill three cores for each failed strength test from concrete represented by failed strength test.
- J. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.7 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections as directed by Engineer.

3.8 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

END OF SECTION

SECTION 033500 - CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Finishing concrete floors
 - 2. Floor surface treatment.

1.2 SUBMITTALS

- A. Product Data: Manufacturer information on sealer, curing compounds, slip-resistant treatment, compatibilities, and limitations.
- B. Manufacturer's Certificate: Products meet or exceed specified requirements.
- C. Qualifications Statements:
 - 1. Qualifications for manufacturer and applicator installer.
 - 2. Manufacturer's approval of applicator installer.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit information on maintenance renewal of applied coatings

1.4 QUALITY ASSURANCE

- A. Perform Work according to ACI 301 and 302.1.
- B. Perform Work according to New York State Building Code standards.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- D. Installer: Company specializing in performing Work of this Section with three years' experience

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials according to manufacturer instructions.
- B. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.6 AMBIENT CONDITIONS

- A. Temporary Lighting:
 - 1. Light Source: Minimum 200 W.
 - 2. Quantity: One for each 425 sq. ft. of floor being finished.
 - 3. Placement: 8 feet above floor surface.

SECTION 033500 - CONCRETE FINISHING

- B. Temporary Heat: Maintain minimum ambient temperature of 50 deg. F.
- C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources from affecting personnel or concrete.

PART 2 - PRODUCTS

2.1 COMPOUNDS - HARDENERS AND SEALERS

- A. Sealer:
 - 1. Manufacturers:
 - a. ChemTec International.
 - b. Euclid Chemical Company (The); an RPM company.
 - c. Vexcon Chemicals Inc.
 - d. Substitutions: Permitted

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that floor surfaces are acceptable to receive Work of this Section.

3.2 APPLICATION

- A. Concrete Floor Finishing:
 - 1. Comply with ACI 301 and ACI 302.1.
 - 2. Steel-trowel surfaces which are indicated to be exposed.
 - 3. Floor Drains:
 - a. In areas with floor drains, maintain design floor elevation at walls.
 - b. Slope surfaces uniformly to drains as indicated.
- B. Floor Surface Treatment:
 - 1. Apply sealer on floor surfaces

3.3 TOLERANCES

- A. Maximum Variation of Surface Flatness for Exposed Concrete Floors: 1/8 inch in 10 feet.

3.4 FIELD QUALITY CONTROL

- A. Acceptance:
 - 1. Areas requiring corrective Work will be identified by Engineer.
 - 2. Correct defects in defined traffic floor by grinding or removal and replacement of defective Work.
 - 3. Remeasure corrected areas by procedure as specified in TOLERANCES Article.

END OF SECTION

SECTION 033900 - CONCRETE CURING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Initial and final curing of horizontal and vertical concrete surfaces.

1.2 SUBMITTALS

- A. Product Data: Manufacturer's information on curing compounds, mats, paper, and film, including compatibilities and limitations.
- B. Manufacturer's Certificate: Products meet or exceed specified requirements.
- C. Manufacturer Instructions: Installation requirements, including storage and handling procedures.
- D. Qualifications Statement:
 - 1. Qualifications for manufacturer.

1.3 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. Perform Work according to New York State Building Code standards.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials according to manufacturer instructions.
- B. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Membrane-Curing Compound:
 - 1. Comply with ASTM C309, Type 1D, Class B.
 - 2. Manufacturers:
 - a. Anti-Hydro International.
 - b. BASF Corporation-Construction.
 - c. ChemMasters, Inc.
 - d. Dayton Superior Specialty.
 - e. Euclid Chemical Company.
 - f. Kaufman Products, Inc.
 - g. L&M Construction Chemical.

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- h. Lambert Corporation.
- i. Nox-Crete Products Group.
- j. Right Pointe.
- k. SpecChem, LLC.
- l. TK Products.
- m. US Spec.
- n. Vexcon Chemicals Inc.
- o. W.R. Meadows, Inc.
- p. Substitutions: Permitted.

- B. Water: Potable; not detrimental to concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to be cured.

3.2 APPLICATION

- A. Horizontal Surfaces:
 - 1. Comply with ACI 308.1.
 - 2. Spraying: Spray water over floor slab areas and maintain wet for 7 days.
- B. Vertical Surfaces:
 - 1. Comply with ACI 308.1.
 - 2. Membrane-Curing Compound: Apply compound in two coats with second coat applied at right angles to first.

3.3 PROTECTION

- A. Do not permit traffic over unprotected floor surfaces.

END OF SECTION

SECTION 040513 - MASONRY MORTARING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Mortar for masonry.

1.2 SUBMITTALS

- A. Manufacturer's Certificate: Products meet or exceed specified requirements.
- B. Design Data: Submit required environmental conditions, admixture limitations, and design mix if property specification of ASTM C270 is to be used.
- C. Test and Evaluation Reports:
 - 1. Indicate compliance of mortar to property requirements of ASTM C270
- D. Manufacturer Instructions: Premixed mortar installation instructions.

1.3 QUALITY ASSURANCE

- A. Comply with ACI 530/530.1.
- B. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials according to manufacturer instructions.
- B. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.5 AMBIENT CONDITIONS

- A. Cold Weather Requirements: Comply with ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F.
- B. Hot Weather Requirements: Comply with ACI 530/530.1 if ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 - PRODUCTS

2.1 MORTAR

- A. Manufacturers:
 - 1. CTS Cement Manufacturing Corporation.
 - 2. Glen-Gery Corporation.
 - 3. Holcim (US) Inc.

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4. Lafarge North America Inc.
5. Lehigh Hanson; HeidelbergCement Group.
6. QUIKRETE.
7. Solomon Colors Inc.
8. Southern Grouts & Mortars, Inc.

B. Substitutions: Permitted

2.2 MATERIALS

- A. Portland Cement:
1. Comply with ASTM C150, Type I.
 2. Color: To match existing.
- B. Blended Cement:
1. Comply with ASTM C595,
 2. Color: To match existing.
- C. Masonry Cement:
1. Comply with ASTM C91, Type M S N.
 2. Color: To match existing.
- D. Mortar Cement:
1. Comply with ASTM C1329, Type N.
 2. Color: To match existing.
- E. Premix Mortar:
1. Comply with ASTM C387, Type N.
 2. Cement Color: To match existing.
- F. Mortar Aggregate:
1. Comply with ASTM C144.
 2. Type: Standard masonry.
- G. Hydrated Lime: Comply with ASTM C206, Type N.
- H. Quicklime:
1. Comply with ASTM C5.
 2. Type: Non-hydraulic.
- I. Water: Clean and potable.
- J. Mortar Color:
1. Description: Mineral oxide pigment.
 2. Color: to match existing.
- K. Calcium Chloride: Not allowed.

2.3 MIXES

A. Mortar Mixes:

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1. Mortar for Structural Masonry: Comply with ASTM C270, Type S using proportion specification.
2. Mortar for Non-Structural Masonry: Comply with ASTM C270, Type N using proportion specification.
3. Pointing Mortar: Comply with ASTM C270, Type N using proportion specification.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Apply bonding agent to existing surfaces.
- B. Mortar Mixing:
 1. Thoroughly mix mortar ingredients according to ASTM C270 in quantities needed for immediate use.
 2. Achieve uniformly damp sand immediately before mixing process.
 3. Retemper only within two hours of mixing.

3.2 INSTALLATION

- A. According to ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

- A. Establish mortar mix according to ASTM C270.

END OF SECTION

SECTION 040516 - MASONRY GROUTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Grout for masonry.

1.2 SUBMITTALS

- A. Manufacturer's Certificate: Products meet or exceed specified requirements.
- B. Test and Evaluation Reports: Indicate compliance with grout property requirements according to ASTM C476, component grout materials according to ASTM C476, and test and evaluation reports according to ASTM C1019.
- C. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.3 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials according to manufacturer instructions.
- B. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.5 AMBIENT CONDITIONS

- A. Cold Weather Requirements: According to ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F.
- B. Hot Weather Requirements: According to ACI 530/530.1 if ambient temperature is greater than 100 degrees F or if ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 - PRODUCTS

2.1 MASONRY GROUT

- A. Manufacturers:
 - 1. CTS Cement Manufacturing Corporation.
 - 2. Glen-Gery Corporation.
 - 3. Holcim (US) Inc.
 - 4. Lafarge North America Inc.
 - 5. Lehigh Hanson; HeidelbergCement Group.
 - 6. QUIKRETE.
 - 7. Solomon Colors Inc.

SECTION 040516 - MASONRY GROUTING

8. Southern Grouts & Mortars, Inc.

B. Substitutions: Permitted

2.2 MATERIALS

A. Portland Cement: Comply with ASTM C150, Type I.

B. Grout Aggregate: Comply with ASTM C404, fine and coarse.

C. Water: Clean and potable.

D. Calcium Chloride: Not allowed.

2.3 MIXES

A. Grout:

1. Grout for all Masonry:

a. Compressive Strength: 2,000 psi at 28 days.

b. Slump: 8 to 11 inches.

c. Mixing: According to ASTM C476, fine, coarse.

2. Application:

a. Coarse Grout: Grouting spaces with minimum 4 inches dimension in each direction.

b. Fine Grout: Grouting other spaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Request inspection of spaces to be grouted.

3.2 INSTALLATION

A. Mixing:

1. Mix grout according to ASTM C94, as modified to use ingredients complying with ASTM C476.

B. Comply with ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

A. Testing:

1. Mix: Comply with ASTM C1019 for compressive strength, and comply with ASTM C143 for slump.

2. Compressive Strength of Mortar, Grout, and Masonry: Comply with ASTM C1314.

END OF SECTION

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Brick and Concrete masonry units.

1.2 SUBMITTALS

- A. Product Data:
 - 1. Submit data for masonry units fabricated wire reinforcement wall ties anchors cavity insulation and other accessories to be used in construction.
- B. Samples:
 - 1. Submit two full-size samples of brick and concrete block units to illustrate color, texture, and extremes of color range.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures and Related Commentaries.
- B. Perform Work according to New York State Building Code standards.

1.4 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.5 MOCKUPS

- A. Size: Construct brick and concrete block masonry wall mockup, 8 feet long by 6 feet high, including masonry, mortar and accessories
- B. Locate where indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept brick and concrete masonry units on-Site. Inspect for damage.

1.7 AMBIENT CONDITIONS

- A. Do not store reinforcing material directly on ground. Utilize blocking and other methods to prevent rust on accessories prior to installation.
- B. Cold Weather Requirements: According to ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

SECTION 042000 - UNIT MASONRY

- C. Hot Weather Requirements: According to ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.8 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Concrete Masonry Compressive Strength (fm): 1,500 psi; determined by unit strength method.

2.2 MATERIALS

- A. Facing Brick: ASTM C216, Type FBS, Grade SW; color as selected.
- B. Brick Size: Match existing.
- C. Hollow Non-load-bearing CMU: ASTM C129; normal weight.
- D. CMU Size: Match existing.

2.3 ACCESSORIES

- A. Single-Wythe Joint Reinforcement: ASTM A951; truss or ladder type; steel; 0.148-inch-diameter side rods with 0.148-inch-diameter cross ties; hot-dip galvanized
- B. Wall Ties
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc.
 - b. Wire-Bond.
 - 2. Substitutions: Section 016000 - Product Requirements
- C. Wall Ties: ASTM A82; steel wire 3/16-inch diameter, adjustable
- D. Mortar and Grout: As specified in Sections 040513 – Masonry Mortaring and 040516 – Masonry Grouting.
- E. Preformed Control Joints: PVC material. Furnish with corner and T-accessories, heat-fused joints. Profile as indicated.
- F. Joint Filler: Closed cell polyethylene; oversized 50 percent to joint width; self-expanding.

2.4 SOURCE QUALITY CONTROL

- A. Testing: Test brick efflorescence according to ASTM C67. Brick rated greater than "slightly effloresced" is not acceptable.

SECTION 042000 - UNIT MASONRY

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that:
 - 1. Field conditions are acceptable and ready to receive Work.
 - 2. Items provided by other Sections of Work are properly sized and located.
 - 3. Built-in items are in proper location and ready for roughing into masonry Work.

3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other Sections.
- B. Furnish temporary bracing during installation of masonry Work. Maintain in place until building structure provides permanent support.

3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of CMU:
 - 1. Bond: Running
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave
- D. Coursing of Brick Units:
 - 1. Bond: Running Stacked Common.
 - 2. Coursing: Three units and three mortar joints to equal 8 inches.
 - 3. Mortar Joints: Concave Raked Flush Beveled Extruded.
- E. Placing and Bonding:
 - 1. Lay solid masonry units in full bed of mortar, with full head joints.
 - 2. Lay hollow masonry units with face shell bedding on head and bed joints.
 - 3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
 - 4. Remove excess mortar as Work progresses.
 - 5. Interlock intersections and external corners.
 - 6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
 - 7. Perform Site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
 - 8. Isolate masonry from vertical structural framing members with movement joint as indicated.
 - 9. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler.

SECTION 042000 - UNIT MASONRY

- F. Cavity Wall: Do not permit mortar to drop or accumulate into cavity air space or to plug weeps. Build inner wythe ahead of outer wythe to receive cavity insulation and air/vapor retarder adhesive.
- G. Joint Reinforcement and Anchorage - Single-Wythe Masonry:
 - 1. Install horizontal joint reinforcement 16 inches o.c.
- H. Joint Reinforcement and Anchorage - Masonry Veneer:
 - 1. Install horizontal joint reinforcement 16 inches o.c.
- I. Joint Reinforcement and Anchorages - Cavity Wall Masonry:
 - 1. Install horizontal joint reinforcement 16 inches o.c.
- J. Control Joints:
 - 1. Install control joints at the following maximum spacings, unless otherwise indicated on Drawings:
 - a. Exterior Walls: 20 feet o.c. and within 24 inches on one side of each interior and exterior corner.
 - b. Interior Walls: 30 feet o.c.
 - c. At changes in wall height.
 - 2. Do not continue horizontal joint reinforcement through control joints.
 - 3. Form control joint with sheet building paper bond breaker fitted to one side of hollow contour end of block unit. Fill resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- K. Expansion Joints:
 - 1. Form expansion joints as indicated
 - 2. Do not continue horizontal joint reinforcement through expansion joints.
- L. Built-in Work:
 - 1. As Work progresses, install built-in metal door frames and other items to be built in the Work and furnished by other Sections.
 - 2. Install built-in items plumb and level.
 - 3. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
 - 4. Do not build in materials subject to deterioration.
- M. Cutting and Fitting:
 - 1. Obtain Engineer's approval prior to cutting or fitting masonry Work not indicated or where appearance or strength of masonry Work may be impaired.

3.4 TOLERANCES

- A. Maximum Variation from Unit to Adjacent Unit: 1/16 inch.
- B. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
- C. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

SECTION 042000 - UNIT MASONRY

3.5 FIELD QUALITY CONTROL

- A. Brick Units: Test each type according to ASTM C67, 5 random units for each 50,000 units installed.
- B. CMU: Test each type according to ASTM C140.
- C. Prism Tests: Test compressive strength of completed reinforced masonry according to ASTM C1314.

3.6 CLEANING

- A. Clean soiled surfaces with cleaning solution.

3.7 PROTECTION

- A. Protect exposed external corners subject to damage.
- B. Protect base of walls from mud and mortar splatter.
- C. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- D. Protect tops of masonry Work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when Work is not in progress. Maintain protection on tops of completed exterior walls until installation of permanent waterproof cap materials.

END OF SECTION

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Structural shapes.
 - 2. Channels and angles.
 - 3. Hollow structural sections.
 - 4. Structural plates
 - 5. Bolts, connectors, and anchors.
 - 6. Grout.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate profiles sizes spacing locations of structural members openings attachments and bolts.
 - 2. Connections
 - 3. Cambers
 - 4. Indicate welded connections with AWS A2.4 welding symbols, and indicate net weld lengths.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
- D. Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis,
- E. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Qualifications Statements:
 - 1. Submit qualifications for fabricator, erector, shop painter, and welders.

1.3 QUALITY ASSURANCE

- A. Perform Work according to following:
 - 1. Structural Steel: AISC 303
 - 2. Architecturally Exposed Structural Steel: AISC 303, Section 10.
 - 3. High-Strength Bolted Connections: RCSC - Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts.
- B. Perform Work according to New York State Building Code standards.
- C. Fabricator:

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1. Company specializing in fabricating products specified in this Section with minimum three years' documented experience with following current AISC Certification:
 - a. Standard Steel Building Structures (STD).
 - b. Conventional Steel Building Structures (SBD).

- D. Erector:
 1. Company specializing in performing Work of this Section with minimum three years' documented experience with following current AISC Certification:
 - a. Certified Steel Erector (CSE).
 - b. Advanced Certified Steel Erector (ACSE).

- E. Shop Painter:
 1. Company specializing in performing Work of this Section with minimum three years' documented experience with following current AISC Certification:
 - a. Sophisticated Paint Endorsement - Enclosed (P1).
 - b. Sophisticated Paint Endorsement - Covered (P2).
 - c. Sophisticated Paint Endorsement - Outside (P3).

- F. Welders and Welding Procedures: AWS D1.1 qualified within previous 12 months.

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL

- A. Structural W Shapes: ASTM A992
- B. Channels and Angles: ASTM A36
- C. Rectangular, Hollow Structural Sections: ASTM A500, Grade C.
- D. Structural Plates and Bars: ASTM A36

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. Bolts: Heavy-hex, structural type.
 1. ASTM A325; Type 1, galvanized, or Type 3, plain.
 2. ASTM A490; Type 1 or 3, plain.
- B. Nuts: ASTM A563; heavy-hex type.
 1. Finish: Hot-dip galvanized
- C. Washers:
 1. ASTM F436.
 2. Type 1, circular
 3. Finish: Hot-dip galvanized
- D. Shear Connectors:
 1. ASTM A108.
 2. Grade 1015, headed, unfinished, and according to AWS D1.1.
 3. Type B.

SECTION 051200 - STRUCTURAL STEEL FRAMING

- E. Anchor Rods:
 - 1. ASTM F1554; Grade 55, weldable
 - 2. Shape: as indicated on Drawings.
 - 3. Plate Washers: ASTM A36.
- F. Threaded Rods:
 - 1. ASTM A36
 - 2. Finish: Hot-dip galvanized
- G. Forged Structural Steel Hardware:
 - 1. Clevises and Turnbuckles: ASTM A108; Grade 1085.
 - 2. Eye Nuts and Eye Bolts: ASTM A108; Grade 1030.
 - 3. Sleeve Nuts: ASTM A108; Grade 1018.
 - 4. Rod Ends, Yoke Ends and Pins, Cotter Pins, and Coupling Nuts: Carbon steel.

2.3 WELDING MATERIALS

- A. Welding Materials:
 - 1. AWS D1.1.
 - 2. Type required for materials being welded.

2.4 FABRICATION

- A. Space shear stud connectors as indicated on Drawings.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Develop required camber for members.

2.5 FINISHES

- A. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.
- B. Galvanizing for Bolts, Connectors, and Anchors:
 - 1. Hot-Dip Galvanizing:
 - a. Bolts, Nuts, and Washers: ASTM F2329.
 - b. Connectors and Anchors: ASTM A153.
 - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.6 ACCESSORIES

- A. Grout:
 - 1. Non-shrink type; premixed compound consisting of nonmetallic aggregate, cement, water-reducing, and plasticizing additives.
 - 2. Capable of developing minimum compressive strength of 5,000 psi at 28 days.
- B. Shop Primer: SSPC Paint 15, Type 1, red oxide.
- C. Touchup Primer: Match shop primer.

SECTION 051200 - STRUCTURAL STEEL FRAMING

2.7 SOURCE QUALITY CONTROL

- A. Testing: Test bolted and welded connections as specified in PART 3 for field quality control tests.
- B. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 - 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that bearing surfaces are at correct elevation.
- B. Verify that anchor rods are set in correct locations and arrangements, with correct exposure for steel attachment.

3.2 PREPARATION

- A. Furnish templates for installation of anchor rods and embedments in concrete and masonry work.

3.3 ERECTION

- A. Allow for erection loads and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
- B. Field-weld components and shear connectors as indicated on
- C. Field-connect members with threaded fasteners; torque to required resistance and snug-tighten for bearing-type connections.
- D. Do not field-cut or alter structural members without approval of Engineer.
- E. After erection, touch up welds and abrasions to match shop finishes.

3.4 TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, noncumulative.
- B. Maximum Offset from Alignment: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Bolted Connections: Inspect according to AISC 303.
 - 1. Visually inspect all bolted connections.
 - 2. Direct Tension Indicators: Comply with requirements of ASTM F959, and verify that gaps are less than gaps specified in Table 2.

SECTION 051200 - STRUCTURAL STEEL FRAMING

- B. Welding: Inspect welds according to AWS D1.1.
 - 1. Use certified welders, and conduct inspections and tests as required. Record types and locations of defects found in Work. Record work required and performed to correct deficiencies.
 - 2. Visually inspect all welds.
 - 3. Ultrasonic Inspection: ASTM E164; perform on each full-penetration weld.
 - 4. Liquid Penetrant Inspection: ASTM E165.
- C. Correct defective bolted connections and welds.

END OF SECTION

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Overhead coiling doors.
 - 2. Operating hardware.
 - 3. Electric operation.
 - 4. Wiring from electric circuit disconnect to door operator to control station.

1.2 SUBMITTALS

- A. Product Data: General construction details, component connections, wiring diagrams, and electrical equipment details.
- B. Shop Drawings: Relevant dimensioning, anchorage methods, hardware locations, and installation details for applicable supporting wall construction.
- C. Manufacturer's Certificate: Products meet or exceed specified requirements.
- D. Manufacturer Instructions: Installation sequence and procedures, and adjustment and alignment procedures.
- E. Source Quality-Control Submittals: Indicate results of factory tests and inspections.
- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Manufacturer Reports: Indicate that equipment has been installed according to manufacturer instructions.
- H. Qualifications Statements:
 - 1. Qualifications for manufacturer and installer.
 - 2. Manufacturer's approval of installer.

1.3 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by UL or another testing firm acceptable to authority having jurisdiction.
- B. Perform Work according to New York State Building Code standards.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- D. Installer: Company specializing in performing Work of this Section with three years' experience and approved by manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials according to manufacturer instructions.

SECTION 083323 - OVERHEAD COILING DOORS

- B. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.5 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Door Assembly:
 - 1. Wind/Suction Load: 20 psf.
 - 2. Maximum Deflection: 1/120 of span without damage to door or assembly components.
- B. Operation of Door Assembly and Operator: Minimum 20,000 cycles and 10 cycles per day.

2.2 OVERHEAD COILING DOORS

- A. Manufacturers:
 - 1. McKeon Rolling Door Steel Company, Inc.
 - 2. Overhead Door Corporation.
 - 3. Wayne-Daulton Corp.
 - 4. Substitutions: Section 016000 – Product Requirements.
- B. Description:
 - 1. Electric Operation:
 - a. Operator: Electric motor.
 - b. Furnish manual override in case of power failure.
- C. Curtain:
 - 1. Non-fire rated.
 - 2. Slats:
 - a. Type:
 - 1) Interlocking.
 - 2) Sandwich slat construction with manufacturer's standard insulated core.
 - b. Material: Steel, ASTM A653/A653M.
 - c. Minimum Thickness: 24 gage.
 - d. Nominal Size: 2 inches wide by required length.
 - e. Ends: Each slat fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
 - 3. Curtain Bottom: Fitted with angles, channels, or tubes to provide reinforcement and to maintain positive contact with floor in closed position.

SECTION 083323 - OVERHEAD COILING DOORS

4. Guides:
 - a. Material:
 - 1) Galvanized steel, ASTM A653/A653M.
 - 2) Minimum Galvanized Coating Class Designation: G90.
 - b. Minimum Thickness: 3/16 inch.
 - c. Furnish continuous angles of profile required to retain door in place with snap-on trim, with mounting brackets of same metal.
- D. Roller Shaft Counterbalance:
 1. Description:
 - a. Steel pipe capable of supporting curtain load with maximum deflection of 1/120 in./ft. of width.
 - b. Helical steel spring system capable of producing torque sufficient to ensure smooth operation of curtain from any position, and capable of holding position at mid-travel.
 - c. Furnish adjustable spring tension.
- E. Hood Enclosure and Fascia:
 1. Shape: Round.
 2. Material:
 - a. Galvanized steel.
 - b. Minimum Thickness: 24 gage.
 3. Internally reinforced to maintain rigidity and shape.
- F. Hardware:
 1. Locks:
 2. Handle:
 - a. Mounting: Inside side.
 - b. Keeper: Adjustable.
 - c. Latch Bar: Spring activated, with feature to keep in locked or retracted position.
 - d. Handle: Interior.
 3. Weatherstripping of Exterior Assemblies:
 - a. Moistureproof, rot-proof, and resilient.
 - b. Bottom Bar: Replaceable, bulb-style, compressible EDPM gasket extending into guides.
 - c. Guides: Vinyl strip sealing against fascia side of curtain.
 - d. Hood: Neoprene/rayon baffle to impede air flow above coil.
 - e. Lintel Seal: Nylon brush seal fitted at door header to impede air flow.
 4. Smoke Seals for Fire-Rated Assemblies: Perimeter gaskets and closures to prevent spread of smoke through door assembly and to maintain required fire rating and fire label.

2.3 ELECTRIC OPERATOR

- A. Description:
 1. Comply with UL 325.
 2. Mounting: Top.
- B. Electrical Characteristics:
 1. As specified in Section 260503 - Equipment Wiring Connections.

SECTION 083323 - OVERHEAD COILING DOORS

2. Voltage: 120 V, single phase, 60 Hz.
 3. Motors:
 - a. Type: Open, dripproof.
 - b. Enclosure: NEMA MG 1.
 - c. Rating: Industrial duty.
 - d. Controller:
 - 1) NEMA ICS 2, full voltage.
 - 2) Motor Starter: Reversing magnetic.
 - 3) Enclosure: NEMA 250
 4. Brake:
 - a. Type: Adjustable friction clutch.
 - b. Activation: By motor controller.
- C. Control Station:
1. Type: Standard three buttons; OPEN-STOP-CLOSE.
 2. Button Control: Momentary.
 3. Circuit: 24 V.
 4. Mounting: Surface.
- D. Safety Edge:
1. Manufacturer's standard with weatherseal.
 2. Type: Full width; sensitized.
 3. Location: Door bottom.
 4. Wired to stop and reverse upon encountering obstruction.
- E. Photo Eye Sensors:
1. Manufacturer's standard.
 2. Transmitter and Receiver:
 - a. Mounting: Within 12 inches of floor.
 - b. Infrared Beam: Projecting across opening and wired to stop and reverse upon interruption of beam.

2.4 FINISHES

- A. Curtain Slats and Bottom Bar:
1. Steel:
 - a. Finish: Galvanized, G90.
 - b. Color: As selected by owner from standard manufacturer color chart.
- B. Steel Guides and Hood Enclosure: Match finish of door.

2.5 SOURCE QUALITY CONTROL

- A. Provide shop inspection and testing of completed assembly.
- B. Certificate of Compliance:
1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
 2. Specified shop tests are not required for Work performed by approved manufacturer.

SECTION 083323 - OVERHEAD COILING DOORS

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that opening sizes, tolerances, and conditions are acceptable.
- B. Verify that supplementary support framing installed under other Sections is ready to receive doors and operators.

3.2 INSTALLATION

- A. Securement:
 - 1. Securely and rigidly brace components suspended from structure.
 - 2. Secure guides to structural members only.
- B. Install fire-rated door assemblies according to NFPA 80 and requirements for fire listing.
- C. Electric Operators:
 - 1. As specified in Sections 260503 - Equipment Wiring Connections and 260533 - Raceway and Boxes for Electrical Systems.
 - 2. Complete wiring from disconnect to unit components and control stations.
- D. Sealants and Backing Materials: As specified in Section 079000 - Joint Protection.

3.3 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent Work.
- B. Maximum Variation from Plumb: 1/16 inch.
- C. Maximum Variation from Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet straight edge.

3.4 FIELD QUALITY CONTROL

- A. Testing:
 - 1. Test for proper operation.
 - 2. Control System: Start by energizing system equipment and testing operation of hardware and control logic under supervision of manufacturer's representative and in presence of Engineer.
 - 3. Test fire- and smoke-activated assemblies for proper activation.
 - 4. If tests indicate that Work does not meet specified requirements, remove Work, replace, and retest.
- B. Equipment Acceptance: Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.

3.5 ADJUSTING

- A. Adjust door, hardware, and operating assemblies for smooth and noiseless operation.

SECTION 083323 - OVERHEAD COILING DOORS

3.6 CLEANING

- A. Clean door and components.
- B. Remove labels and visible markings.

3.7 DEMONSTRATION

- A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Control panel enclosures.
 - 2. Thermostats.
 - 3. Central air dampers.
 - 4. Electric damper actuators.
- B. Related Requirements:
 - 1. Section 260503 - Equipment Wiring Connections: Execution requirements for electric connections specified by this Section.

1.2 REFERENCE STANDARDS

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality.
- C. American Society of Mechanical Engineers:
 - 1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
- D. American Welding Society:
- E. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.
- F. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA DC 3 - Residential Controls - Electrical Wall-Mounted Room Thermostats.

1.3 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data:
 - 1. Submit description and engineering data for each control system component, including sizing as applicable.
- C. Shop Drawings:
 - 1. Indicate operating data, system drawings, wiring diagrams, and written, detailed operational description of sequences.

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

- D. Manufacturer's Instructions: Submit installation requirements for each control component.
 - E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
 - F. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and installer.
 - 2. Submit manufacturer's approval of installer.
- 1.5 CLOSEOUT SUBMITTALS
- A. Section 017000 - Execution and Closeout Requirements: Requirements for closeout procedures.
- 1.6 MAINTENANCE MATERIAL SUBMITTALS
- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.
- 1.7 QUALITY ASSURANCE
- A. Control Air Damper Performance: According to AMCA 500-D.
 - B. Perform Work according to New York State standard.
- 1.8 QUALIFICATIONS
- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
 - B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
 - B. Inspection: Accept controls on-Site in original factory packaging and inspect for damage.
 - C. Store materials according to manufacturer's instructions.
- 1.10 EXISTING CONDITIONS
- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.
- 1.11 WARRANTY
- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

- B. Furnish one-year manufacturer's warranty for each control-system component HVAC instrumentation.

PART 2 - PRODUCTS

2.1 CONTROL PANEL ENCLOSURES

- A. Furnish enclosure for each system under automatic control.
- B. Equipment Mounting:
 - 1. Within Cabinet: Relays and controls.
 - 2. Flush on Cabinet Panel Face: Temperature indicators, pressure gages, pilot lights, push buttons, and switches.
- C. Construction:
 - 1. Comply with NEMA 250, Type 1.
 - 2. Material: Steel.
- D. Covers:
 - 1. Continuous hinge.
 - 2. Closure: Flush latch operable by key.
- E. Finish: Manufacturer's standard enamel.

2.2 THERMOSTATS

- A. Manufacturer List:
 - 1. Honeywell International, Inc.
 - 2. Johnson Controls, Inc.
 - 3. Schneider Electric USA, Inc.
 - 4. Trane
 - 5. Substitutions: Not permitted.
 - 6. Furnish materials according to building standards.
- B. Electric Room Thermostats:
 - 1. Ductless split system thermostat by same manufacturer as split system.
 - 2. Comply with NEMA DC 3.
 - 3. Voltage: 24 V.
 - 4. Furnish setup temperature control.
 - 5. Service: Cooling.

2.3 CONTROL AIR DAMPERS

- A. Manufacturer List:
 - 1. Greenheck Fan Corporation.
 - 2. Johnson Controls, Inc.
 - 3. Or equal.
 - 4. Furnish materials according to building standards.
- B. Frames:
 - 1. Materials: Galvanized 16 gage steel, welded or riveted channel frame.

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- C. Blades:
 - 1. Material: Galvanized steel.
 - 2. Blade Size:
 - a. Width: 22 inches.
 - b. Length: 22 inches.
 - c. Minimum Thickness: 16 gage.
 - 3. Attach to minimum 1/2-inch diameter plated steel axle.
- D. Seals:
 - 1. Blades:
 - a. Material: TPE.
 - b. Action: Opposed
 - c. Mechanically attached.
 - 2. Jambs: Stainless-steel.
- E. Bearings:
 - 1. Shaft: Synthetic.
 - 2. Linkage: Plated steel out of airstream, concealed in jamb.
- F. Outside Air Damper Leakage: Class 1A at 1 inch wg.
- G. Maximum Pressure Differential: 5-inch wg.
- H. Temperature Limits: Minus 40 to 250 degrees F.

2.4 ELECTRIC DAMPER ACTUATORS

- A. Manufacturer List:
 - 1. Greenheck Fan Corporation
 - 2. Honeywell International, Inc.
 - 3. Siemens Building Technologies, Inc.
 - 4. Or equal.
 - 5. Furnish materials according to building standards.
- B. Actuator:
 - 1. Voltage: 120
 - 2. Spring Close
 - 3. Torque: 180 in-lbs

2.5 OPERATION

- A. Disconnect Switch: Factory mounted on equipment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

- B. Verify that air-handling units and ductwork installation has been completed and that air filters are in place before installing sensors in airstreams.
- C. Verify locations of thermostats and other exposed control sensors with Drawings before installation.

3.2 INSTALLATION

- A. Installation Standards: Install per manufacturer's instructions.

3.3 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- B. After completion of installation, test and adjust control equipment.
- C. Submit data showing set points and final adjustments of controls.
- D. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified, and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.
- E. Furnish Installation Certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

3.4 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate complete operation of systems, including sequence of operation, equipment startup, shutdown.

END OF SECTION

SECTION 233100 - HVAC DUCTS AND CASINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Duct materials.
 - 2. Ductwork fabrication.

1.2 REFERENCE STANDARDS

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE Handbook - Fundamentals.
- B. ASTM International:
 - 1. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. International Code Council:
 - 1. International Energy Conservation Code (IECC).
 - 2. International Mechanical Code (IMC).
- D. NFPA:
 - 1. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems.
- E. Sheet Metal and Air Conditioning Contractors' National Association:
 - 1. SMACNA 016 - HVAC Air Duct Leakage Test Manual.
 - 2. SMACNA 1966 - HVAC Duct Construction Standards - Metal and Flexible.
- F. UL:
 - 1. UL 181A - Closure Systems for Use With Rigid Air Ducts.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information for duct materials and duct connectors.
- C. Shop Drawings:
 - 1. Submit duct fabrication drawings:
 - a. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other Work.
 - b. Fittings.
 - c. Seam and joint construction details.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

SECTION 233100 - HVAC DUCTS AND CASINGS

- E. Qualifications Statements:
 - 1. Submit qualifications for manufacturer, installer, and licensed professional.
 - 2. Submit manufacturer's approval of installer.

- 1.4 CLOSEOUT SUBMITTALS
 - A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

- 1.5 QUALITY ASSURANCE
 - A. Perform Work according to SMACNA 1884 and 1966.
 - B. Construct ductwork to NFPA 90A standards.

- 1.6 QUALIFICATIONS
 - A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
 - B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
 - B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
 - C. Store materials according to manufacturer instructions.
 - D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

- 1.8 AMBIENT CONDITIONS
 - A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
 - B. Minimum Conditions: Do not install duct sealant when temperatures are less than those recommended by sealant manufacturer.
 - C. Subsequent Conditions: Maintain temperatures during and after installation of duct sealant.

- 1.9 EXISTING CONDITIONS
 - A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.

SECTION 233100 - HVAC DUCTS AND CASINGS

2. Indicate field measurements on Shop Drawings.

1.10 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish one-year manufacturer's warranty for ducts.

PART 2 - PRODUCTS

2.1 DUCTS

- A. Performance and Design Criteria:
 1. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission of Engineer.
- B. Materials:
- C. Galvanized-Steel Ducts:
 1. Material: ASTM A653 galvanized-steel sheet.
 2. Quality: Lock forming.
 3. Finish: G60 zinc coating according to ASTM A90.
- D. Fasteners: Rivets, bolts, or sheet metal screws.

2.2 FABRICATION

- A. Rectangular Ducts:
 1. According to SMACNA 1966.
 2. Provide duct material, gages, reinforcing, and sealing for indicated operating pressures.
- B. Divergence:
 1. Increase duct sizes gradually, not exceeding 15 degrees of divergence wherever possible.
 2. Upstream of Equipment: Maximum 30 degrees.
 3. Downstream of Equipment: Maximum 45 degrees.
- C. Sealing:
 1. Seal joints between duct sections and duct seams with welds, gaskets, mastic adhesives, mastic plus embedded fabric systems, or tape.
 2. Sealants, Mastics, and Tapes: Comply with UL 181A and provide products bearing appropriate UL 181A markings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify sizes of equipment connections before fabricating transitions.

SECTION 233100 - HVAC DUCTS AND CASINGS

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

3.3 INSTALLATION

- A. Install and seal ducts according to SMACNA 1966.

3.4 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

3.5 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean duct system and force air at high velocity through duct to remove accumulated dust.
- C. To obtain sufficient airflow, clean one half of system completely before proceeding to other half.

3.6 ATTACHMENTS

- A. Ductwork Material Schedule:
 - 1. Intake and Exhaust: Steel.

END OF SECTION

SECTION 233400 - HVAC FANS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Propeller fans.
- B. Related Sections:
 - 1. Section 233100 - HVAC Ducts and Casings: Product requirements for hangers for placement by this section.
 - 2. Section 260503 - Equipment Wiring Connections: Execution and product requirements for connecting equipment specified by this section.

1.2 REFERENCES

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 99 - Standards Handbook.
 - 2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
 - 3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
 - 4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
 - 5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- B. National Electrical Manufacturers Association:
 - 1. NEMA MG 1 - Motors and Generators.
 - 2. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- C. Underwriters Laboratories Inc.:
 - 1. UL 705 - Power Ventilators.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.
- C. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Submit fan manufacturer instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

SECTION 233400 - HVAC FANS

- B. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.5 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210.
- B. Sound Ratings: AMCA 301, tested to AMCA 300.
- C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- D. Balance Quality: Conform to AMCA 204.
- E. Perform Work in accordance with local authority having jurisdiction standards.
- F. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Protect motors, shafts, and bearings from weather and construction dust.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.9 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish one-year manufacturer's warranty for fans.

1.10 MAINTENANCE SERVICE

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance service.
- B. Furnish service and parts of fans for one year from Date of Substantial Completion.

SECTION 233400 - HVAC FANS

PART 2 - PRODUCTS

2.1 PROPELLER FANS

- A. Manufacturers:
 - 1. Greenheck
 - 2. American Coolair Corporation.
 - 3. Carnes Company.
 - 4. Hartzell Fan Incorporated.
 - 5. Loren Cook Company.
 - 6. Substitutions: Section 016000 - Product Requirements.

- B. Construction:
 - 1. Impeller: Cast aluminum blade with hubs, statically and dynamically balanced, keyed and locked to shaft, directly connected to motor.
 - 2. Frame: Formed galvanized steel frame with bolted construction.

- C. Accessories:
 - 1. Outlet Damper: Multiple blade with offset hinge pin, blades linked, line voltage motor drive, power open, spring return.
 - 2. Safety Screens: Expanded galvanized metal over inlet, motor, and drive; to comply with OSHA regulations.
 - 3. Disconnect switch.
 - 4. Hood: Galvanized 45 degree weatherhood with galvanized bird screen.
 - 5. Fan speed controller.
 - 6. Wall Housing: Galvanized steel construction. Inside flanges for damper mounting. Protective welded, steel wire guard.

- D. Capacity: EF-1 , EF-2
 - 1. Air Flow: 2,000 CMF
 - 2. Static Pressure: 0.64 inches wg
 - 3. RPM: 1750.

- E. Electrical Characteristics and Components: EF-1 , EF-2
 - 1. Electrical Characteristics: In accordance with Section 260503 and the following:
 - a. 1/2 hp
 - b. 120 volts, single phase, 60 Hz.
 - c. 20 amperes maximum circuit breaker size.
 - d. 6.4 minimum circuit ampacity.
 - 2. Motors: In accordance with Section 230513. Type: Open drip proof.
 - 3. Controls: 24 volt thermostat.
 - 4. Disconnect Switch: Factory mount disconnect switch on equipment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Ensure installed exhaust fans will not interfere with overhead crane travel.

SECTION 233400 - HVAC FANS

3.2 PREPARATION

- A. Field verify available space between wall and overhead crane at proposed propeller fan locations.

3.3 INSTALLATION

- A. Secure wall fans with lag screws to structure.
- B. Provide motorized backdraft dampers on outlet to propeller fans and as indicated on Drawings.
- C. Install safety screen where inlet is exposed.
- D. Install backdraft dampers on discharge of exhaust fans and as indicated on Drawings.

3.4 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

3.5 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate fan operation and maintenance procedures.

3.6 SCHEDULES

- A. Propeller Fans:
 - 1. Refer to drawing M-001.

END OF SECTION

SECTION 233700 - AIR OUTLETS AND INLETS

1.1 SUMMARY

- A. Section Includes:
 - 1. Combination Louver/Damper.
- B. Related Sections:
 - 1. Section 230900 - Instrumentation and Control for HVAC: Operators for adjustable louvers.

1.2 REFERENCES

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.
- C. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
- C. Test Reports: Rating of air outlet and inlet performance.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

1.5 QUALITY ASSURANCE

- A. Test and rate louver performance in accordance with AMCA 500.
- B. Perform Work in accordance with Lockport standards.
- C. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.

SECTION 233700 - AIR OUTLETS AND INLETS

1.7 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish one-year manufacturer's warranty for air outlets and inlets.

PART 2 - PRODUCTS

2.1 LOUVERS/DAMPER

- A. Manufacturers:
 - 1. Greenheck Fan Corporation.
 - 2. Ruskin Company.
 - 3. METALAIRE, Inc.
 - 4. Hart & Cooley Inc.
 - 5. Carnes Company.
 - 6. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: Combination drainable louver/damper. Stationary louver, operable damper.
- C. Type: 4 inch deep with blades on 45 degree slope, heavy gauge, extruded aluminum, 0.125 inch frame.
- D. Fabrication: 0.125 thick extruded aluminum, with factory fluoropolymer spray finish color to be selected.
- E. Mounting: Furnish with interior flat flange for installation..
- F. Bird Screen: Bird screen aluminum with 3/4 inch for intake.
- G. Seals: Extruded vinyl blade seals, compressible stainless steel jamb seals.
- H. Linkage: Side linkage concealed in frame.
- I. Axle: 1/2 inch size diameter zinc plated steel.
- J. Water Penetration: Minimum 1,192 fpm velocity.
- K. Louver Operator: Refer to Section 230900.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify inlet size.
- C. Verify wall systems are ready for installation.

SECTION 233700 - AIR OUTLETS AND INLETS

3.2 INSTALLATION

- A. Install louver/damper with airtight connection.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.4 SCHEDULES

- A. Refer to Sheet M-001.

END OF SECTION

SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Air handling unit – Ductless
 - 2. Condensing unit.

1.2 REFERENCES

- A. Air-Conditioning and Refrigeration Institute:
 - 1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
 - 2. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
 - 3. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
 - 4. ARI 365 - Commercial and Industrial Unitary Air-Conditioning Condensing Units.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- C. ASTM International:
 - 1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
- D. National Electrical Manufacturers Association:
 - 1. NEMA MG 1 - Motors and Generators.
- E. NFPA:
 - 1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data indicating:
 - 1. Cooling capacities.
 - 2. Dimensions.
 - 3. Weights.
 - 4. Rough-in connections and connection requirements.
 - 5. Electrical requirements with electrical characteristics and connection requirements.
 - 6. Controls.
 - 7. Accessories.
- C. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

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- E. Manufacturer's Field Reports: Submit start-up report for each unit.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of controls installed remotely from units.
- C. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

1.5 QUALITY ASSURANCE

- A. Performance Requirements: Energy Efficiency Rating (EER) not less than prescribed by ASHRAE 90.1 when used in combination with compressors and evaporator coils.
- B. Sound Rating: Measure in accordance with ARI 270.
- C. Insulation and adhesives: Meet requirements of NFPA 90A.
- D. Perform Work in accordance with local Authority having jurisdiction.
- E. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept units and components on site in factory protective containers, with factory shipping skids and lifting lugs. Inspect for damage.
- C. Comply with manufacturer's installation instruction for rigging, unloading and transporting units.
- D. Protect units from weather and construction traffic by storing in dry, roofed location.

1.8 COORDINATION

- A. Section 013100 – Project Management and Coordination: Requirements for coordination.
- B. Coordinate installation of condensing units with roof structure.

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- C. Coordinate installation of air handling units with building structure.

1.9 WARRANTY

- A. Section 017700 – Closeout Requirements: Requirements for warranties.

1.10 MAINTENANCE SERVICE

- A. Section 017700 – Closeout Requirements: Requirements for maintenance service.
- B. Furnish service and maintenance of equipment for one year from Date of Substantial Completion. Include maintenance items as shown in manufacturer's operating and maintenance data, including filter replacements, fan belt replacement, and controls checkout and adjustments.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Mitsubishi Electric & Electronics USA, Inc.; HVAC Advanced Products Division. (Basis of Design)
 2. Daikin AC
 3. LG
 4. Carrier Corporation; Home Comfort and HVAC Building & Industrial Systems.
 5. YORK; a Johnson Controls company.

2.2 GENERAL

- A. Single zone ductless system comprised of a single frame outdoor unit connected to a single indoor unit with a single refrigerant circuit. Single zone wall mount indoor unit for cooling mode.

2.3 INDOOR UNITS

- A. Refer to sheet M-001 on the plans for the equipment schedule.
- B. Wall mount unit ductless heat pump
- C. Airflow direction control for excellent air distribution
- D. Auto-fan mode.
- E. Built-in condensate drain.
- F. Controlled based on wall mounted, wired remote controller by indoor unit manufacturer.
- G. Individual vane control
- H. Designed to surface mount on wall.

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2.4 OUTDOOR UNIT

- A. Refer to sheet M-001 on the plans for equipment schedule.
- B. The outdoor unit powers the indoor unit, and should a power outage occur, the system is automatically restarted when power returns.
- C. INVERTER-driven twin rotary compressor.
- D. Provide wind baffles for operating down to -40F in cooling mode.
- E. No cold air rush at equipment startup or when restarting after Defrost Cycle.
- F. Blue Fin anti-corrosion treatment applied to the outdoor unit heat exchanger.
- G. Provide lineset, disconnect switch, stainless steel wall bracket.

2.5 REFRIGERANT SYSTEM

- A. The system is designed for use with R410A refrigerant, and consists of a single refrigeration circuit. The refrigeration circuit is pressure-tested at the factory and shipped with a holding charge of helium gas. The outdoor unit is provided with factory installed components, including a refrigerant strainer, accumulator, four-way reversing valve, electronic expansion valve (EEV), high and low side charging ports, service valves, and interconnecting piping.

2.6 COMPRESSORS

- A. The outdoor units are equipped with one hermetically sealed, digitally controlled, inverter-driven twin rotary compressor to modulate capacity (modulation in 1 Hz increments).
- B. Teflon coated bearings, overcurrent protection and vibration isolation are integrated with the compressor.

2.7 TEMPERATURE RANGE

- A. Operating ranges for outdoor units of -40°F to +115°F (DB) for cooling.
- B. Operating ranges for indoor units of 57°F to 77°F (WB) for cooling; 59°F to 81°F (DB) for heating.
- C. Indoor unit temperature setting range of 66°F to 90°F (DB) and 59°F to 73°F (WB) for cooling.

2.8 ACCESSORIES

- A. Low Ambient Wind Baffle Kit
- B. Stainless steel wall bracket.

SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units level and plumb.
- B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- C. Install compressor-condenser components on wall bracket secured to the wall.
- D. Install and connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

- A. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- B. Where piping is exposed on the exterior of the building install in white PVC lineset cover with UV protection.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION

SECTION 260503 - EQUIPMENT WIRING CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes electrical connections to equipment.
- B. Related Sections:
 - 1. Section 260519 - Low-Voltage Electrical Power Conductors and Cables.
 - 2. Section 260533 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA WD 1 - General Requirements for Wiring Devices.
 - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.
- B. National Fire Protection Association:
 - 1. NFPA 70-National Electrical Code

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Submittal procedures.
- B. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

1.5 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
- C. Determine connection locations and requirements.
- D. Sequence rough-in of electrical connections to coordinate with installation of equipment.
- E. Sequence electrical connections to coordinate with start-up of equipment.

SECTION 260503 - EQUIPMENT WIRING CONNECTIONS

PART 2 - PRODUCTS

2.1 CORD AND PLUGS

- A. Attachment Plug Construction: Conform to NEMA WD 1.
- B. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.
- C. Cord Construction: Type SO SJO (as required) multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
- D. Cord Construction: Type SOOW SJOOW (as required) multiconductor flexible cord with identified equipment grounding conductor, suitable for use in wet locations.
- E. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.2 EXISTING WORK

- A. Remove exposed abandoned equipment wiring connections, including abandoned connections above accessible ceiling finishes.
- B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.
- C. Extend existing equipment connections using materials and methods compatible with existing electrical installations, or as specified.

3.3 INSTALLATION

- A. Make electrical connections.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

SECTION 260503 - EQUIPMENT WIRING CONNECTIONS

- E. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- F. Install terminal block jumpers to complete equipment wiring requirements.
- G. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

3.4 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes building wire and cable; service entrance cable; armored cable; metal clad cable; and wiring connectors and connections.
- B. Related Sections:
 - 1. Section 260553 - Identification for Electrical Systems: Product requirements for wire identification.
 - 2. Section 312317 - Trenching: Execution requirements for trenching required by this section.
 - 3. Section 312300 – Excavation and Fill.

1.2 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.
 - 2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- C. Underwriters Laboratories, Inc.:
 - 1. UL 1277 - Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.3 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
 - 1. Stranded conductor for feeders and branch circuits.
 - 2. Stranded conductors for control circuits.
 - 3. Conductor not smaller than 12 AWG for power and lighting circuits.
 - 4. Conductor not smaller than 16 AWG for control circuits.
 - 5. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.
- B. Wiring Methods: Provide the following wiring methods:
 - 1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN-2 insulation, in raceway, armored cable or metal clad cable.
 - 2. Exposed Dry Interior Locations: Use only building wire, Type THHN/THWN-2 insulation, in raceway.
 - 3. Above Accessible Ceilings: Use only building wire, Type THHN/THWN-2 insulation, in raceway, armored cable or metal clad cable.
 - 4. Wet or Damp Interior Locations: Use only building wire, Type THWN-2 insulation, in raceway, armored cable, or metal clad cable.
 - 5. Exterior Locations: Use only building wire, Type THWN-2 insulation, in raceway.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

6. Underground Locations: Use only building wire, Type THWN-2 insulation, in raceway.
7. Cable Tray Locations: Use only Tray cable Type TC armored cable or metal clad cable.
8. Hazardous Classified Locations: Use only building wire, Type THHN/THWN-2 insulation, in rigid steel metallic raceway or metal clad cable (Type MC-HL).

1.4 DESIGN REQUIREMENTS

- A. Conductor sizes are based on copper.

1.5 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit for building wire and each cable assembly type.
- C. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors.
- D. Test Reports: Indicate procedures and values obtained.

1.6 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of components and circuits.

1.7 QUALITY ASSURANCE

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested in accordance with NFPA 262.
- B. Perform Work in accordance with local codes and standards

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.10 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

- C. Wire and cable routing indicated is approximate unless dimensioned.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Product Description: Single conductor insulated wire.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.
- D. Minimum Insulation Temperature Rating: 90 degrees C.
- E. Insulation Material: Thermoplastic.
- F. Listings: wire shall be listed by approved third party testing agency such as UL or CSA.

2.2 ARMORED CABLE

- A. Manufacturers:
 - 1. General Cable
 - 2. Okonite Company
 - 3. Southwire Company
 - 4. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: A fabricated assembly or insulated conductors in a flexible interlocked metallic armor NFPA 70 Type AC.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Minimum Insulation Temperature Rating: 90 degrees C.
- F. Insulation Material: Thermoplastic.
- G. Armor Material: Steel.
- H. Armor Design: Corrugated tube.
- I. Listings: wire shall be listed by approved third party testing agency such as UL or CSA.

2.3 METAL CLAD CABLE

- A. Manufacturers:
 - 1. Okonite Company
 - 2. Southwire Company
 - 3. Substitutions: Section 016000 - Product Requirements.

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- B. Product Description: A factory assembly of one or more insulated circuit conductors with or without optical fiber members enclosed in an armor or corrugated metallic sheath NFPA 70 Type MC.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Minimum Insulation Temperature Rating: 90 degrees C.
- F. Insulation Material: Thermoplastic.
- G. Armor Material: Aluminum.
- H. Armor Design: Corrugated tube.
- I. Jacket: PVC in damp and wet locations.
- J. Listings: wire shall be listed by approved third party testing agency such as UL or CSA.

2.4 TRAY CABLE

- A. Product Description: A factory assembly of two or more insulated conductors, with or without shield, under a nonmetallic jacket NFPA 70 Type TC.
- B. Conductor: Copper.
- C. Overall Jacket: Polyvinyl Chlorine (PVC) in accordance with UL 1277.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation Temperature Rating: 90 degrees C.
- F. Listings: wire shall be listed by approved third party testing agency such as UL or CSA.

2.5 WIRING CONNECTORS

- A. Manufacturers; Split Bolt Connectors:
 - 1. Burndy
 - 2. ILSCO
 - 3. Thomas & Betts Corporation
 - 4. Substitutions: Section 016000 - Product Requirements.
- B. Manufacturers; Solderless Pressure Connectors:
 - 1. 3M
 - 2. Ideal Industries, Inc.
 - 3. Substitutions: Section 016000 - Product Requirements.
- C. Manufacturers; Spring Wire Connectors:
 - 1. 3M
 - 2. NELCO, Inc.
 - 3. Substitutions: Section 016000 - Product Requirements.

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- D. Manufacturers; Compression Connectors:
 - 1. Burndy
 - 2. Ideal Industries, Inc.
 - 3. Leviton Manufacturing Company
 - 4. Thomas & Betts Corporation
 - 5. Substitutions: Section 016000 - Product Requirements.

2.6 TERMINATIONS

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression type copper.
- B. Lugs for Wires 4 AWG and Larger: Color keyed, compression type copper, with insulating sealing collars.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify interior of building has been protected from weather.
- C. Verify mechanical work likely to damage wire and cable has been completed.
- D. Verify raceway installation is complete and supported.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 EXISTING WORK

- A. Remove exposed abandoned wire and cable, including abandoned wire and cable above accessible ceiling finishes. Patch surfaces where removed cables pass through building finishes.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes when wire and cable servicing boxes is abandoned and removed. Install blank cover for abandoned boxes not removed.
- C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing circuits using materials and methods compatible with existing electrical installations, or as specified.
- E. Clean and repair existing wire and cable remaining or wire and cable to be reinstalled.

3.4 INSTALLATION

- A. Route wire and cable to meet Project conditions.

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- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- C. Identify and color code wire and cable under provisions of Section 260553. Identify each conductor with its circuit number or other designation indicated.
- D. Special Techniques--Building Wire in Raceway:
 - 1. Pull conductors into raceway at same time.
 - 2. Install building wire 4 AWG and larger with pulling equipment.
- E. Special Techniques - Cable:
 - 1. Protect exposed cable from damage.
 - 2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure. Do not rest cable on ceiling panels.
 - 3. Use suitable cable fittings and connectors.
- F. Special Techniques - Wiring Connections:
 - 1. Clean conductor surfaces before installing lugs and connectors.
 - 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 - 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
 - 4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
 - 5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 - 6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
 - 7. Terminate aluminum conductors with tin-plated, aluminum-bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.
- G. Install stranded conductors for branch circuits 10 AWG and smaller. Install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.
- H. Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.
- I. Size lugs in accordance with manufacturer's recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.
- J. For terminal lugs fastened together such as on motors, transformers, and other apparatus, or when space between studs is small enough that lugs can turn and touch each other, insulate for dielectric strength of 2-1/2 times normal potential of circuit.

3.5 WIRE COLOR

- A. General:
 - 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Black, red, and blue for circuits at 120/208 volts single or three phase.

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- c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
 2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
- B. Neutral Conductors: White for 120/208 volts. Gray for 277/480V. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors:
 1. For 6 AWG and smaller: Green.
 2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.6 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rod electrodes.
 - 2. Wire.
 - 3. Grounding well components.
 - 4. Mechanical connectors.
 - 5. Exothermic connections.

- B. Related Sections:
 - 1. Section 032000 - Concrete Reinforcing: Bonding or welding bars when reinforcing steel is used for electrodes.
 - 2. Section 096900 - Access Flooring: Grounding systems for access flooring.
 - 3. Section 264100 - Facility Lightning Protection: Grounding of lightning protection system.
 - 4. Section 337900 - Site Grounding: Site related grounding components for buildings and facilities.

1.2 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - 2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.

- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

- C. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.
 - 2. NFPA 99 - Standard for Health Care Facilities.

1.3 SYSTEM DESCRIPTION

- A. Grounding systems use the following elements as grounding electrodes:
 - 1. Existing Metal underground water pipe.
 - 2. Metal building frame.
 - 3. Concrete-encased electrode.
 - 4. Ground ring specified in Section 337900.
 - 5. Rod electrode.
 - 6. Plate electrode.

1.4 DESIGN REQUIREMENTS

- A. Construct and test grounding systems for access flooring systems on conductive floors accordance with IEEE 1100. Refer to Section 096900.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1.5 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 5 ohms maximum.

1.6 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data on grounding electrodes and connections.
- C. Test Reports: Indicate overall resistance to ground and resistance of each electrode, where possible.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.7 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of components and grounding electrodes.

1.8 QUALITY ASSURANCE

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.
- B. Perform Work in accordance with local codes and standards.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing work of this section.

1.10 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- D. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.12 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Complete grounding and bonding of building reinforcing steel prior concrete placement.

PART 2 - PRODUCTS

2.1 ROD ELECTRODES

- A. Product Description:
 - 1. Material: Copper-clad steel.
 - 2. Diameter: 3/4 inch.
 - 3. Length: 10 feet.
- B. Connector: Connector for exothermic welded connection at all buried connections and U-bolt clamp at exposed connections (or in ground wells).

2.2 WIRE

- A. Material: Stranded copper.
- B. Foundation Electrodes: 2 AWG.
- C. Grounding Electrode Conductor: Copper conductor bare.
- D. Bonding Conductor: Copper conductor bare.

2.3 GROUNDING WELL COMPONENTS

- A. Well Pipe: 8 inches NPS by 24 inches long fiberglass pipe with belled end.
- B. Well Cover: Fiberglass with legend "GROUND" embossed on cover.

2.4 MECHANICAL CONNECTORS

- A. Manufacturers:
 - 1. Burndy
 - 2. ERICO International Corporation
 - 3. Harger Lightning and Grounding
 - 4. Substitutions: Section 016000 - Product Requirements.
- B. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.5 EXOTHERMIC CONNECTIONS

- A. Manufacturers:
 - 1. Burndy

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2. ERICO International Corporation
3. Harger Lightning and Grounding
4. Substitutions: Section 016000 - Product Requirements.

- B. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify final backfill and compaction has been completed before driving rod electrodes.

3.2 PREPARATION

- A. Remove paint, rust, mill oils, surface contaminants at connection points.

3.3 EXISTING WORK

- A. Modify existing grounding system to maintain continuity to accommodate renovations.
- B. Extend existing grounding system using materials and methods compatible with existing electrical installations, or as specified.

3.4 INSTALLATION

- A. Install in accordance with IEEE 142 and 1100.
- B. Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes to achieve specified resistance to ground.
- C. Install grounding and bonding conductors concealed from view.
- D. Bond together metal siding not attached to grounded structure; bond to ground.
- E. Bond together reinforcing steel and metal accessories in structures.
- F. Install grounding and bonding in patient care areas to meet requirements of NFPA 99.
- G. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- H. Connect to site grounding system. Refer to Section 337900.
- I. Bond to lightning protection system. Refer to Section 264100.
- J. Install continuous grounding using underground cold water system and building steel as grounding electrode. Where water piping is not available, install artificial station ground by means of driven rods or buried electrodes.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- K. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
- L. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel.
- M. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits by means of grounding bushings on terminations at panelboards with installed number 12 conductor to grounding bus.
- N. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.
- O. Permanently attach equipment and grounding conductors prior to energizing equipment.

3.5 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
- D. Perform ground resistance testing in accordance with IEEE 142.
- E. Perform leakage current tests in accordance with NFPA 99.
- F. Perform continuity testing in accordance with IEEE 142.
- G. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Conduit supports.
 - 2. Formed steel channel.
 - 3. Spring steel clips.
 - 4. Sleeves.
 - 5. Mechanical sleeve seals.
- B. Related Sections:
 - 1. Section 033000 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
 - 4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.
- B. FM Global:
 - 1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.
- C. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.
- D. Underwriters Laboratories Inc.:
 - 1. UL 263 - Fire Tests of Building Construction and Materials.
 - 2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
 - 3. UL 1479 - Fire Tests of Through-Penetration Firestops.
 - 4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
 - 5. UL - Fire Resistance Directory.
- E. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings.

1.3 SYSTEM DESCRIPTION

- A. Firestopping Materials: Comply with requirements of Section 078400.

1.4 PERFORMANCE REQUIREMENTS

- A. Firestopping Materials: Comply with requirements of Section 078400.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1.5 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- C. Product Data:
 - 1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
 - 2. Firestopping: Submit data on product characteristics, performance and limitation criteria.
- D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- E. Design Data: Indicate load carrying capacity of hangers and supports.
- F. Manufacturer's Installation Instructions:
 - 1. Hangers and Supports: Submit special procedures and assembly of components.
 - 2. Firestopping: Submit preparation and installation instructions.
- G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with local codes and standards.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing work of this section.

1.8 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

- A. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
- B. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
- C. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- D. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.
- E. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self locking.

2.2 FORMED STEEL CHANNEL

- A. Product Description: Galvanized 12 gauge thick steel. With holes 1-1/2 inches on center.

2.3 SPRING STEEL CLIPS

- A. Product Description: Mounting hole and screw closure.

2.4 SLEEVES

- A. Furnish materials in accordance with local standards.
- B. Sleeves for conduits Through Non-fire Rated Floors: 18 gauge thick galvanized steel.
- C. Sleeves for conduits Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gauge thick galvanized steel.
- D. Sleeves for conduit Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.
- E. Stuffing Insulation: Glass fiber type, non-combustible.

2.5 MECHANICAL SLEEVE SEALS

- A. Manufacturers:
 - 1. Link-Seal,
 - 2. Heidenreich
 - 3. Substitutions: Section 016000 - Product Requirements.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.6 FIRESTOPPING ACCESSORIES

- A. Installation Accessories: Comply with requirements of Section 078400.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.

3.2 INSTALLATION - HANGERS AND SUPPORTS

- A. Anchors and Fasteners:
 1. Concrete Structural Elements: Provide expansion anchors.
 2. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners.
 3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners.
 5. Solid Masonry Walls: Provide expansion anchors and preset inserts.
 6. Sheet Metal: Provide sheet metal screws.
 7. Wood Elements: Provide wood screws.
- B. Inserts:
 1. Install inserts for placement in concrete forms.
 2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
 4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- C. Install conduit and raceway support and spacing in accordance with NEC.
- D. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- E. Install multiple conduit runs on common hangers.
- F. Supports:
 1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 2. Install surface mounted cabinets and panelboards with minimum of four anchors.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
4. Support vertical conduit at every floor.

3.3 INSTALLATION - FIRESTOPPING

- A. Firestopping Materials: Comply with requirements of Section 078400.

3.4 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 3 inches beyond supported equipment. Refer to Section 033000.
- B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of formed steel channel. Brace and fasten with flanges bolted to structure.

3.5 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with adjustable interlocking rubber links.
- B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.
- C. Set sleeves in position in forms. Provide reinforcing around sleeves.
- D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- E. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

3.6 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.7 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

3.8 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.
- B. Related Sections:
 - 1. Section 260503 - Equipment Wiring Connections.
 - 2. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 3. Section 260529 - Hangers and Supports for Electrical Systems.
 - 4. Section 260553 - Identification for Electrical Systems.
 - 5. Section 262716 - Electrical Cabinets and Enclosures.
 - 6. Section 262726 - Wiring Devices.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 - 2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
 - 3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).
- B. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - 4. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
 - 5. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- C. National Fire Protection Agency
 - 1. NFPA 70-National Electrical Code

1.3 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground More than 5 feet outside Foundation Wall: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
- C. Outdoor Locations, Above Grade: Provide rigid steel or aluminum conduit. Provide cast metal or nonmetallic outlet, pull, and junction boxes.
- D. Wet and Damp Locations: Provide rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- E. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.
- F. Exposed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.4 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 3/4 inch unless otherwise specified.

1.5 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit for the following:
 - 1. Flexible metal conduit.
 - 2. Liquidtight flexible metal conduit.
 - 3. Nonmetallic conduit.
 - 4. Flexible nonmetallic conduit.
 - 5. Raceway fittings.
 - 6. Conduit bodies.
 - 7. Pull and junction boxes.
- C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents:
 - 1. Record actual routing of conduits larger than 2 inch.
 - 2. Record actual routing of all under/in slab conduits.
 - 3. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- C. Protect PVC conduit from sunlight.

1.8 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- B. Coordinate installation of outlet boxes for equipment connected under Section 260503.
- C. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Manufacturers:
 - 1. Allied Tube & Conduit
 - 2. EGS/Appleton Electric
 - 3. Republic Conduit
 - 4. Thomas & Betts Corporation
 - 5. Wheatland Tube Company
 - 6. Substitutions: Section 016000 - Product Requirements.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Rigid Aluminum Conduit: ANSI C80.5.
- D. Intermediate Metal Conduit (IMC): Rigid steel.
- E. Fittings and Conduit Bodies: NEMA FB 1; furnish aluminum fittings with steel conduit.

2.2 FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. AFC Cable Systems, Inc.
 - 2. EGS/Appleton Electric
 - 3. Southwire Company
 - 4. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: Interlocked aluminum construction.
- C. Fittings: NEMA FB 1.

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. AFC Cable Systems, Inc.
 - 2. Anamet Electrical, Inc.
 - 3. Carlon Electrical Products
 - 4. EGS/Appleton Electric
 - 5. Southwire Company
 - 6. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: Interlocked aluminum construction with PVC jacket.
- C. Fittings: NEMA FB 1.

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2.4 ELECTRICAL METALLIC TUBING (EMT)

- A. Manufacturers:
 - 1. Carlon Electrical Product
 - 2. Emerson Process Management
 - 3. Republic Conduit
 - 4. Western Tube and Conduit
 - 5. Wheatland Tube Company
 - 6. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: ANSI C80.3; galvanized tubing.
- C. Fittings and Conduit Bodies: NEMA FB 1; steel, compression or set screw type.

2.5 NONMETALLIC CONDUIT

- A. Manufacturers:
 - 1. Carlon Electrical Product
 - 2. EGS/Appleton Electric
 - 3. Hubbell Premise Wiring
 - 4. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: NEMA TC 2; Schedule 80 PVC.
- C. Fittings and Conduit Bodies: NEMA TC 3.

2.6 OUTLET BOXES

- A. Manufacturers:
 - 1. Carlon Electrical Product
 - 2. RACO
 - 3. Substitutions: Section 016000 - Product Requirements.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.
 - 2. Concrete Ceiling Boxes: Concrete type.
- C. Cast Boxes: NEMA FB 1, Type FD, cast fer alloy. Furnish gasketed cover by box manufacturer.
- D. Wall Plates for Finished Areas: As specified in Section 262726.
- E. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.7 PULL AND JUNCTION BOXES

- A. Manufacturers:
 - 1. Hoffman
 - 2. Kraloy
 - 3. RACO

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

4. Substitutions: Section 016000 - Product Requirements.
- B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- C. Hinged Enclosures: As specified in Section 262716.
- D. Surface Mounted Cast Metal Box: NEMA 250, Type 4X; flat-flanged, surface mounted junction box:
 1. Material: Cast aluminum.
 2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.3 INSTALLATION

- A. Ground and bond raceway and boxes in accordance with Section 260526.
- B. Fasten raceway and box supports to structure and finishes in accordance with Section 260529.
- C. Identify raceway and boxes in accordance with Section 260553.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Arrange raceway supports to prevent misalignment during wiring installation.
- C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 260529; provide space on each for 25 percent additional raceways.
- E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- F. Do not attach raceway to ceiling support wires or other piping systems.
- G. Construct wireway supports from steel channel specified in Section 260529.
- H. Route exposed raceway parallel and perpendicular to walls.
- I. Route conduit under slab from point-to-point.
- J. Maintain clearance between raceway and piping for maintenance purposes.
- K. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- L. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- M. Bring conduit to shoulder of fittings; fasten securely.
- N. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- O. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- P. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.
- Q. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- R. Install fittings to accommodate expansion and deflection where raceway crosses seismic, control and expansion joints.
- S. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- T. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

3.5 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.
- B. Orient boxes to accommodate wiring devices oriented as specified in Section 262726.
- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- D. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- E. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
- F. Do not fasten boxes to ceiling support wires or other piping systems.
- G. Support boxes independently of conduit.
- H. Install gang box where more than one device is mounted together. Do not use sectional box.
- I. Install gang box with plaster ring for single device outlets.

3.6 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with the AHJ.
- B. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.
- C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.7 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Adjust flush-mounting outlets to make front flush with finished wall material.
- C. Install knockout closures in unused openings in boxes.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

3.8 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Clean interior of boxes to remove dust, debris, and other material.
- C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Labels.
 - 3. Wire markers.
 - 4. Conduit markers.
 - 5. Underground Warning Tape.
 - 6. Lockout Devices.

1.2 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data:
 - 1. Submit manufacturer's catalog literature for each product required.
 - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
- C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with local codes and standards.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept identification products on site in original containers. Inspect for damage.
- C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

- D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
- B. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

1.8 EXTRA MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for extra materials.

PART 2 - PRODUCTS

2.1 NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved white letters on black contrasting background color.
- B. Letter Size:
 - 1. 1/8 inch high letters for identifying individual equipment and loads.
 - 2. 1/4 inch high letters for identifying grouped equipment and loads.
- C. Minimum nameplate thickness: 1/8 inch.

2.2 LABELS

- A. Manufacturers:
 - 1. Brady ID
 - 2. Substitutions: Section 016000 - Product Requirements.
- B. Labels: Embossed adhesive tape, with 3/16 inch black letters on white background.

2.3 WIRE MARKERS

- A. Manufacturers:
 - 1. Brady ID
 - 2. Ideal Industries, Inc.
 - 3. Substitutions: Section 016000 - Product Requirements.
- B. Description: Cloth tape, split sleeve, or tubing type wire markers.
- C. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawings.
 - 2. Control Circuits: Control wire number as indicated on Drawings.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

2.4 CONDUIT AND RACEWAY MARKERS

- A. Manufacturers:
 - 1. Brady ID
 - 2. Ideal Industries, Inc.
 - 3. Substitutions: Section 016000 - Product Requirements.
- B. Description: Nameplate fastened with straps or labels fastened with adhesive.
- C. Color:
 - 1. Medium Voltage System: Black lettering on white background.
 - 2. 480 Volt System: Black lettering on white background.
 - 3. 208 Volt System: Black lettering on white background.
- D. Legend:
 - 1. Medium Voltage System: HIGH VOLTAGE.
 - 2. 480 Volt System: 480 VOLTS.
 - 3. 208 Volt System: 208 VOLTS.

2.5 UNDERGROUND WARNING TAPE

- A. Description: 4 inch wide detectable type, colored red with suitable warning legend describing buried electrical lines.

2.6 LOCKOUT DEVICES

- A. Lockout Hasps:
 - 1. Manufacturers:
 - a. Brady ID
 - b. Master Lock Company, LLC
 - c. Substitutions: Section 016000 - Product Requirements.
 - 2. Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 EXISTING WORK

- A. Install identification on existing equipment to remain in accordance with this section.
- B. Install identification on unmarked existing equipment.
- C. Replace lost nameplates, labels, and markers as field required.

3.3 INSTALLATION

- A. Install identifying devices after completion of painting.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

- B. Nameplate Installation:
1. Install nameplate parallel to equipment lines.
 2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
 3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
 4. Secure nameplate to equipment front using adhesive.
 5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
 6. Install nameplates for the following:
 - a. Switchboards.
 - b. Panelboards.
 - c. Transformers.
 - d. Service Disconnects.
 - e. Transfer Switches.
 - f. Motor Control Centers
 - g. Enclosed Motor Starters.
 - h. Control Panels.
- C. Label Installation:
1. Install label parallel to equipment lines.
 2. Install label for identification of individual control device stations.
 3. Install labels for permanent adhesion and seal with clear lacquer.
- D. Wire Marker Installation:
1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
 2. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
 3. Install labels at data outlets identifying patch panel and port designation.
- E. Underground Warning Tape Installation:
1. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

END OF SECTION

SECTION 262200 - LOW-VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Two-winding transformers.
- B. Related Requirements:
 - 1. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 2. Section 260529 - Hangers and Supports for Electrical Systems.
 - 3. Section 260533 - Raceway and Boxes for Electrical Systems.
 - 4. Section 260553 - Identification for Electrical Systems.

1.2 REFERENCE STANDARDS

- A. National Electrical Manufacturers Association:
 - 1. NEMA ST 1 - Specialty Transformers (Except General Purpose Type).
 - 2. NEMA ST 20 - Dry Type Transformers for General Applications.
- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.
- C. Test and Evaluation Reports: Indicate loss data, efficiency at 25, 50, 75 and 100 percent rated load, and sound level.
- D. Source Quality Control Submittals: Indicate results of factory tests and inspections.
- E. Field Quality Control Submittals: Indicate results of Contractor furnished tests and inspections.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Record Documentation: Record actual locations of transformers.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

SECTION 262200 - LOW-VOLTAGE TRANSFORMERS

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

PART 2 - PRODUCTS

2.1 TWO-WINDING TRANSFORMERS

- A. Manufacturers:
 - 1. Eaton Corporation
 - 2. General Electric Company
 - 3. Schneider Electric USA
 - 4. Siemens
 - 5. Substitutions: Section 016000 - Product Requirements.
- B. Description: NEMA ST 20, factory-assembled, air-cooled, dry type transformers , ratings as indicated on Drawings.
- C. Operation:
 - 1. Primary Voltage: 480 volts, 3 phase.
 - 2. Secondary Voltage: 208Y/120 volts, 3 phase.
 - 3. Insulation system and average winding temperature rise for rated kVA as follows:
 - 4. 1-15 kVA: Class 180 with 115 degrees C rise.
 - 5. 16-500 kVA: Class 220 with 150 degrees C rise.
 - 6. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.
 - 7. Winding Taps:
 - a. Transformers Less than 15 kVA: Two 2.5 percent below rated voltage, full capacity taps on primary winding.
 - b. Transformers 15 kVA and Larger: for 2.5% below and two 2.5% above.
 - 8. Sound Levels: NEMA ST 20.
 - 9. Basic Impulse Level: 10 kV.
 - 10. Mounting:
 - a. 1-15 kVA: Suitable for wall mounting.
 - b. 16-75 kVA: Suitable for wall, floor, or trapeze mounting.
 - c. Larger than 75 kVA: Suitable for floor mounting.
- D. Materials:
 - 1. Ground core and coil assembly to enclosure by means of visible flexible copper grounding strap.
 - 2. Coil Conductors: Continuous copper windings with terminations brazed or welded.
 - 3. Enclosure: NEMA ST 20, Type 1 ventilated. Furnish lifting eyes or brackets.

SECTION 262200 - LOW-VOLTAGE TRANSFORMERS

- E. Fabrication:
 - 1. Isolate core and coil from enclosure using vibration-absorbing mounts.
 - 2. Nameplate: Include transformer connection data.

2.2 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Production test each unit according to NEMA ST20.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify mounting supports are properly sized and located including concealed bracing in walls.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Provide concrete pads under provisions of Section 033000.

3.3 DEMOLITION

- A. Disconnect and remove abandoned transformers.
- B. Maintain access and adequate ventilation to existing transformers and other installations remaining active and requiring access and ventilation. Modify installation or provide access panel or ventilation grilles.

3.4 INSTALLATION

- A. Set transformer plumb and level.
- B. Use flexible conduit, in accordance with Section 260533, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
- C. Support transformers in accordance with Section 260529.
 - 1. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by manufacturer.
 - 2. Mount floor-mounted transformers on vibration isolating pads suitable for isolating transformer noise from building structure.
 - 3. Mount trapeze-mounted transformers as indicated on Drawings and/or recommended by the manufacturer.
- D. Provide seismic restraints.

SECTION 262200 - LOW-VOLTAGE TRANSFORMERS

- E. Install grounding and bonding in accordance with Section 260526.

3.5 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements - Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspect and test in accordance with NETA ATS, except Section 4.
- D. Perform inspections and tests listed in NETA ATS, Section 7.2.1.

3.6 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Measure primary and secondary voltages and make appropriate tap adjustments.

3.7 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean existing transformers to remain or to be reinstalled.

END OF SECTION

SECTION 262413 - SWITCHBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Main switchboards.

1.2 SUBMITTALS

- A. Section 013300 – Submittal Procedures.
- B. Shop Drawings: Indicate front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars for each phase, neutral, and ground; and switchboard instrument details.
- C. Product Data: Electrical characteristics including voltage, frame size and trip ratings, fault current withstand ratings, and time-current curves of equipment and components.
- D. Test Reports: Indicate results of factory production and field tests.

1.3 CLOSEOUT SUBMITTALS

- A. Section 017000 – Execution and Closeout Requirements: Closeout Procedures.
- B. Project Record Documents: Record actual locations, configurations, and ratings of switchboards and their components on single line diagrams and plan layouts.
- C. Operation and Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in 48 inch maximum width shipping splits, individually wrapped for protection and mounted on shipping skids.
- B. Accept switchboards on Site. Inspect for damage.
- C. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.
- D. Handle according to NEMA PB 2.1. Lift only with lugs provided. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Conform to NEMA PB 2 service conditions during and after installation of switchboards.

SECTION 262413 - SWITCHBOARDS

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication, and indicate on Shop Drawings.

1.8 SEQUENCING

- A. Sequence Work to avoid interferences with building finishes and installation of other products.

1.9 MAINTENANCE MATERIALS

- A. Furnish two of each key.
- B. Furnish one fuse puller.

1.10 EXTRA MATERIALS

- A. Furnish three of each size and type of fuse installed.

PART 2 - PRODUCTS

2.1 DISTRIBUTION SWITCHBOARDS

- A. Manufacturers:
 - 1. ABB, Electrification Business.
 - 2. Eaton.
 - 3. Schneider Electric USA, Inc.
 - 4. Siemens Industry, Inc., Energy Management Division.
 - 5. Substitutions: Section 016000 – Product Requirements.
- B. Product Description: NEMA PB 2, enclosed switchboard with electrical ratings and configurations as indicated.
- C. Service Conditions:
 - 1. Meet requirements for use as service disconnecting means.
- D. Device Mounting:
 - 1. Main Section: Individually mounted
 - 2. Auxiliary Section: Individually mounted and compartmentalized.
- E. Bus:
 - 1. Material: Copper with tin plating, standard size.
 - 2. Connections: Bolted, accessible from front for maintenance.
 - 3. Insulation: Fully insulate load side bus bars.
- F. Ground Bus: extend length of switchboard.
- G. Minimum Short Circuit Rating: 65,000 symmetrical amperes rms, fully rated,.
- H. Line and Load Terminations: Accessible from front only of switchboard, suitable for conductor materials and sizes as indicated.

SECTION 262413 - SWITCHBOARDS

- I. Pull Section: 18 inch width, depth and height to match switchboard. Arrange as indicated.
- J. Enclosure: Type 1 - General Purpose.
- K. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.

2.2 FUSIBLE SWITCH ASSEMBLIES LARGER THAN 1,600 AMPERES

- A. Manufacturers:
 - 1. Cutler-Hammer.
 - 2. Eaton.
 - 3. Siemens Industry, Inc., Energy Management Division.
 - 4. Square D; Schneider Electric USA.
 - 5. Substitutions: Section 016000 – Product Requirements.
- B. Product Description: NEMA KS 1, bolted pressure contact switch.
- C. Fuse Provisions: Designed to accommodate NEMA FU 1, Class J fuses.

2.3 TRANSIENT VOLTAGE SUPPRESSION DEVICES

- A. Manufacturers:
 - 1. ABB, Electrification Business.
 - 2. ALLTEC.
 - 3. Bussmann; Eaton, Electrical Sector.
 - 4. ERICO; nVent.
 - 5. Siemens Industry, Inc., Energy Management Division.
 - 6. Substitutions: Section 016000 – Product Requirements.
- B. Product Description: IEEE C62.41, factory-mounted transient voltage surge suppressor, selected to meet requirements for medium exposure and to coordinate with system circuit voltage.

2.4 POWER METERS

- A. Manufacturers:
 - 1. IQ 250.
 - 2. Eaton.
 - 3. Substitutions: Section 016000 – Product Requirements.
- B. Meters: ANSI C12.2; three phase type with current and potential coil, rated 5 amperes and 120 volts at 60 Hz. Meter suitable for connection to three- and four-wire circuits.
- C. Meter to read display and store valves as indicated in table below:

SECTION 262413 - SWITCHBOARDS

Measured Values	Instantaneous	Avg.	Max	Min.
Voltage L-N	X		X	X
Voltage L-L	X		X	X
Current per Phase	X	X	X	X
Current Neutral	X	X	X	X
WATT (A, B, C, Tot.)	X	X	X	X
VAR (A, B, C, Tot.)	X	X	X	X
VA (A, B, C, Tot.)	X	X	X	X
PF (A, B, C, Tot.)	X	X	X	X
+ Watt-Hour (A, B, C, Tot.)	X			
- Watt-Hour (A, B, C, Tot.)	X			
Watt-Hour (A, B, C, Tot.)	X			
+ VAR-Hour (A, B, C, Tot.)	X			
- VAR-Hour (A, B, C, Tot.)	X			
VAR-Hour Net (A, B, C, Tot.)	X			
VA-Hour (A, B, C, Tot.)	X			
Frequency	X		X	X
% THD (IQ 260)	X		X	X
Voltage Angles	X			
Current Angles	X			
% of Load Bar	X			

2.5 SOURCE QUALITY CONTROL

- A. Furnish shop inspection and testing according to NEMA PB 2.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify surface is suitable for switchboard installation.

3.2 EXISTING WORK

- A. Disconnect and remove abandoned switchboards.

3.3 INSTALLATION

- A. Install according to NEMA PB 2.1.
- B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.
- C. Install fuses in each switch and coordinate sizes with connected load.
- D. Install engraved plastic nameplates according to Section 260553.
- E. Install breaker circuit directory.
- F. Ground and bond switchboards according to Section 260526.

SECTION 262413 - SWITCHBOARDS

3.4 FIELD QUALITY CONTROL

- A. Inspect and test according to NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.1.

3.5 ADJUSTING

- A. Adjust operating mechanisms for free mechanical movement.
- B. Tighten bolted bus connections.

3.6 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Distribution and branch circuit panelboards.
- B. Related Requirements:
 - 1. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 2. Section 260553 - Identification for Electrical Systems.

1.2 REFERENCE STANDARDS

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- B. National Electrical Manufacturers Association:
 - 1. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
 - 3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
 - 4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
 - 5. NEMA PB 1 - Panelboards.
 - 6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.
- E. Underwriters Laboratories Inc.:
 - 1. UL 50 - Cabinets and Boxes
 - 2. UL 67 - Safety for Panelboards.
 - 3. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
 - 4. UL 1449 - Transient Voltage Surge Suppressors.
 - 5. UL 1699 - Arc-Fault Circuit Interrupters.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit catalog data showing specified features of standard products.

SECTION 262416 - PANELBOARDS

- C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.
- C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance products.
- B. Extra Stock Materials:
 - 1. Furnish two of each panelboard key. Panelboards keyed alike.

1.6 QUALITY ASSURANCE

- A. Qualifications
 - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 - PRODUCTS

2.1 DISTRIBUTION PANELBOARDS

- A. Manufacturers:
 - 1. Eaton Electrical Sector (Cutler-Hammer)
 - 2. General Electric Company
 - 3. Siemens Industry, Inc.
 - 4. Square D
 - 5. Substitutions: Section 016000 - Product Requirements.
- B. Description: NEMA PB 1, circuit breaker type panelboard.
- C. Materials
 - 1. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.
 - 2. Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
 - 3. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated on Drawings.
 - 4. Enclosure: NEMA PB 1, Type 1, 6 inches deep, 20 inches wide, cabinet box.

SECTION 262416 - PANELBOARDS

5. Cabinet Front: Surface type, fastened with concealed trim clamps or screws, hinged door with flush lock.

- D. Finishes
1. Manufacturer's standard gray enamel.

2.2 BRANCH CIRCUIT PANELBOARDS

- A. Manufacturers:
1. Eaton Electrical Sector
 2. General Electric Company
 3. Siemens Industry, Inc.
 4. Square D
 5. Substitutions: Section 016000 - Product Requirements.
- B. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.
- C. Materials:
1. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.
 2. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 240 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, or as indicated on Drawings.
 3. Molded Case Circuit Breakers: UL 489, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Provide UL class 760 arc-fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.
 4. Enclosure: NEMA PB 1, Type 1.
 5. Cabinet Box: 6 inches deep, 20 inches wide.
- D. Cabinet Front: Surface cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finishes:
1. Finish in manufacturer's standard gray enamel.

2.3 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Independently test integral surge suppressers with category C3 high exposure waveform (20 kV-1.2/50us, 10kA-8/20 us) per IEEE C62.41.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Disconnect abandoned panelboards. Install blank cover for abandoned panelboards.

SECTION 262416 - PANELBOARDS

- B. Maintain access to existing panelboard remaining active and requiring access. Modify installation or provide access panel.

3.2 INSTALLATION

- A. Install panelboards in accordance with NEMA PB 1.1.
- B. Install panelboards plumb.
- C. Install recessed panelboards flush with wall finishes.
- D. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.
- E. Install filler plates for unused spaces in panelboards.
- F. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads. Identify each circuit as to its clear, evident and specific purpose of use.
- G. Install engraved plastic nameplates in accordance with Section 260553.
- H. Ground and bond panelboard enclosure according to Section 260526. Connect equipment ground bars of panels in accordance with NFPA 70.

3.3 REPAIR

- A. Repair existing panelboards to remain or to be reinstalled.

3.4 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting, testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspect and test in accordance with NETA ATS, except Section 4.
- D. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.
- E. Perform switch inspections and tests listed in NETA ATS, Section 7.5.
- F. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.5 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.
- B. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

SECTION 262416 - PANELBOARDS

3.6 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean existing panelboards to remain or to be reinstalled.

END OF SECTION

SECTION 262716 - ELECTRICAL CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hinged cover enclosures.
 - 2. Cabinets.
 - 3. Terminal blocks.
 - 4. Accessories.
- B. Related Requirements:
 - 1. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 2. Section 260529 - Hangers and Supports for Electrical Systems.
 - 3. Section 260533 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCE STANDARDS

- A. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA ICS 4 - Industrial Control and Systems: Terminal Blocks.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's standard data for enclosures, cabinets, and terminal blocks.
- C. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- D. Qualification Statements:
 - 1. Submit fabricator, experience qualifications.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.
- B. Extra Stock Materials:
 - 1. Furnish two of each key.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

SECTION 262716 - ELECTRICAL CABINETS AND ENCLOSURES

PART 2 - PRODUCTS

2.1 HINGED COVER ENCLOSURES

- A. Manufacturers:
1. Rittal
 2. Adalet
 3. Hoffman
 4. Substitutions: Section 016000 - Product Requirements.
- B. Description: NEMA 250, Type 1 steel stainless steel enclosure.
1. Covers: Continuous hinge, held closed by flush latch operable by screwdriver and key.
 2. Furnish interior metal panel for mounting terminal blocks and electrical components; finish with white enamel.
 3. Enclosure Finish: Manufacturer's standard enamel.

2.2 CABINETS

- A. Manufacturers:
1. Rittal
 2. Hammon Mfg. Co., Inc
 3. Hoffman
 4. Substitutions: Section 016000 - Product Requirements.
- B. Description:
1. Boxes: Galvanized steel.
 2. Box Size: as indicated on Drawings.
 3. Backboard: Furnish backboard for mounting terminal blocks. Paint matte white.
 4. Fronts: Steel, surface type with concealed trim clamps, door with concealed hinge, and flush lock.
- C. Fabrication
1. Furnish metal barriers to form separate compartments wiring of different systems and voltages.
 2. Furnish accessory feet for free-standing equipment.
- D. Finishes:
1. Finish with gray baked enamel.

2.3 TERMINAL BLOCKS

- A. Manufacturers:
1. Pheonix Contact
 2. Allen-Bradley/Rockwell
 3. Cooper Bussmann
 4. Square D
 5. Substitutions: Section 016000 - Product Requirements.
- B. Description:
1. Terminal Blocks: NEMA ICS 4.

SECTION 262716 - ELECTRICAL CABINETS AND ENCLOSURES

2. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.
3. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.
4. Furnish ground bus terminal block, with each connector bonded to enclosure.

2.4 PLASTIC RACEWAY

- A. Manufacturers:
 1. Panduit Corp.
 2. Wiremold/Legrand
 3. Substitutions: Section 016000 - Product Requirements.
- B. Description: Plastic channel with hinged or snap-on cover.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Remove abandoned cabinets and enclosures, including abandoned cabinets and enclosures above accessible ceiling finishes. Patch surfaces.
- B. Maintain access to existing cabinets and enclosures and other installations remaining active and requiring access. Modify installation or provide access panel.
- C. Extend existing cabinets and enclosures using materials and methods compatible with existing electrical installations, or as specified.

3.2 REPAIR

- A. Repair existing cabinets and enclosures to remain or to be reinstalled.

3.3 INSTALLATION

- A. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner in accordance with Section 260529.
- B. Install cabinet fronts plumb.

3.4 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Clean existing cabinets and enclosures to remain or to be reinstalled.
- C. Clean electrical parts to remove conductive and harmful materials.
- D. Remove dirt and debris from enclosure.
- E. Clean finishes and touch up damage.

END OF SECTION

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes wall switches; wall dimmers; receptacles; multioutlet assembly; and device plates and decorative box covers.
- B. Related Sections:
 - 1. Section 260533 - Raceway and Boxes for Electrical Systems: Outlet boxes for wiring devices.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA WD 1 - General Requirements for Wiring Devices.
 - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.5 EXTRA MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish two of each style, size, and finish wall plate.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

- A. Manufacturers; Wall Switches:
 - 1. Cooper Wiring Devices, Inc.
 - 2. Leviton Manufacturing Co.
 - 3. Pass Seymour/Legrand
 - 4. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: NEMA WD 1, Heavy-Duty, AC only general-use snap switch.
- C. Body and Handle: Ivory plastic with toggle or rocker handle.

SECTION 262726 - WIRING DEVICES

- D. Ratings:
 - 1. Voltage: 120-277 volts, AC.
 - 2. Current: 20 amperes.

2.2 RECEPTACLES

- A. Manufacturers:
 - 1. Cooper Wiring Devices, Inc.
 - 2. Leviton Manufacturing Co.
 - 3. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: NEMA WD 1, Heavy-duty general use receptacle.
- C. Device Body: Ivory plastic.
- D. Configuration: NEMA WD 6, type as indicated on Drawings.
- E. Convenience Receptacle: Type 5-20.
- F. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.3 WALL PLATES

- A. Manufacturers:
 - 1. Cooper
 - 2. EGS/Appleton Electric
 - 3. Leviton Manufacturing Co.
 - 4. Lutron Electronics Co., Inc.
 - 5. RACO; Hubbell
 - 6. Substitutions: Section 016000 - Product Requirements.
- B. Cover Plate: 302 stainless steel.
- C. Weatherproof Cover Plate: Gasketed cast metal plate with hinged, gasketed and in use device cover.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify outlet boxes are installed at proper height.
- C. Verify wall openings are neatly cut and completely covered by wall plates.
- D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

SECTION 262726 - WIRING DEVICES

3.2 PREPARATION

- A. Clean debris from outlet boxes.

3.3 EXISTING WORK

- A. Disconnect and remove abandoned wiring devices.
- B. Modify installation to maintain access to existing wiring devices to remain active.
- C. Clean and repair existing wiring devices to remain or to be reinstalled.

3.4 INSTALLATION

- A. Install devices plumb and level.
- B. Install switches with OFF position down.
- C. Install receptacles with grounding pole on top.
- D. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.
- E. Install wall plates on switches, receptacles, and blank outlets.
- F. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 260533 to obtain mounting heights as indicated on drawings.
- B. Install wall switch 48 inches above finished floor.
- C. Install convenience receptacle 18 inches above finished floor.
- D. Install convenience receptacle 6 inches above counter.

3.6 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect each wiring device for defects.
- C. Operate each wall switch with circuit energized and verify proper operation.
- D. Verify each receptacle device is energized.
- E. Test each receptacle device for proper polarity.

SECTION 262726 - WIRING DEVICES

- F. Test each GFCI receptacle device for proper operation.

3.7 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Adjust devices and wall plates to be flush and level.

3.8 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 262813 - FUSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fuses.

1.2 REFERENCE STANDARDS

- A. National Electrical Manufacturers Association:
 - 1. NEMA FU 1 - Low Voltage Cartridge Fuses.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data sheets showing electrical characteristics, including time-current curves.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual sizes, ratings, and locations of fuses.

1.5 MAINTENANCE MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials
- B. Spare Parts:
 - 1. Furnish two fuse pullers.
- C. Extra Materials:
 - 1. Furnish three spare fuses of each Class, size, and rating installed.

1.6 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:
 - 1. Bussmann; Eaton, Electrical Sector.
 - 2. Substitutions: Section 016000 - Product Requirements.

SECTION 262813 - FUSES

2.2 FUES PERFORMANCE REQUIREMENTS

- A. Main Service Switches Larger than 600 amperes: Class L (time delay).
- B. Main Service Switches: Class J (time delay).
- C. Power Load Feeder Switches Larger than 600 amperes: Class L (time delay).
- D. Power Load Feeder Switches: Class J (time delay).
- E. Motor Load Feeder Switches: Class J (time delay).
- F. Motor Branch Circuits: Class J (time delay).

2.3 FUSES

- A. Dimensions and Performance: NEMA FU 1, Class as specified or as indicated on Drawings.
- B. Voltage: Rating suitable for circuit phase-to-phase voltage.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Remove fuses from abandoned circuits.
- B. Maintain access to existing fuses and other installations remaining active and requiring access. Modify installation or provide access panel.

3.2 INSTALLATION

- A. Install fuse with label oriented so manufacturer, type, and size are easily read.

END OF SECTION

SECTION 262819 - ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fusible.
 - 2. Nonfusible switches.
- B. Related Requirements:
 - 1. Section 260529 - Hangers and Supports for Electrical Systems.
 - 2. Section 260553 - Identification for Electrical Systems.
 - 3. Section 262813 - Fuses.
 - 4. Section 337173 – Electrical Utility Service.

1.2 REFERENCE STANDARDS

- A. National Electrical Manufacturers Association:
 - 1. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit switch ratings and enclosure dimensions.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCH ASSEMBLIES

- A. Manufacturers:
 - 1. General Electric Company
 - 2. Cutler-Hammer
 - 3. Siemens Power Transmission

SECTION 262819 - ENCLOSED SWITCHES

4. Square D
 5. Substitutions: Section 016000 - Product Requirements.
- B. Description: NEMA KS 1, Type HD GD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position.
- C. Operation:
1. Switch Ratings
 - a. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
 - b. Short Circuit Current Rating: UL listed for 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses (30-600 ampere switches employing appropriate fuse rejection schemes). 200,000 rms symmetrical amperes when used with or protected by Class L fuses (800-1200 ampere).
- D. Materials:
1. Fuse clips: Designed to accommodate NEMA FU 1, Class J fuses.
 2. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - a. Interior Dry Locations: Type 1.
 - b. Exterior Locations: Type 3R.
 - c. Industrial Locations: Type 4, 4X, 12.
 - d. Hazardous Locations: Type 7.

2.2 NONFUSIBLE SWITCH ASSEMBLIES

- A. Manufacturers:
1. General Electric Company
 2. Eaton Electrical Sector
 3. Siemens Power Transmission
 4. Square D
 5. Substitutions: Section 016000 - Product Requirements.
- B. Description: NEMA KS 1, Type HD ,GD with externally operable handle interlocked to prevent opening front cover with switch in ON position enclosed load interrupter knife switch. Handle lockable in OFF position.
- C. Operation:
1. Switch Ratings
 - a. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
 - b. Short Circuit Current Rating: UL listed for 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses (30-600 ampere switches employing appropriate fuse rejection schemes). 200,000 rms symmetrical amperes when used with or protected by Class L fuses (800-1200 ampere).

SECTION 262819 - ENCLOSED SWITCHES

- D. Materials:
 - 1. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - a. Interior Dry Locations: Type 1.
 - b. Exterior Locations: Type 3R.
 - c. Industrial Locations: Type 4, 4X, 12.
 - d. Hazardous Locations: Type 7.
 - 2. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Disconnect and remove abandoned enclosed switches.
- B. Maintain access to existing enclosed switches and other installations remaining active and requiring access. Modify installation or provide access panel.

3.2 INSTALLATION

- A. Install enclosed switches where indicated.
- B. Install enclosed switches plumb. Provide supports in accordance with Section 260529.
- C. Height: 5 feet to operating handle.
- D. Install fuses for fusible disconnect switches. Refer to Section 262813 for product requirements.
- E. Install engraved plastic nameplates in accordance with Section 260553. Engrave nameplates with the equipment served and the panel and circuit number supplying the switch.
- F. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.3 REPAIR

- A. Repair existing enclosed switches to remain or to be reinstalled....

3.4 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements - Requirements for inspecting, testing, adjusting, and balancing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspect and test in accordance with NETA ATS, except Section 4.

SECTION 262819 - ENCLOSED SWITCHES

- D. Perform inspections and tests listed in NETA ATS, Section 7.5.

3.5 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean existing enclosed switches to remain or to be reinstalled.

END OF SECTION

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes variable frequency controllers.
- B. Related Sections:
 - 1. Section 262813 - Fuses.

1.2 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- B. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 3. NEMA ICS 7 - Industrial Control and Systems: Adjustable Speed Drives.
 - 4. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable Speed Drive Systems.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; and nameplate legends.
- C. Product Data: Submit catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.
- D. Test Reports: Indicate field test and inspection procedures and test results.
- E. Manufacturer's Field Reports: Indicate start-up inspection findings.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit instructions complying with NEMA ICS 7.1. Include procedures for starting and operating controllers, and describe operating limits possibly resulting in hazardous or unsafe conditions. Include routine preventive maintenance schedule.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience, and with service facilities within 100 miles of project.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided. Handle carefully to avoid damage to components, enclosure, and finish.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements.
- B. Conform to NEMA ICS 7 service conditions during and after installation of variable frequency controllers.

1.8 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish two year manufacturer warranty for variable frequency controller.

1.9 MAINTENANCE SERVICE

- A. Section 017000 - Execution and Closeout Requirements: Maintenance service.
- B. Furnish service and maintenance of variable frequency controller for one year from Date of Substantial Completion.

1.10 MAINTENANCE MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish two of each air filter.

PART 2 - PRODUCTS

2.1 VARIABLE FREQUENCY CONTROLLER

- A. Manufacturers:
 - 1. ABB
 - 2. Allen-Bradley/Rockwell
 - 3. Cutler Hammer (Eaton)

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

4. Square D
 5. Yaskawa
 6. Substitutions: Section 016000 - Product Requirements.
- B. Product Description: NEMA ICS 7, enclosed variable frequency controller suitable for operating indicated loads. Select unspecified features and options in accordance with NEMA ICS 7.1.
- C. Ratings:
1. Rated Input Voltage: 480 volts, three phase, 60 Hertz.
 2. Motor Nameplate Voltage: 460 volts, three phase, 60 Hertz.
 3. Displacement Power Factor: Between 1.0 and 0.95, lagging, over entire range of operating speed and load.
 4. Operating Ambient: 0 degrees C to 40 degrees C.
- D. Design Features:
1. Employ microprocessor-based inverter logic isolated from power circuits.
 2. Employ pulse-width-modulated inverter system.
 3. Design for ability to operate controller with motor disconnected from output.
 4. Design to attempt five automatic restarts following fault condition before locking out and requiring manual restart.
- E. Indicators and Manual Controls:
1. Input Signal: 4 - 20 mA DC.
 2. Display: Furnish integral digital display to indicate output voltage, output frequency, and output current.
 3. Status Indicators: Separate indicators for overcurrent, overvoltage, ground fault, overtemperature, and input power ON.
 4. Volts Per Hertz Adjustment: Plus or minus 10 percent.
 5. Current Limit Adjustment: 60 - 110 percent of rated.
 6. Acceleration Rate Adjustment: 0.5 - 30 seconds.
 7. Deceleration Rate Adjustment: 1 - 30 seconds.
 8. HAND-OFF-AUTOMATIC selector switch and manual speed control.
 9. Control Power Source: Integral control transformer.
- F. Safeties and Interlocks:
1. Includes undervoltage release.
 2. Door Interlocks: Mechanical means to prevent opening of equipment with power connected, or to disconnect power when door is opened; include means for defeating interlock by qualified persons.
 3. Safety Interlocks: Terminals for remote contact to inhibit starting under both manual and automatic mode.
 4. Control Interlocks: Furnish terminals for remote contact to allow starting in automatic mode.
 5. Manual Bypass: Includes contactor, motor running overload protection, and short circuit protection for full voltage, non-reversing operation of motor. Includes isolation switch to allow maintenance of inverter during bypass operation.
 6. Emergency Stop: Use dynamic brakes for emergency stop function.
 7. Disconnecting Means: Integral fused disconnect switch with clips for NEMA FU 1, Class J fuses on line side of each controller.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

- G. Fabrication:
 - 1. Wiring Terminations: Match conductor materials and sizes as indicated on Drawings.
 - 2. Enclosure: NEMA 250, Type 1, suitable for equipment application in places accessible only to qualified personnel.
 - 3. Finish: Manufacturer's standard enamel.
- H. Accessories:
 - 1. Include 3% input line reactor.
 - 2. Include 3% output load reactor.
 - 3. Include Ethernet IP communications module.
 - 4. Include 18 pulse phase shifting transformer.

2.2 SOURCE QUALITY CONTROL

- A. Shop inspect and perform standard production tests for each controller.
- B. Make completed controllers available for inspection at manufacturer's factory prior to packaging for shipment. Notify Owner and Architect/Engineer at least seven days before inspection is allowed.
- C. Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify Owner and Architect/Engineer at least seven days before inspections and tests are scheduled.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify building environment is maintained within service conditions required by manufacturer.

3.2 EXISTING WORK

- A. Disconnect and remove abandoned controllers.

3.3 INSTALLATION

- A. Install in accordance with NEMA ICS 7.1.
- B. Tighten accessible connections and mechanical fasteners after placing controller.
- C. Install fuses in fusible switches.
- D. Select and install overload heater elements in motor controllers to match installed motor characteristics.
- E. Install engraved plastic nameplates in accordance with Section 260553.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

- F. Neatly type label inside controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating. Place label in clear plastic holder.
- G. Ground and bond controller in accordance with Section 260526.

3.4 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.16 and NEMA ICS 7.1.

3.5 MANUFACTURER'S FIELD SERVICES

- A. Section 014000 - Quality Requirements: Manufacturer's field services.
- B. Prepare and startup variable frequency controller.

3.6 DEMONSTRATION AND TRAINING

- A. Furnish 2 hours of instruction each for two persons, to be conducted at project site with manufacturer's representative.

END OF SECTION

SECTION 265100 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes interior luminaires, lamps, ballasts, and accessories.
- B. Related Sections:
 - 1. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 2. Section 260533 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. C78.377-2011 (or latest), American National Standard for the Chromaticity of Solid State Lighting Products.
 - 2. C82.77-2002 (or latest), American National Standard for Harmonic Emission Limits - Related Power Quality Requirements for Lighting Equipment.
 - 3. C136.2-2014 (or latest), American National Standard for Roadway and Area Lighting Equipment – Dielectric Withstand and Electrical Immunity Requirements.
 - 4. Tested to IESNA LM-79-08 Testing Standards.
 - 5. NRTL Listed for Damp Location.
- B. ENERGY STAR®
 - 1. ENERGY STAR TM-21 Calculator, rev. 020712 (or latest, www.energystar.gov/TM-21Calculator)
- C. Federal Communications Commission (FCC)
 - 1. 47 CFR Part 15, Telecommunication – Radio Frequency Devices
- D. Federal Trade Commission (FTC)
 - 1. Complying with the Made in USA Standard, December 1998 (<http://business.ftc.gov/advertising-and-marketing/made-usa>)
 - 2. Green Guides, 16 CFR Part 260, Guides for the Use of Environmental Marketing Claims
- E. Illuminating Engineering Society of North America (IESNA or IES)
 - 1. LM-63-02 (R2008 or latest), ANSI/IESNA Standard File Format for the Electronic Transfer of Photometric Data and Related Information
 - 2. LM-79-08 (or latest), IESNA Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products
 - 3. LM-80-08 (or latest), IESNA Approved Method for Measuring Lumen Maintenance of LED Light Sources
 - 4. TM-21-11 (or latest), Projecting Long Term Lumen Maintenance of LED Light Sources
- F. International Electrotechnical Commission (IEC)
 - 1. 60929 Annex E, Control Interface for Controllable Ballasts (0-10V)
 - 2. 62386, Digital Addressable Lighting Interface (DALI)

SECTION 265100 - INTERIOR LIGHTING

- G. National Electrical Manufacturers Association (NEMA)
 - 1. LSD 63-2012, Measurement Methods and Performance Variation for Verification Testing of General Purpose Lamps and Systems
- H. Underwriters Laboratories (UL)
 - 1. 1998 Third Edition (or latest), Luminaires

1.3 DEFINITIONS

- A. Lighting terminology used herein is defined in IES RP-16. See referenced documents for additional definitions.
- B. Exception: The term “driver” is used herein to broadly cover both drivers and power supplies, where applicable.
- C. Clarification: The term “LED light source(s)” is used herein per IES LM-80 and TM-21 to broadly cover LED package(s), module(s), and array(s).

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate dimensions and components for each luminaire not standard product of manufacturer.
- C. Product Data: Submit dimensions, ratings, and performance data.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.7 MAINTENANCE MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish two of each plastic lens type.
- C. Furnish two of each ballast type.

PART 2 - PRODUCTS

2.1 INTERIOR LUMINAIRES

- A. Product Description: Complete interior luminaire assemblies, with features, options, and accessories as scheduled.

SECTION 265100 - INTERIOR LIGHTING

- B. Refer to Section 016000 - Product Requirements for product options. Substitutions are not permitted.

2.2 LED LIGHT ENGINE:

- A. High efficacy LED engine equipped with brand-name LEDs available in outputs of 100%, 85%, 70% and 55%.
 - 1. 1L35 (100%)
 - a. All drivers are Electronic Class 2, high efficiency with the following PFC:
 - 1) Standard Non-Dimming Driver (PFC>0.95).
- B. CCT packages shall be available in 2700K, 3000K, 3500K and 4000K. CCT tolerances are to be kept within a 3-step MacAdam ellipse and are to maintain a Min CRI of 80.
 - 1. 27 (2700K)
 - 2. 30 (3000K)
 - 3. 35 (3500K)
 - 4. 40 (4000K)

PART 3 - EXECUTION

3.1 EXISTING WORK

- A. Disconnect and remove abandoned luminaires, lamps, and accessories.

3.2 INSTALLATION

- A. Install suspended luminaires using pendants supported from swivel hangers. Install pendant length required to suspend luminaire at indicated height.
- B. Support luminaires larger than 2 x 4 foot size independent of ceiling framing.
- C. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- D. Install recessed luminaires to permit removal from below.
- E. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
- F. Install clips to secure recessed grid-supported luminaires in place.
- G. Install wall-mounted luminaires at height as indicated on Drawings.
- H. Install accessories furnished with each luminaire.
- I. Connect luminaires to branch circuit outlets provided under Section 260533 using flexible conduit.
- J. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

SECTION 265100 - INTERIOR LIGHTING

- K. Install specified lamps in each luminaire.
- L. Interface with air handling accessories furnished and installed under Section 233700.
- M. Ground and bond interior luminaires in accordance with Section 260526.

3.3 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.4 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Aim and adjust luminaires as indicated on Drawings. Coordinate final aiming in field with Architect/Owner.

3.5 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Remove dirt and debris from enclosures.
- C. Clean photometric control surfaces as recommended by manufacturer.
- D. Clean finishes and touch up damage.

3.6 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Protecting finished work.
- B. Relamp luminaires having failed lamps at Substantial Completion.

END OF SECTION

SECTION 337173 - ELECTRICAL UTILITY SERVICE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Arrangements with Utility Company for electric service feeder replacement.
 - 2. Payment of Utility Company for service modification charges.
 - 3. Portable generator connection.
 - 4. Preventative maintenance of service switchgear and transformer.
- B. Related Requirements:
 - 1. Section 260503 – Equipment Wiring Connections.
 - 2. Section 260526 – Grounding and Bonding for Electrical Systems.
 - 3. Section 260533 – Raceway and Boxes for Electrical Systems.
 - 4. Section 262819 – Enclosed Switches

1.2 DEFINITIONS

- A. Utility Company: National Grid.

1.3 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate/verify all service related issues with the local utility prior to any installation.
- C. All installation shall be in accordance with the N.E.C., local utility, State, Town and local jurisdiction requirements.
- D. Coordinate Work of this Section with Utility Company, including relocation of overhead or underground lines interfering with construction.
- E. If power lines are to be relocated, bill utility costs directly to Owner.
- F. Service Installation:
 - 1. Contact Utility Company regarding charges related to service installation, and include charges in Contract.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Submit drawings prepared by Utility Company.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

SECTION 337173 - ELECTRICAL UTILITY SERVICE

1.5 QUALITY ASSURANCE

- A. Perform Work according to Utility Company written requirements, and maintain one copy at Site.

1.6 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on Drawings.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. System Characteristics: 4160 V, three phase, four wire, 60 Hz.
- B. Service Entrance: Underground.

2.2 PORTABLE GENERATOR DISCONNECT

- A. Provide and install a 600V, 400A, 3 phase, 4 pole, weatherproof disconnect switch as shown on the drawings.
 - 1. Provide three (3) 4" capped nipples in bottom of disconnect switch.
 - 2. Use for temporary power during service feeder replacement and preventative maintenance of service switchgear and transformer. Provide temporary wiring to existing indoor switchgear as field required.
 - 3. Provide and install conduits and wiring to proposed distribution panel HVP-1.

2.3 PREVENTATIVE MAINTENANCE OF SERVICE SWITCHGEAR AND TRANSFORMER

- A. The existing outdoor switchgear consists of components:
 - 1. 4160V service entrance section with primary switch.
 - 2. Utility metering section.
 - 3. 4160v distribution section with secondary fused switch.
 - 4. Relay cabinet
 - 5. Westinghouse type "SL" Power Center Transformer, Cira 1967, Oil filled transformer
 - a. 1000KVA
 - b. Primary Voltage: 4160V, 3 phase, 3 wire
 - c. Secondary Voltage: 480V, 3 phase, 3 wire
- B. Contractor to provide a complete infrared inspection and report on all components.
- C. Contractor to clean and lubricate all components.
- D. Contractor to inspect and test all relays.
- E. Contractor to inspect transformer, take an oil sample, test sample, and provide a report.

SECTION 337173 - ELECTRICAL UTILITY SERVICE

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that service equipment is ready to be connected and energized.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Inspect existing spare conduit and pull a mouse through to verify integrity of conduit for proposed feeder installation.
- C. Provide and install service riser at utility pole per NGRID requirements
- D. Remove exposed abandoned service entrance raceway and conductors. Cut raceway flush with walls and floors, and patch surfaces.
- E. Disconnect and remove abandoned service equipment.
- F. Maintain access to existing service equipment, boxes, metering equipment, and other installations remaining active and requiring access, by modifying installation or by providing access panel.
- G. Extend existing service installations using materials and methods compatible with existing electrical installations, or as specified.
- H. Clean and repair existing service equipment to remain or to be reinstalled.

3.3 INSTALLATION

- A. Conductors:
 - 1. Install from Utility Company's service entrance equipment.

END OF SECTION

SECTION 337900 - SITE GROUNDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rod electrodes.
 - 2. Exothermic connections.
 - 3. Mechanical connectors.
 - 4. Wire.
- B. Related Requirements:
 - 1. Section 260526 – Grounding and Bonding for Electrical Systems.

1.2 REFERENCE STANDARDS

- A. The Institute of Electrical and Electronics Engineers, Inc.:
 - 1. IEEE 80 - Approved Draft Guide for Safety in AC Substation Grounding.
 - 2. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
- B. InterNational Electrical Testing Association:
 - 1. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for grounding electrodes and connectors.
- C. Shop Drawings: Indicate layout and installation details of grounding components.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Test and Evaluation Reports: Indicate overall resistance-to-ground.
- F. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- H. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of electrodes and connections.

SECTION 337900 - SITE GROUNDING

1.5 QUALITY ASSURANCE

- A. Comply with IEEE 142.
- B. Substation Grounding: Comply with IEEE 80.
- C. Perform Work according to current NEC standards.
- D. Maintain two copies of each standard affecting Work of this Section on Site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. Multiple rod electrodes buried in circular pattern around perimeter of pads at intersections of horizontal electrode grid.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Overall Resistance-to-Ground: 5 ohms.

2.3 ROD ELECTRODES

- A. Manufacturers:
 - 1. ERICO International Corporation
 - 2. Harger Lightning & Grounding
 - 3. Substitutions: As specified in Specified in Section 016000 - Product Requirements.
- B. Description: Copper-clad steel ground rods.
- C. Diameter: 3/4 inch.
- D. Length: 10 feet.

2.4 EXOTHERMIC CONNECTIONS

- A. Manufacturers:
 - 1. Burndy
 - 2. ERICO International Corporation
 - 3. Harger Lightning & Grounding
 - 4. Substitutions: As specified in Specified in Section 016000 - Product Requirements.
- B. Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

SECTION 337900 - SITE GROUNDING

2.5 MECHANICAL CONNECTORS

- A. Manufacturers:
 - 1. Burndy
 - 2. ERICO International Corporation
 - 3. Galvan Industries, Inc.
 - 4. Harger Lightning & Grounding
 - 5. Substitutions: As specified in Specified in Section 016000 - Product Requirements.
- B. Description: Bronze connectors, suitable for grounding and bonding applications, and in configurations required for particular installation.

2.6 WIRE

- A. Material: Stranded copper.
- B. Minimum Size of Horizontal Electrodes: 2/0 AWG.
- C. Minimum Size of Connections to Electrodes: 2/0 AWG.
- D. Minimum Size of Bonding to Other Objects: 2/0 AWG.
- E. Mechanical Connectors: Bronze.
- F. Grounding Boxes: Bronze.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that final backfill and final compaction have been completed before driving rod electrodes.
- C. Verify that trenching has been completed before installing horizontal electrodes.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Remove exposed and abandoned grounding components by cutting conductors flush with grade and pavement, and then patching surfaces.
- C. Existing Installations:
 - 1. Provide access to existing grounding electrodes, connections, and other installations remaining active and requiring access.
 - 2. Modify installation.

SECTION 337900 - SITE GROUNDING

- D. Extend existing Site grounding installations using materials and methods compatible with existing installations, or as specified.
- E. Clean and repair existing remaining grounding connections.

3.3 INSTALLATION

- A. Install rod electrodes in vertical position with bottom at least 5 feet below frost line.
- B. Install interconnecting wire 2 feet below finished grade level.
- C. Install grounding wells as indicated on Drawings.
- D. Construct concrete well as specified in Section 033000 - Cast-in-Place Concrete.
- E. Install grounding conductors to water lines and gas lines per NEC requirements.

3.4 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- B. Inspect and test according to NETA ATS, except Section 4.
- C. Perform inspections and tests as listed in NETA ATS, Section 7.13.

3.5 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate location of each accessible grounding connection.

END OF SECTION

APPENDIX A

PRE-PURCHASED GENERATOR AND TRANSFER SWITCHES

TRANSMITTAL



Transmittal number	1	Date	12/14/2023
Project	Lockport RAW Water Genera	One Locks Plaza Lockport, NY 14094	
Project number	23-4088-00		
To	Chris Freese, Nussbaumer & Clarke Inc. Work phone 1 (402) 415-4274 3556 Lake Shore Road Fax 1 (716) 826-7958 Suite 500 cfreese@nussclarke.com Buffalo, NY 14219-1494		
Cc			
From	Frey Electric Construction	100 Pearce Ave Tonawanda, NY 14150	

We are sending	Engine Generator Submittal		
For the purpose of	For approval		
Sent via	E-Mail	Reference	Attached

Copies	Date	Description
1	12/14/2023	Electronic Submittal

Remarks	
By	Jack Lasher

SUBMITTAL



Submittal number	1.0	Date	12/14/2023
Project	Lockport RAW Water Genera	One Locks Plaza Lockport, NY 14094	
Project number	23-4088-00		
Spec section	263213 (Engine Generators)		
Subsection		Status	Open
Current action	Not yet submitted	Ball in court	
Topic	Engine Generator Submittal		

Submitter	Jack Lasher
Reviewer	Chris Freese
Cc	

Date submitted	12/14/2023	Submission due date	
Released for review		Review due date	
Date returned		Required on site date	
Date released			

Notes
DRAWING XZG3000100136 WAS REVISED AND SENT TO NUSSBAUMER. IT IS INSERTED INTO THIS SUBMITTAL.

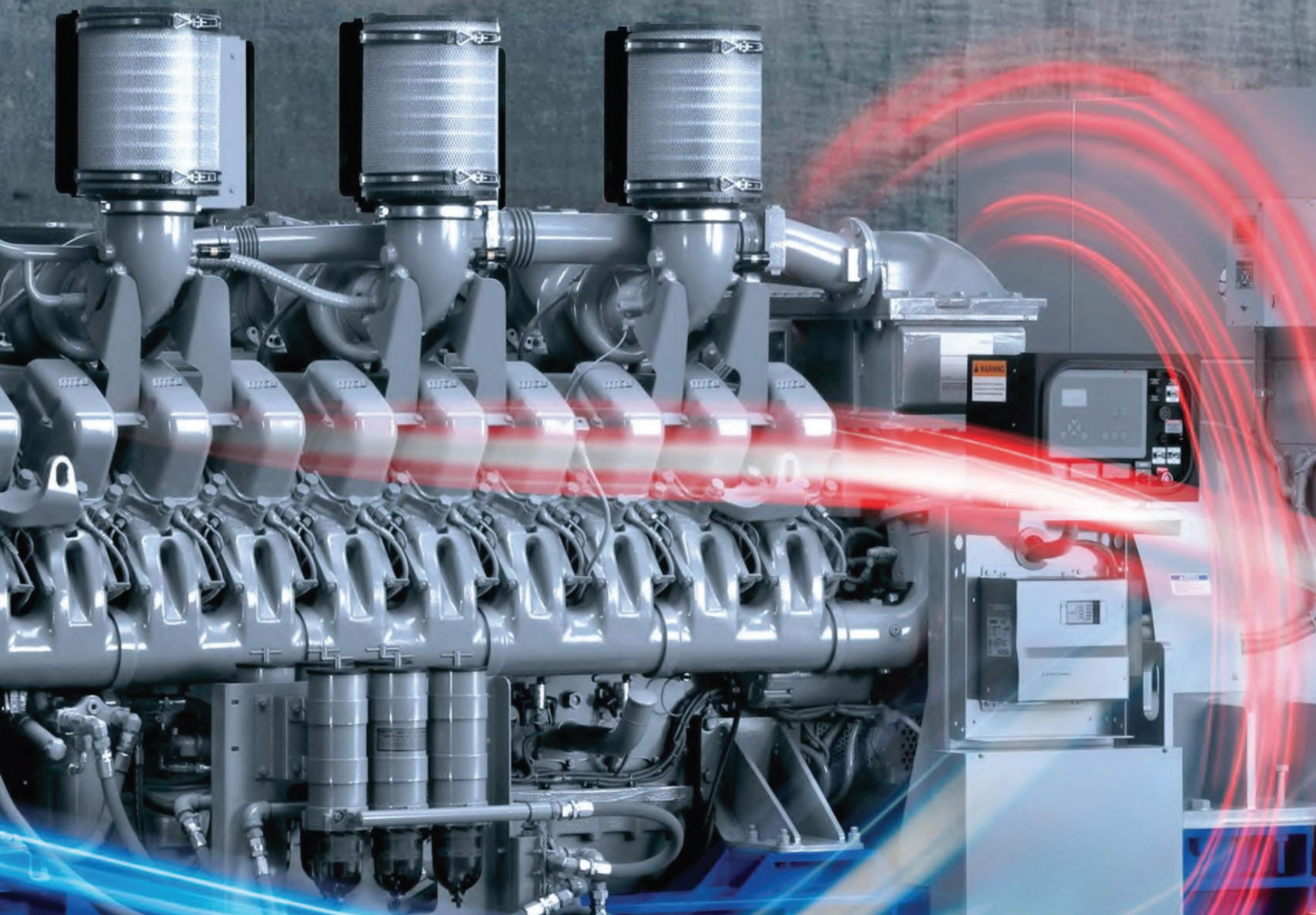


LOCKPORT PUMP STATION

Presented To: Frey Electric
100 Pearce Avenue
Tonawanda, New York 14150



December 13, 2023





SUBMITTAL TABLE OF CONTENTS

EQUIPMENT DETAIL

Lockport Pump Station
Weight Calculation

DRAWINGS

Drawing: Enclosure
Drawing: Generator Detail
Drawing: Sub-Base Fuel Tank
Drawing: Composite
Drawing: Automatic Transfer Switch
Customer Connection Diagram

DOCUMENTATION

Curtis Power Solutions (Distributor)
MTU On-Site Energy Company Profile (Manufacture)
ISO Certification, UL Certification
Engine Emission Certification
IBC Seismic Certification
PAC – Test Sheet Procedures and Methods
ASCO Warranty
Two Year MTU Warranty

SPECIFICATION SHEETS

Generator: MTU_6RJ225-DS400_400kW_Standby
Alternator: 433 / 6220 (130 Degree Rise)
Excitation PMG, DVR 2400
Control Panel: Digital MGC-2020
Breaker: 700 AMP
Enclosure
Silencer
Fuel Tank
Air Filter
Battery
Battery Charger
Coolant Heater
Pad Vibration Isolators

AUTOMATIC TRANSFER SWITCH

ASCO: G3ATSA31600NGC

STARTUP CHECKLIST

Installation Startup Checklist



Curtis Power Solutions Company
401 O'Neill Drive
Quakertown, PA 18951
215 - 536 - 4973

EQUIPMENT BILL OF MATERIAL

Model Number: DG6RJ225-DS400

Ratings:

KW: 400
KVA: 500
P.F.: 0.8
Frequency: 60Hz
Engine Speed: 1800 RPM
Application: Standby Power

Engine:

Displacement: 13.5 Liter
Fuel Type: Diesel Ultra Low Sulfur
Engine Voltage: 24

Generator:

Model Number: 433 / 6220
Governor: Isochronous
Excitation: PMG
Voltage: 277/480
Phase: 3
Temp. Rise: 130 Degree C

Certifications:

UL Listing: UL2200
Seismic: IBC Seismic

Cooling System:

50 Degree C Cooling System
Closed loop, liquid cooled, with radiator factory mounted on engine-generator set mounting frame and integral engine driven coolant pump.

Control Panel:

Model MGC- 2020
Generator Set Digital Controller, designed to provide automatic starting, monitoring and control. Liquid Crystal Display (LCD) with backlighting. NFPA-110 Compatible, UL-508 Compatible.
Control Panel Mounted
Accessories:
4 Relay Kit

Circuit Breaker:

BREAKER - 1:
- Description: 700 AMP
- Rated: 100%
- Poles: 3
- Standard Lugs: 3/O - 500 MCM
- Model Number: PGL36080CU33A, LSI
- Mounting: Circuit Breaker is Factory installed

Starting Aids:

Battery Rack installed
Battery Charger : 10 AMP

Jacket Water Heater:

Negative 20 Deg. F Jacket Water Heater 208 Volt 1 PH 4000 Watt
Jacket Water Heater Mounted and AC Wired

Enclosure:

Weather proof enclosure constructed of heavy gauge Steel with fixed storm proof panels. Enclosure consists of a bolted and welded construction with unit-mounted silencer included, lockable double door access on both sides of the enclosure.

- Enclosure Type LEVEL-3
- Material Steel
- Sound Attenuation 75.5 dBA at 23FT,100% Load
- Wind Rating 130 MPH
- Louver Intake Fixed
- Louver Exhaust Fixed
- Lighting No
- Space Heater No
- Distribution Panel No
- Receptacle No
- Paint Color Grey

Exhaust System:

Exhaust Grade Critical
Mounted Internal

Fuel System:

UL Listed, double wall, sub-base fuel tank
72 Hour / 2100 Gallon

- Configuration: Extended
- 5 Gal. Spill/Fill: Included
- Electric Fuel Gauge (Panel Mounted),

Air Intake System:

Air Filter Standard
Blocked Filter Indicator

Vibration Isolation:

Vibration isolators: Pad

Accessories:

Extra Materials: FILTERS (Fuel, Lube, Air)
FUEL/WATER SEPARATOR

Documentation:

O&M Manuals:
Printed: None
Flash Drive: 1

Warranty:

2 Year / 3000 Hour
Basic

Start-up and Testing:

NFPA-110 Acceptance



Curtis Power Solutions Company
401 O'Neill Drive
Quakertown, PA 18951
215 - 536 - 4973

AUTOMATIC TRANSFER SWITCH:

ATS - 1 **ASCO**
 Open Transition
 1600 AMP
 480 Volt
 3 - Pole Solid Neutral
 85 kAIC Withstand Rating
NEMA - 1
Model: G3ATSA31600NGC
2 Year Warranty



Weight Estimator Tool

Diesel - Standard

Base Unit

(Default Weights based on 480V 3PH 130C Generator)

Please make selections in the order of sequence below as it applies to your specific project. Some options are not available on select models and will be reflected with an N/A and a weight of 0 lbs.

Step 1	// Model	DS400D6S 8V1600 ▼
Step 2	// 480V ¹	Yes ▼
Step 3	// Enclosure / Tank	L3 72Hr ▼
Step 4	// Intake Scoop	Included - Standard on L3 ▼
Step 5	// Exhaust Scoop	Included - Standard on L3 ▼
Step 6	// Exhaust System	ENC w/Critical Grade Exhaust ▼

Main Menu

Gas Models

Custom Diesel Models

Reset Calculator

Select Accessories

Step 7	// Standard Circuit Breaker	100% Rated ▼
Step 8	// -20° F Jacket Water Heater	Yes ▼
Step 9	// Battery (Wet)	Yes ▼
Step 10	// Battery Charger	NRG22-10 ▼
Step 11	// Heavy Duty Air Filter	No ▼

Optional Weight Adders

If there are additional weight additions for your project, you may manually enter them here. The weight entered will automatically be added to the total unit weight.

Please Note: The "Reset Calculator" button will reset the options back to their defaults.

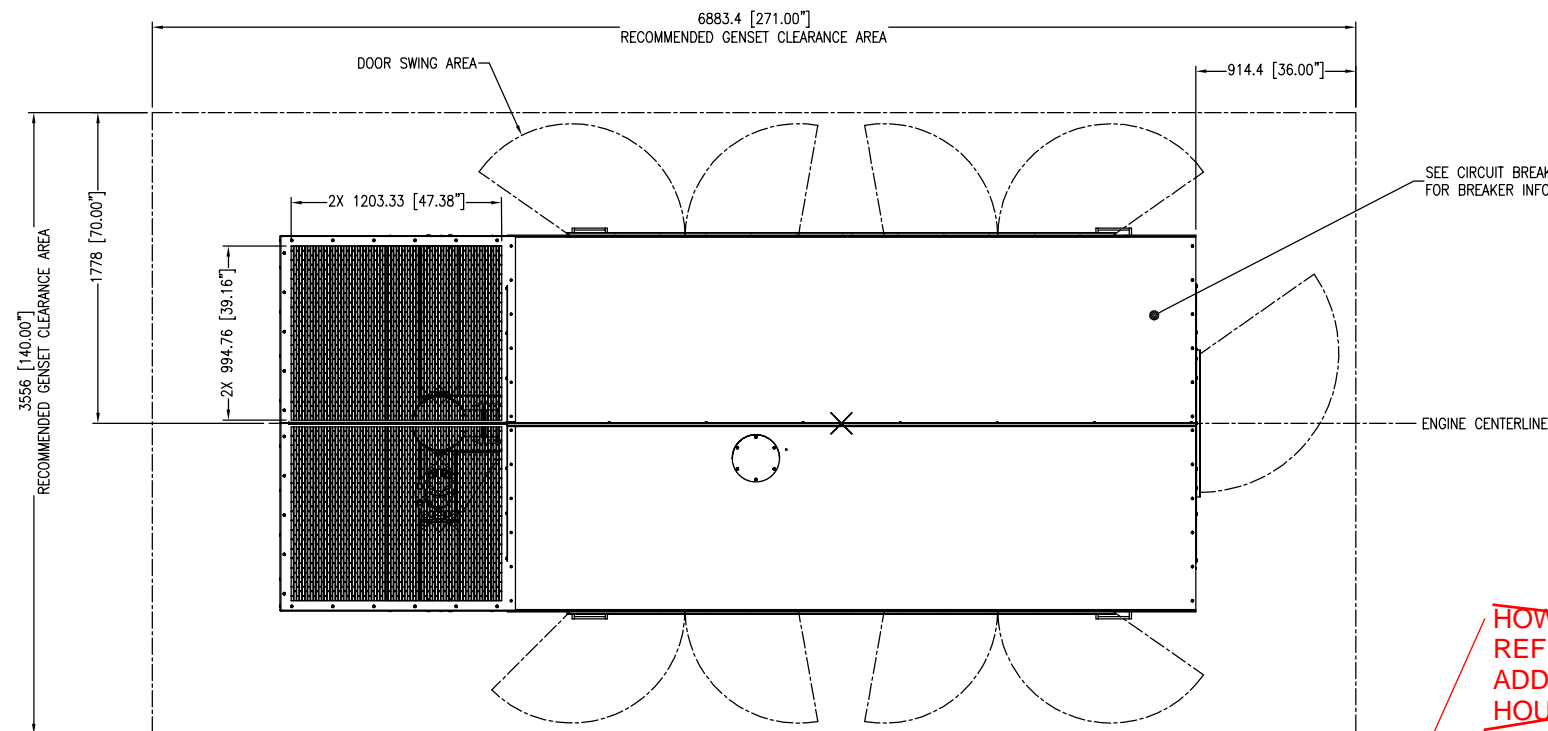
Step 12	Adder 1	Conversion to JD	252 lbs
Step 13	Adder 2	Safety Factor 5%	925 lbs
Step 14	Adder 3	Fuel Weight 2100 Gallons	15750 lbs

Total Unit Estimated Weight: 35176 Lbs.²

¹480V is MTU Onsite Energy's standard voltage. Weights for non-480V units assume the heaviest possible voltage configuration

²Calculated weights are for submittal purposes only and should not be used as final weight calculations. This tool provides a comprehensive unit weight and is not intended to provide weights for individual components.

ENCLOSURE



SEE CIRCUIT BREAKER ENCLOSURE DATA SHEET FOR BREAKER INFORMATION AND CONDUIT ENTRY

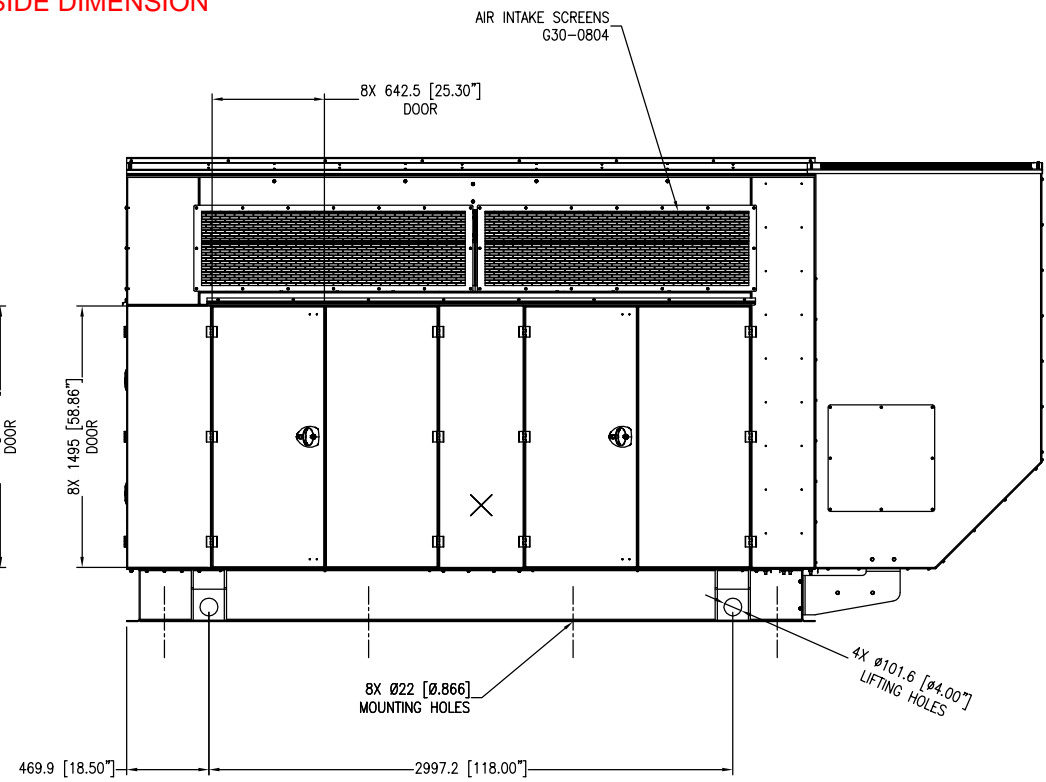
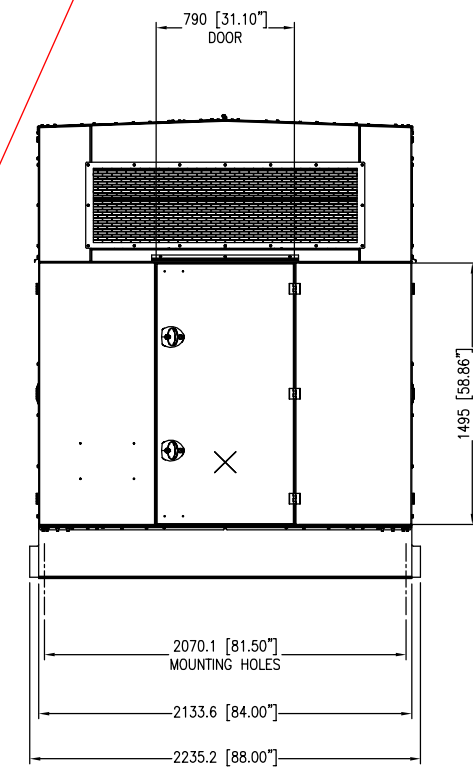
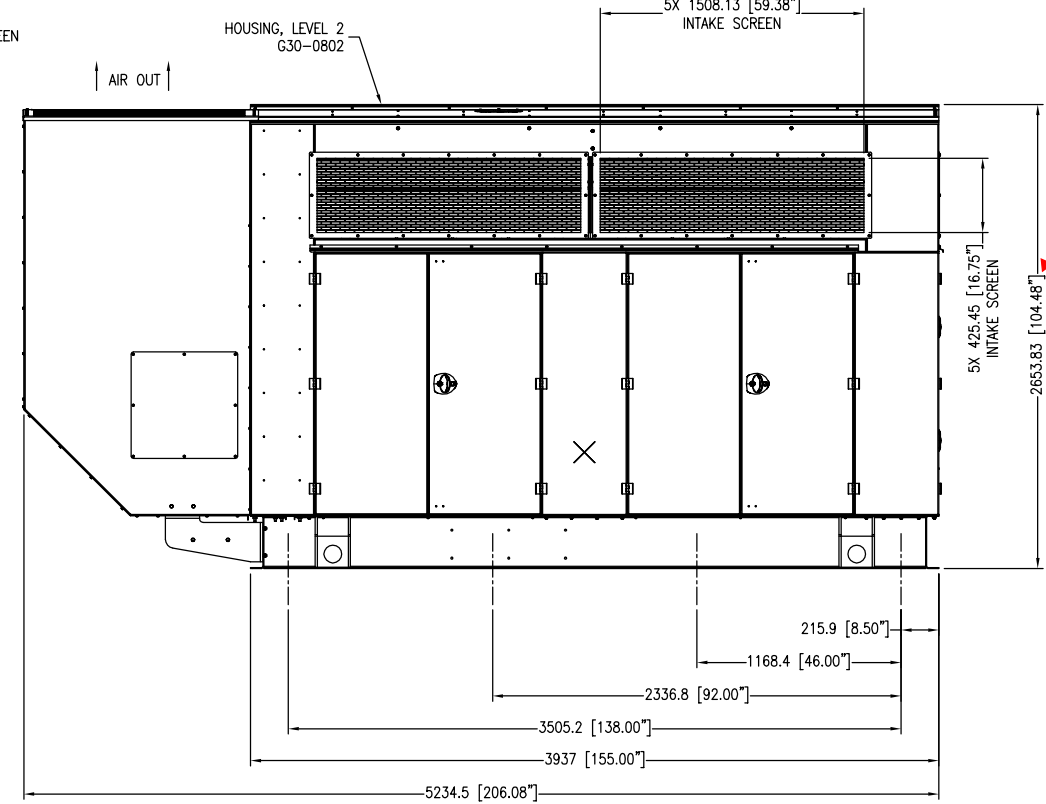
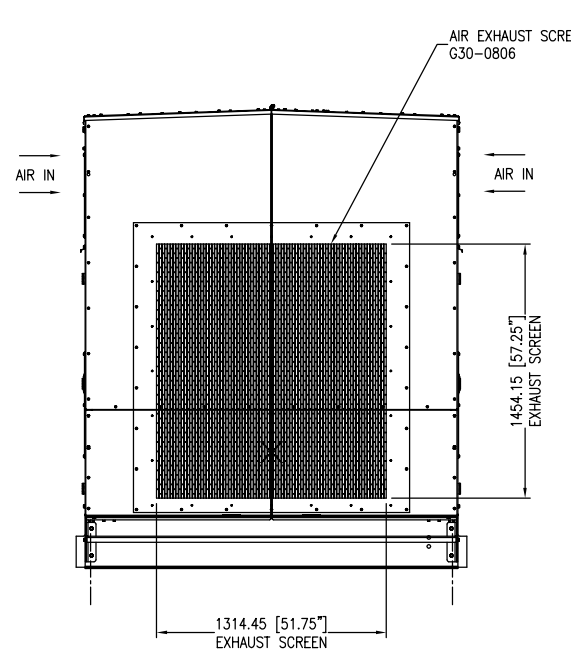
ENGINE CENTERLINE

		DRAWING OPTIONS	
GROUP	DRAWING CODE	DESCRIPTION	SELECTED OPTIONS
HOUSING OPTIONS, EXTERIOR	G30-0801	HOUSING, LEVEL 1	
	G30-0802	HOUSING, LEVEL 2	
	G30-0803	HOUSING, LEVEL 3	✓
	G30-0804	AIR INTAKE SCREENS (W/O MOTORIZED LOUVERS)	✓
	G30-0805	AIR INTAKE MOTORIZED LOUVERS	
	G30-0806	AIR EXHAUST SCREEN (W/O GRAVITY LOUVER)	✓
	G30-0807	AIR EXHAUST GRAVITY LOUVER	
HOUSING OPTIONS, INTERIOR	G30-0901	INTERIOR HOUSING LIGHTS	
	G30-0902	SPACE HEATER	

Reference the Drawing Options table and within the Layer Properties turn on/off the Drawing Codes that may or may not apply to your configuration.

Note: Some options may not be referenced. Only options which visibly change the drawing are selectable.

**HOW WILL SILENCER FIT INSIDE HOUSING?
REFER TO NEXT PAGE
ADDING SILENCER 95.18" + 16" (WITH WRONG SILENCER) = 111.18
HOUSING IS 104.48" OUTSIDE DIMENSION**



REVISION	DATE	DESCRIPTION
A	2020-04-01	UPDATED TITLE BLOCK

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APPLICABLE MODELS:
 MTU 6R0225 DS350
 MTU 6R0225 DS400

THIRD ANGLE PROJECTION

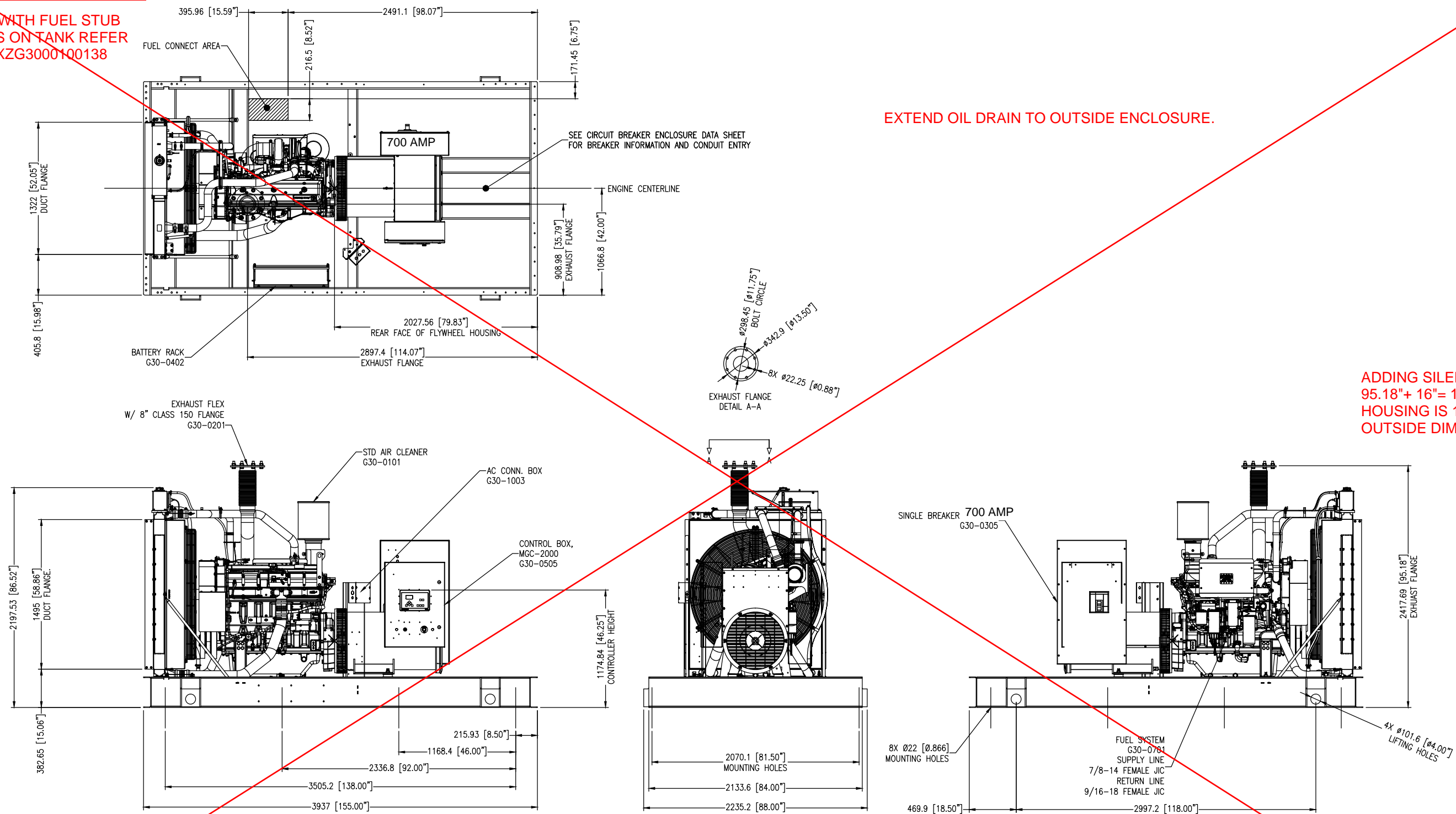
DRAWN TO SCALE
 DIMENSIONS: MM [INCH]

DATE CREATED:
 2018-11-09

DIMENSIONAL LAYOUT		
DESCRIPTION: 350-400 kW Genset Housed		
ENGINE: John Deere, JD6135	WEIGHT (MIN-MAX): 4511-5756 KG 9945-12690 LB	SHEET: 1 of 1
DRAWING NUMBER: XZG3000100137		

GENERATOR DETAIL

COORDINATE WITH FUEL STUB UP LOCATIONS ON TANK REFER TO DRAWING XZG3000100138



EXTEND OIL DRAIN TO OUTSIDE ENCLOSURE.

ADDING SILENCER
95.18" + 16" = 111.18"
HOUSING IS 104.48"
OUTSIDE DIMENSION

THIS DRAWING HAS BEEN REPLACED SEE NEXT PAGE

REVISION	DATE	DESCRIPTION
B	2020-04-01	UPDATED TITLE BLOCK
A	2019-08-21	CHANGED EXHAUST FLANGE DETAIL FROM 6" TO 8" FLANGE

mtu A Rolls-Royce solution

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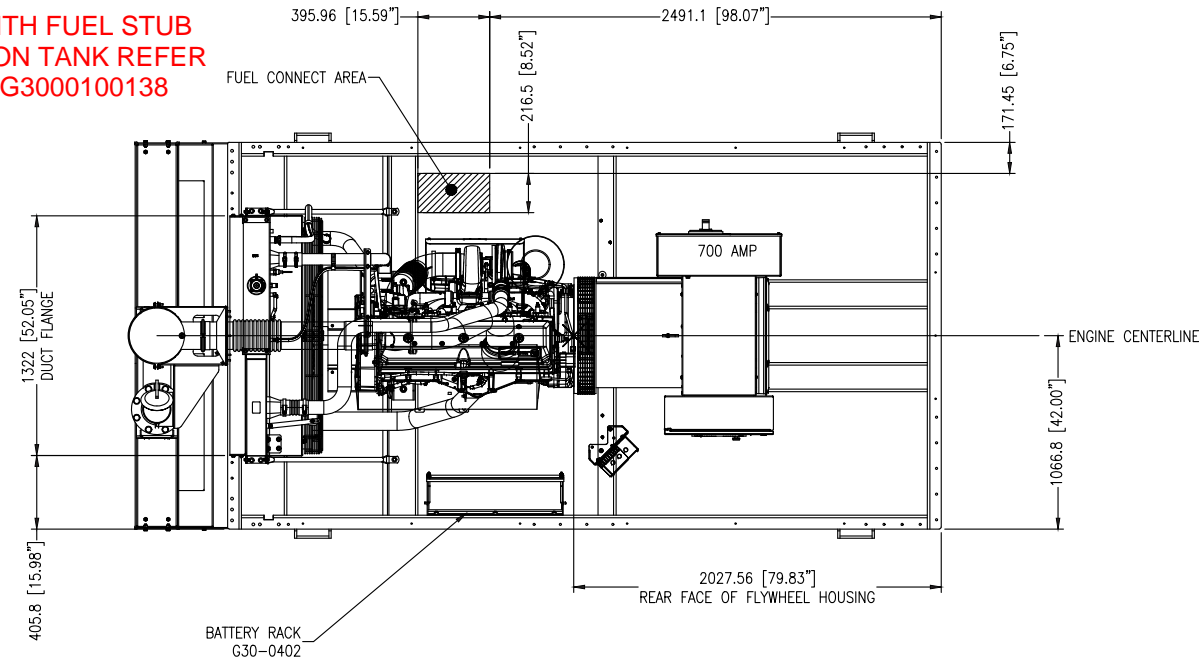
APPLICABLE MODELS:
MTU 6R0225 DS350 MTU 6R0225 DS400

THIRD ANGLE PROJECTION
DRAWN TO SCALE DIMENSIONS: MM [INCH]
DATE CREATED: 2018-11-09

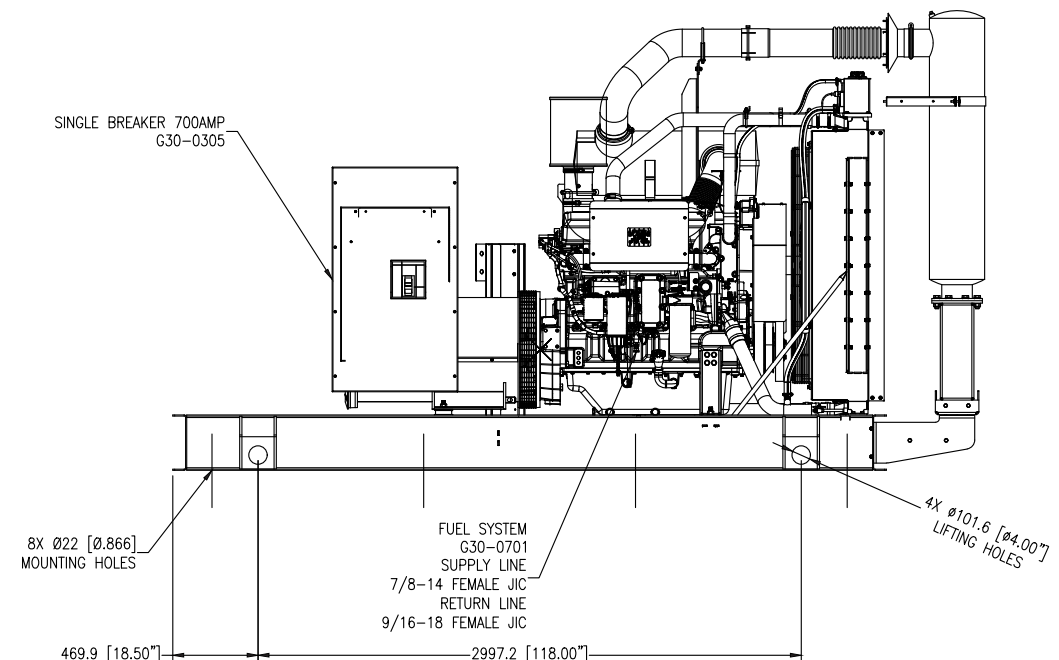
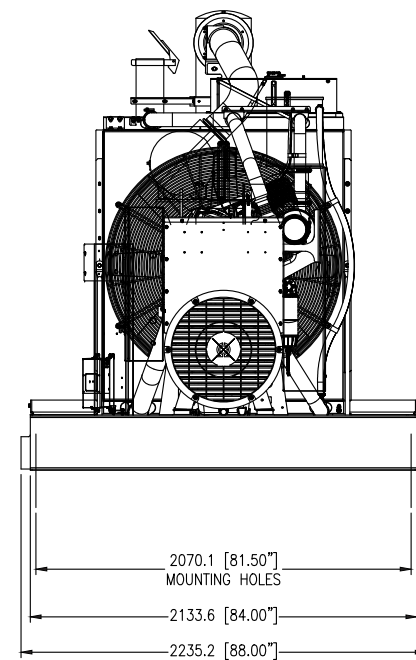
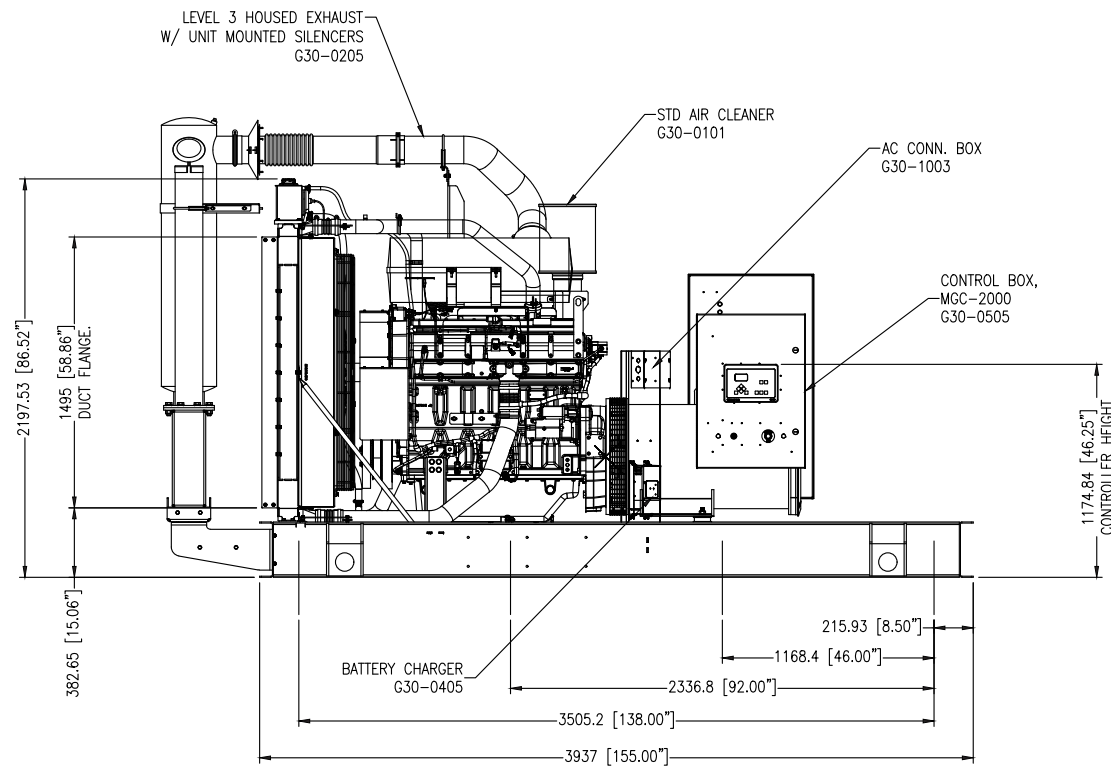
DIMENSIONAL LAYOUT	
DESCRIPTION: 350-400 kW Genset, HSD Base	WEIGHT (MIN-MAX): 3464-4105 KG 7637-9050 LB
ENGINE: John Deere, JD6135	SHEET: 1 of 2
DRAWING NUMBER: XZG3000100136	

GENERATOR DETAIL

COORDINATE WITH FUEL STUB UP LOCATIONS ON TANK REFER TO DRAWING XZG3000100138



EXTEND OIL DRAIN TO OUTSIDE ENCLOSURE.



REVISION	DATE	DESCRIPTION
B	2020-04-01	UPDATED TITLE BLOCK
A	2019-08-21	CHANGED EXHAUST FLANGE DETAIL FROM 6" TO 8" FLANGE

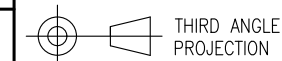


A Rolls-Royce solution

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APPLICABLE MODELS:

MTU 6R0225 DS350
MTU 6R0225 DS400



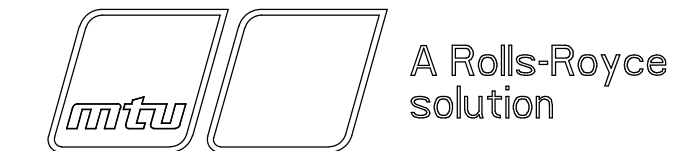
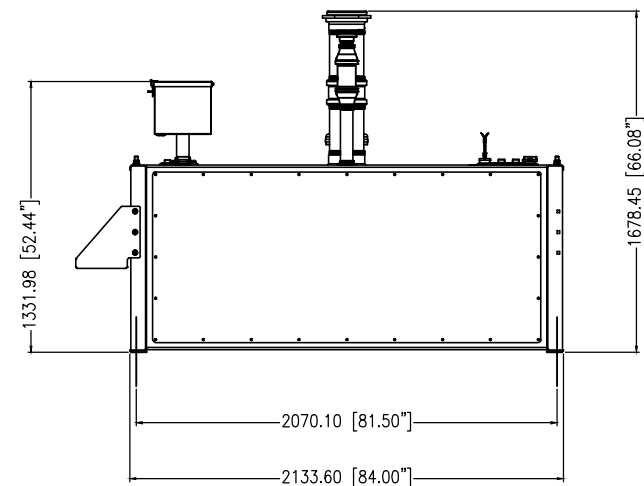
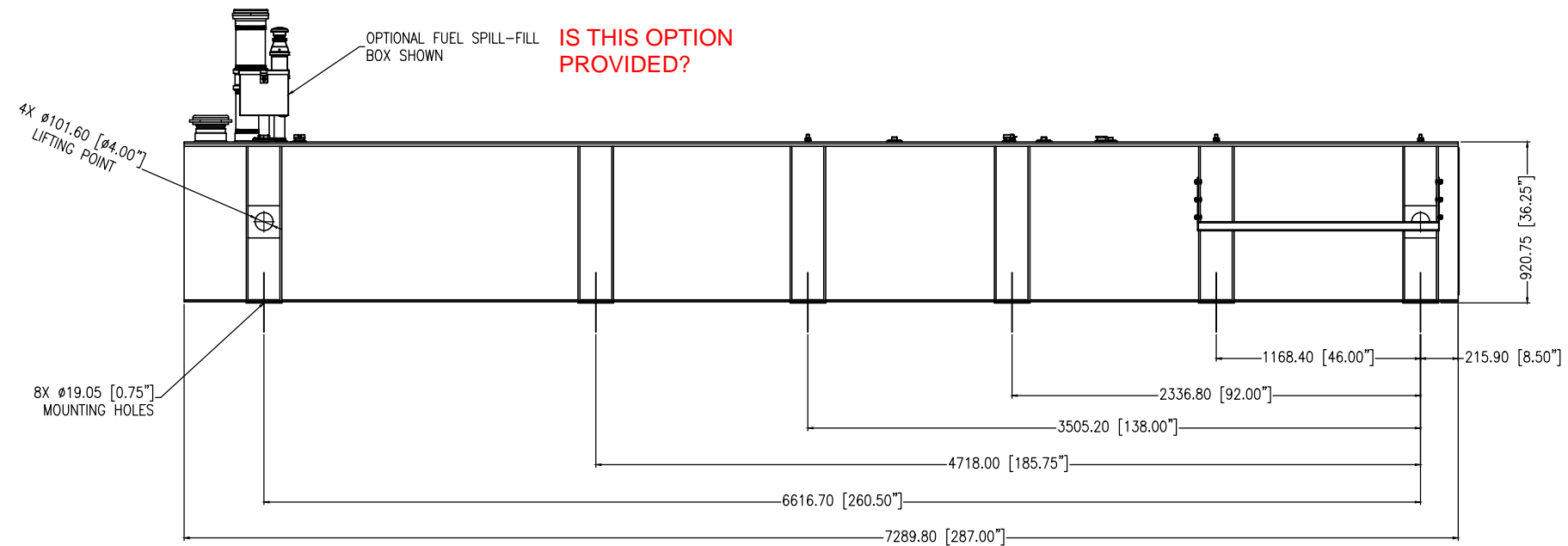
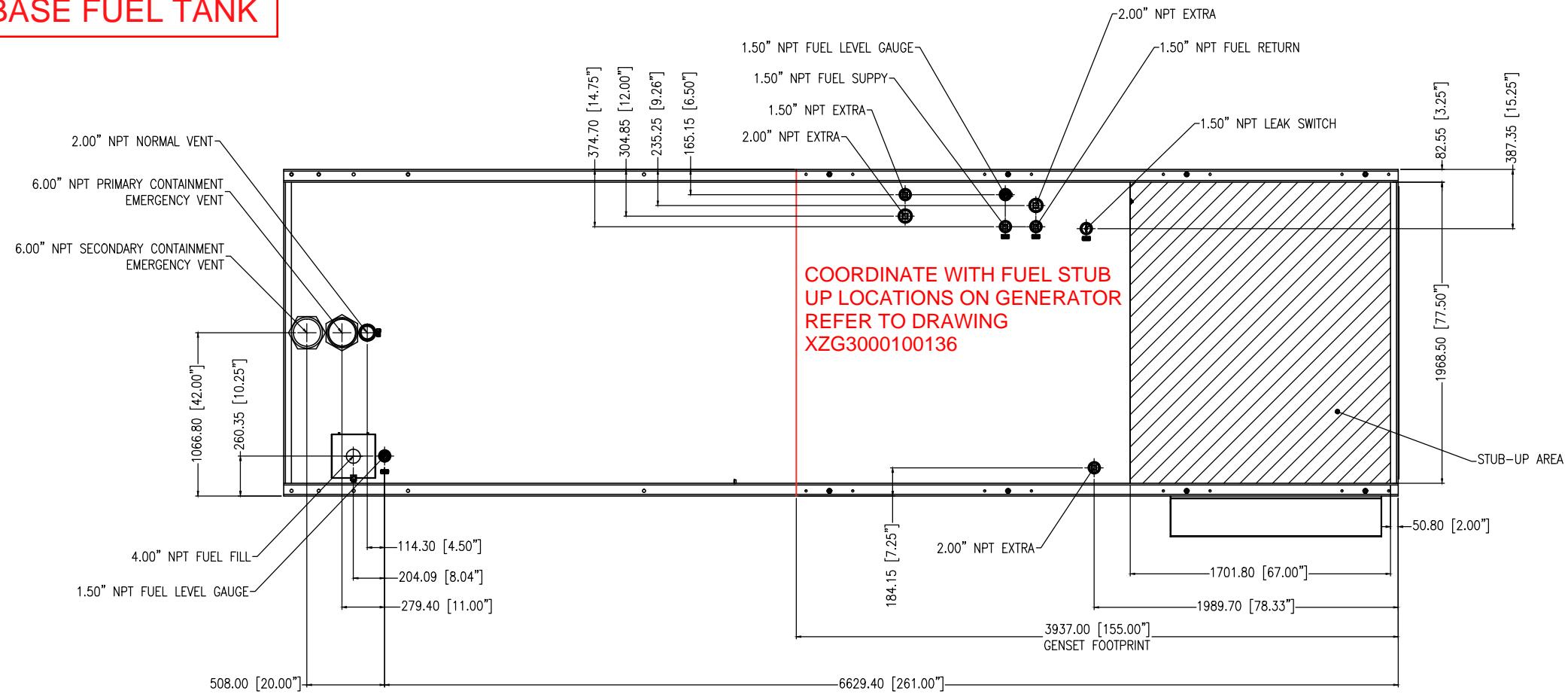
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DIMENSIONS: MM [INCH]

DATE CREATED:
2018-11-09

DIMENSIONAL LAYOUT

DESCRIPTION: 350-400 kW Genset, HSD Base	WEIGHT (MIN-MAX): 3464-4105 KG 7637-9050 LB
ENGINE: John Deere, JD6135	SHEET: 1 of 2
DRAWING NUMBER: XZG3000100136	

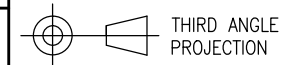
SUB-BASE FUEL TANK



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APPLICABLE MODELS:

MTU 6R0225 DS350
MTU 6R0225 DS400



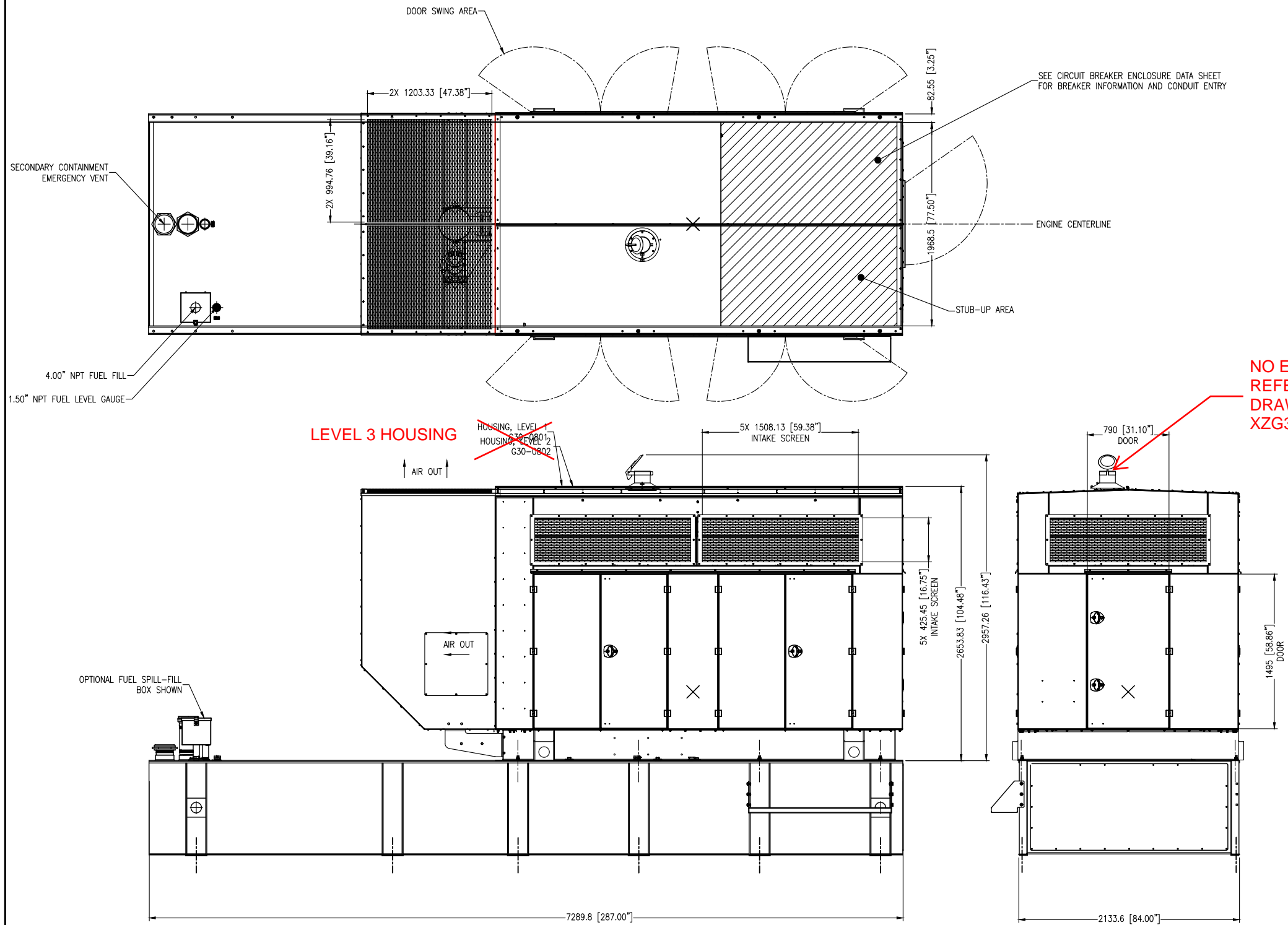
THIRD ANGLE PROJECTION

DIMENSIONAL LAYOUT

DESCRIPTION: 350-400 kW, 72hr, 2100gal, Ext, IBC	
ENGINE: John Deere, JD6135	WEIGHT (MIN-MAX): 2729 KG [6016 LB]
DATE CREATED: 2018-11-30	DRAWING NUMBER: XZG3000100138
SHEET: 12 of 12	

REVISION	DATE	DESCRIPTION
B	2020-04-01	UPDATED TITLE BLOCK
A	2018-12-06	Corrected tank capacities to display nominal values


COMPOSITE



EXTEND OIL DRAIN TO OUTSIDE ENCLOSURE.

NO EXHAUST FLAPPED
REFER TO REVISED
DRAWING
XZG3000100136

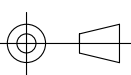
JwL	6/9/2020	COMPOSITE DRAWING
A	2020-04-01	UPDATED TITLE BLOCK
REVISION	DATE	DESCRIPTION



A Rolls-Royce solution

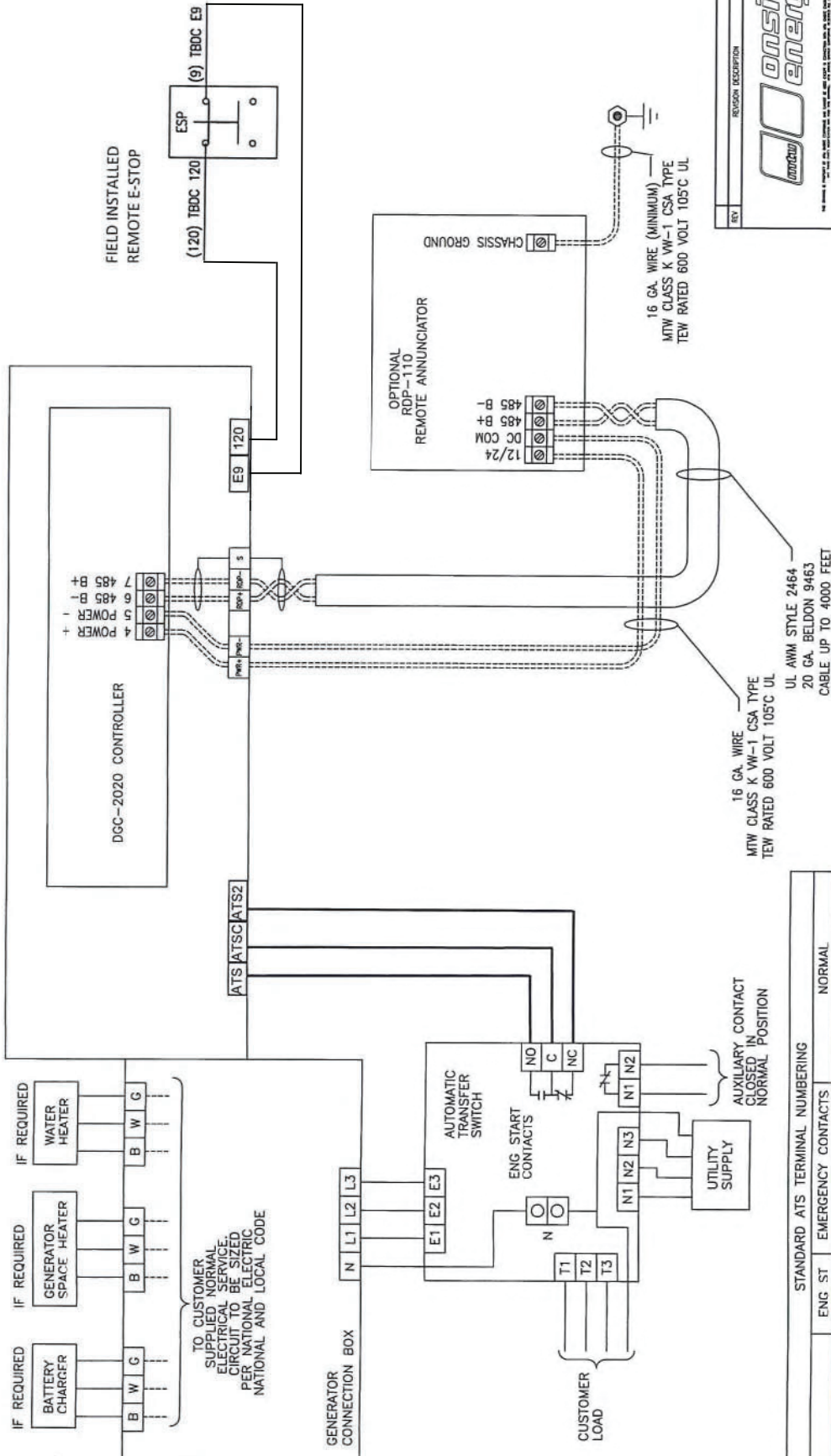
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APPLICABLE MODELS:
MTU 6R0225 DS350
MTU 6R0225 DS400

 THIRD ANGLE PROJECTION
DRAWN TO SCALE
DIMENSIONS: MM [INCH]
DATE CREATED:
2018-11-09

DIMENSIONAL LAYOUT	
DESCRIPTION: 350-400 kW Genset Housed	
ENGINE: John Deere, JD6135	WEIGHT (MIN-MAX): 4511-5756 KG 9945-12690 LB
DRAWING NUMBER: XZG3000100137	SHEET: 1 of 1

CUSTOMER CONNECTION DIAGRAM



MAKE	ENG ST	EMERGENCY CONTACTS	NORMAL
ZENITH	1 & 2	A3-1 & A3-2 NO & NC	A4-1 & A4-2 NC & NO
ASCO 4000 < 260 AMP	14 & 15	27-28 OR 30-31	27-29 OR 30-32
ASCO 7000 < 260 AMP	14 & 15	8-9 OR 10-11	4-5 OR 6-7
ASCO 4000 > 260 AMP	1 & 2	27-28 OR 30-31	27-29 OR 30-32
ASCO 7000 > 260 AMP	1 & 2	8-9 OR 10-11	4-5 OR 6-7
ASCO 300	14 & 15	10-11	12-13

REV	REVISION DESCRIPTION	DATE	BY

****SPECIAL NOTE****
 TO MINIMIZE ANY ELECTRICAL NOISE BEING INTRODUCED INTO THE ENGINE CONTROLLER, CONTROL WIRING AND AC POWER WIRING SHOULD BE RUN IN SEPARATE CIRCUITS.
 ENGINE: N/A
 GENERATOR: N/A
 REGULATOR: N/A
 CONTROL PANEL: DGC-2020
 VOLTAGE: 240VAC
 GOVERNOR: N/A

DGC-2020 CONNECTION DIAGRAM

DATE: 12-14-11 DRAWING SIZE: B-SIZE
 DRAWN BY: ECE SHEET: 1 OF 1

SYSTEM INTERCONNECTS



Curtis Power Solutions Company

Quakertown Pennsylvania Division
401 O'Neill Drive
Quakertown, PA 18951

1 866 GEN-POWR (436-7697) ☎ 215 536-4973 (in Eastern PA)
www.emergencysystems-inc.com

Curtis Power Solutions Company - Quakertown Pennsylvania Division is Proud to be Providing Emergency Power for our Delaware and Lehigh Valleys Customer Base for over **49 Years!** We Specialize in the Sales, **24-Hour** Service, Rental, Planned Maintenance Agreements, Load Bank Testing, and Replacement Parts for Generator Sets and Automatic Transfer Switches.

Our Customer Base Encompasses a Wide Array of Industries: *from Healthcare, Education, Water Treatment and Wastewater Facilities, Federal, State and County Government Buildings, Military and Utility Installations, Police and Fire Departments, to Hospitality and Food Service Industries.* We Provide Sales and Service for Commercial/ Industrial Locations such as *Office Buildings and Manufacturing Plants*, as Well as an *Upscale Residential Market.*

SALES _

We are an Authorized, Full-Line **MTU** Distributor for Eastern and Central PA, Southern and Central NJ, and the Northern Delaware Areas. We can Provide Diesel-Fueled Generator Sets from 30 kW to 3.25 MW, and Natural Gas or LP-Fueled Generator Sets from 30 to 650 kW, along with a Full Complement of Accessories, Fuel Tanks and Housings.

Our Sales Department can also arrange for the Associated Automatic Transfer Switchgear as Supplied by ASCO, or GE Zenith Controls.

SERVICE _

Our First-Class Service Department Offers **24-Hour** Emergency Service and Repairs. We can Design a Planned Maintenance Agreement for your Equipment as Required by NFPA. To Test your Generator Set, we have Resistive Load Bank Capabilities to 2 MW and 480 Vac. We can also Provide Service for *Select Other Manufacturers* and Equipment.

RENTALS _

With A Fleet of Well-Maintained Generators from 22 Kw to 1 MW, along with **24-Hour** Service, we can provide for your Temporary Emergency or Prime Power Needs. We have Cutler-Hammer and ASCO Automatic Transfer Switches to 1600 Amps for your Emergency or Temporary Power Situations as Well.

PARTS _

We can assist with your Parts Requirements as we have a Well-Diversified Selection of Parts in Stock. We have the Associated Electrical and Mechanical Components such as: Remote Annunciators, Batteries, Battery Chargers, Circuit Breakers, Control Panels, Day-tanks, Engine Preheaters, Exhaust System Components, Load Banks, Outdoor Housings, Remote Radiators, and Voltage Regulators.

REMEMBER - For Reliable Power - Rely On: **Curtis Power Solutions,**

"THE EMERGENCY POWER SYSTEM SPECIALISTS"

2023-1-06



A Rolls-Royce
solution



POWER GENERATION SOLUTIONS BASED ON MORE THAN A CENTURY OF EXPERIENCE

The name Rolls-Royce is synonymous with premium quality – the best of the best. And MTU power generation systems from Rolls-Royce live up to that reputation with quality, reliability and lifecycle support that is trusted in mission-critical applications around the globe.

Industry legends such as Maybach, Daimler-Benz, Detroit Diesel, Katolight and Rolls-Royce are all integral parts of our heritage. MTU power generation systems reflect the great strength and innovation of these storied companies.

Rolls-Royce is one of the leaders in the power generation industry, with a comprehensive MTU power generation product portfolio and unmatched customer service. Our network of nearly 300 North American service locations ensures you're never far from an authorized distributor with a knowledgeable sales staff and EGSA-certified technicians to address all your power needs.

Complete power generation solutions

MTU power generation systems from Rolls-Royce are ideal for ensuring mission-critical standby and prime power in the most demanding commercial and industrial applications. As a single-source supplier, Rolls-Royce provides generator sets, automatic transfer switches, digital paralleling switchgear, fuel tanks and enclosures for complete onsite power solutions. With MTU engines powering gensets of 450 kW and above, Rolls-Royce delivers the benefits of vertical integration to its power generation customers.

Quality and compliance you can trust

MTU generator sets are compliant with many different codes and standards. Our validation philosophy and performance are regularly reviewed to ensure continuity with these codes and standards: UL2200, CSA, EPA, NFPA 99-Health Care Facilities, NFPA 70-National Electrical Code, NFPA 110 – Standard for Emergency and Standby Power Systems, Department of Labor and Industry, NEMA MG1-Motors and Generators, and MIL-STD-705-c.

Product portfolio

- Diesel-powered generator sets 30 kW to 3,250 kW
- Gas-powered generator sets 30 kW to 650 kW
- Natural gas cogeneration systems
- Automatic transfer switches 30 amps to 4,000 amps
- Paralleling switchgear and digital master control systems
- Demand response and load management programs
- Microgrids, battery storage and hybrid power systems

Features

- 50 Hz and 60 Hz models
- UL2200 listing available on most models
- Leading emissions technology
- Advanced monitoring and communications technology
- Digital engine controls and remote monitoring
- Proven reliability and durability
- Excellent transient response and one-step load acceptance
- 85 percent 24-hour average load factor
- IBC seismic certification and OSHPD approval available

Our history

- 1909** Karl and Wilhelm Maybach form Maybach Engines in Germany to power Zeppelin airships, eventually producing automobiles and off-highway engines.
- 1969** Maybach merges with the off-highway division of Daimler-Benz and MAN to form MTU, originally an acronym for “Motor and Turbine Union.”
- 1994** MTU and Detroit Diesel form a partnership to develop the Series 2000 and Series 4000 engine families.
- 2000** MTU merges with the off-highway operations of Detroit Diesel, under the name of MTU Detroit Diesel in the US.
- 2006** Tognum GmbH is formed as the parent company of MTU and MTU Detroit Diesel; the Tognum Group holding company is headquartered in Friedrichshafen, Germany.
- 2007** Tognum acquires Katolight Corporation, a generator set manufacturer and packager founded in 1952 and based in Mankato, Minnesota.
- 2008** MTU Onsite Energy is formed as the global power generation brand for Tognum, and Katolight Corporation is renamed MTU Onsite Energy Corporation.
- 2011** Daimler AG and Rolls-Royce Holdings PLC become majority shareholders of Tognum AG.
- 2014** Tognum is renamed to Rolls-Royce Power Systems
Rolls-Royce takes over 100 percent of Rolls-Royce Power Systems.
- 2019** Rolls-Royce aligns power generation under the MTU brand; MTU – A Rolls-Royce solution.
- 2020** Rolls-Royce Power Systems acquires Qinous, which becomes the Microgrid Competency Center and is renamed Rolls-Royce Solutions Berlin.
Rolls-Royce completes acquisition of Kinolt, an uninterruptible power supply provider, further expanding its portfolio as a complete solution provider for power generation.





Certificate of Compliance

Certificate: 1764878

Master Contract: 169106

Project: 80002494

Date Issued: 2019-08-15

Issued To: MTU Onsite Energy Corporation
100 Power Dr
Mankato, Minnesota, 56001
United States

Attention: Dan Gossman

The products listed below are eligible to bear the CSA Mark shown

Issued by: *Irfan Usmani*
Irfan Usmani



PRODUCTS

CLASS - C421501 - ELECTRIC GENERATING PLANTS

Electric generating sets, diesel fuel engine driven, Series D (with prefixes and suffixes), rated 2000kW max, 600V max, 60Hz, 1800 rpm, 1-ph with 1.0 PF rating and 3-ph with 0.8 PF rating, Class F or H, 40°C maximum ambient.

Electric generating sets, natural gas or LP fuel engine driven, Series L, N, NL, and V (with prefixes and suffixes), rated 650kW max, 600V max, 60Hz, 1800 rpm, 1-ph with 1.0 PF rating and 3-ph with 0.8 PF rating, Class F or H, 40°C maximum ambient.

APPLICABLE REQUIREMENTS

CSA C22.2 No. 100 – Motors and Generators
CSA C22.2 No. 14 – Industrial Control Equipment

CERTIFICATE OF COMPLIANCE

Certificate Number AU3559
Report Reference AU3559- 20020923
Issue Date 2019-DECEMBER-02

Issued to: MTU America Inc
100 Power Dr, Mankato MN 56001-4790

This certificate confirms that representative samples of ENGINE GENERATORS
See addendum Page

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 2200 Standard for Safety for Stationary Engine Generator Assemblies
Additional Information: See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



CERTIFICATE OF COMPLIANCE

Certificate Number AU3559
Report Reference AU3559- 20020923
Issue Date 2019-DECEMBER-02

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Stationary engine generator assemblies (diesel fueled) for outdoor use and Indoor Use, models as follows:

Model Series D followed by a number ranging from 250 to 3250, followed by F, followed by R,P,J,N or G, followed by X, followed by 4. May be followed by additional prefix or suffix letters or numbers.

Model Series D followed by a number ranging from 250 to 3250, followed by R,P,J,N or G, followed by X, followed by 6, Followed by T, followed by 2 or 3. May have additional prefix or suffix letters or numbers.

Model Series 220-3250, followed by R,P,J, N or G, followed by X, followed by C or S, followed by 6, followed by D, followed by T, followed by 2 or 3. May have additional prefix or suffix letters or numbers.

Model Series D, followed by S or P, may be followed by one or two zeroes, followed by a number ranging from 220 to 3250, followed by D, followed by 6, followed by C or S, followed by R, P, J, N or G, followed by A or W, followed by H, followed by 2, 4 or 5, followed by 48 or 57, followed by 3 or 4. May have additional prefix or suffix letters or numbers.

Models D, followed by G, followed by 12, 16, 18 or 20, followed by V, followed by 2000 or 4000. May have additional prefix or suffix letters or numbers.

Models 12, 16, 18 or 20, followed by V, followed by 2000 or 4000, followed by D, followed by S, followed by a number ranging from 650 to 3250. May have additional prefix or suffix letters or numbers.



Bruce Mahrenholz, Director North American Certification Program
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>





Power Generation

PERFORMANCE ASSURANCE CERTIFICATION



TESTING PROCEDURES

Prototype

We have been producing superior generator sets for more than six decades. Understanding the importance of reliable, cost-effective products, we have developed industry-leading test procedures to ensure we exceed this criteria. Our testing program confirms that our customers will receive products of the highest quality.

Our Performance Assurance Certification (PAC) certifies that every MTU generator set undergoes rigorous prototype testing including the following:

Prototype Test Procedures

- **Rated Load (NFPA 110)**
All generator set models will produce the nameplate-rated load within the design tolerance of the generator set.
- **Extended-run Testing**
All generator set prototypes have been subjected to extended run-time testing.
- **Transient Response Analysis (ISO 8528-5)**
All new generator set models have undergone transient response analysis per ISO 8528-5.
- **Torsional Analysis**
All generator set models have undergone torsional stress analysis.
- **Engine Cooling System**
All generator set models will cool sufficiently within the ambient design conditions per each model.
- **Anticipatory Alarms and Shutdowns**
The pre-alarms and alarms function appropriately to protect the generator set from any foreseen unnecessary failures.
- **Vibrational Analysis (ISO 8528-9)**
All new generator set models have undergone vibration analysis to ensure that each engine-generator coupling is balanced and that there is no destructive resonant vibration.
- **Noise Analysis (ISO 8528-10)**
All generator sets undergo airborne noise analysis using the enveloping surface method.

Prototype Test Standards

MTU generator sets are compliant with many different codes and standards. Our validation philosophy and performance are regularly reviewed to ensure continuity with these codes and standards:

UL2200, CSA, EPA, NFPA 99—Health Care Facilities, NFPA 70—National Electrical Code, NFPA 110—Standard for Emergency and Standby Power Systems, Department of Labor and Industry, NEMA MG 1—Motors and Generators, and MIL-STD-705-c.

Factory Acceptance

Our factory testing is performed with the same extreme diligence and attention to detail that is given to the prototype testing process. Every MTU generator set receives a complete factory acceptance test that certifies and ensures the system will function in accordance to every specific application.

Test metering has an accuracy of 1.3% or better. This metering is calibrated a minimum of once per year and is directly traceable to the Bureau of Standards.

Factory acceptance testing procedures

- **Insulation Resistance Inspection (301.1c)***
- **High Potential Test (302.1b)***
- **Alternator Overspeed (1 min.)***
- **Engine Inspection**
- **Generator Inspection**
- **Resistances Inspection (401.1b)**
 - Exciter Field Stator
 - Alternator Armatures
- **Mounting and Coupling Inspection**
- **Engine Fuel Oil System Inspection**
- **Engine Lube Oil System Inspection**
- **Engine Cooling System Inspection**
- **DC Charging System Inspection**
- **Circuit Breaker Inspection**
- **Anticipatory Alarms and Shutdowns Inspection (505.2b, 515.1b, 515.2b)**
- **Optional Equipment Inspection (513.2a)**
- **Load Test Inspection**
 - Full Nameplate-Rated Load
 - No-Load Inspection
 - MAX Load @ 1.0 P.F. (640.1d)
 - MAX Load @ 0.8 P.F.
 - Block Loads @ 0–25%, 0–50%, 0–75%, 0–100%
- **Phase Balance and Sequence Inspection (507.1d, 508.1d, 516.1a)**

** Performed by Alternator OEM*

OPTIONAL TESTING

Factory Acceptance

Extended-run factory acceptance testing

In some cases, extended-run testing may be requested. Unless specified otherwise, extended-run testing will be performed in the following manner:

- Full nameplate-rated load
- Standard readings taken every 15 or 30 minutes

Standard readings recorded during load test inspection

- Run Time
- AC Voltage
- AC Amperage
- kVA
- kWe
- Power Factor
- Frequency
- Exciter Field Voltage
- Exciter Field Current
- Lube Oil Pressure
- Engine Coolant Temperature
- Ambient Temperature

Witnessed factory acceptance testing

Witnessed factory tests must be scheduled and approved at least four weeks prior to the generator set's scheduled shipping date. Any requests for witnessed factory testing after this four-week period must be approved by the Regional Sales Manager and are subject to additional fees.

Witnessed extended-run factory acceptance testing

Witnessed extended-run tests must be scheduled and approved at least four weeks prior to the generator set's scheduled ship date. Any requests for witnessed extended-run testing after this four-week period must be approved by the Regional Sales Manager and are subject to additional fees.

Additional factory acceptance testing

Additional testing is available upon request. The following is a list of supplementary tests which can be performed on MTU generator sets. Non-standard testing is subject to additional charges.

Additional testing procedures

- Start and Stop Test (MIL-STD-705c 503.1c)
- Remote Start and Stop Test (MIL-STD-705c 503.2c)
- Overspeed Protective Device Test (MIL-STD-705c 505.2b)
- Insulation Resistance Test (MIL-STD-705c 301.1c)*
- Open Circuit Saturation Curve Test (MIL-STD-705c 410.1b)
- Temperature Rise Test (MIL-STD-705c 680.1c)
- Frequency Range Adjust Test (MIL-STD-705c 511.2c)
- Low Oil Pressure Protective Device Test (MIL-STD-705c 515.1b)
- Over-temperature Protective Device Test (MIL-STD-705c 515.2b)
- Controls, Direction, and Rotation Test (MIL-STD-705c 516.1a)
- Frequency and Voltage Regulation, Stability, and Transient Response (MIL-STD-705c 608.1b)
- Voltage and Frequency Regulation (MIL-STD-705c 614.1b)
- Voltage Dip and Rise for Rated Load Test (MIL-STD-705c 619.2c)
- Regulator Range Test (511.1d)
- Maximum Power Test (MIL-STD-705c 640.1d)
- Fuel Consumption Test
- Vibration and Mechanical Balance Test (ISO 8528-9)
- Sound Test (ISO 8528-10)

* Testing conducted by generator OEM



JOHN DEERE EMISSION TEST DATA 6135HFG84 460kW@1800rpm*

ENGINE SPEED - RPM	1800	1800	1800	1800	1800
EXH ELBOW - C	526.7	510.6	508.3	448.3	269.4
OBSV TORQUE - Nm	2435	1835	1218	615	241
OBSV BRAKE POWER - kW	458.8	345.5	229.4	115.8	45.3
CBM CO2 - kg/h	301.9	244.8	173.2	90.8	40.4
CBM CO2 - g/kWh	658	709	755	784	891
CBM CO - g/h	313.4	381.1	248.2	411.6	253.4
CBM CO - g/kWh	0.68	1.10	1.08	3.55	5.59
CBM HC - g/h	29.0	38.7	34.0	39.0	57.9
CBM HC - g/kWh	0.06	0.11	0.15	0.34	1.28
CBM NOX - g/h	2321	1209	632	453	293
CBM NOX - g/kWh	5.06	3.50	2.75	3.91	6.47
CBM NOX+HC - g/h	2350	1248	666	492	351
CBM NOX+HC - g/kWh	5.1	3.6	2.9	4.3	7.8
PM CBM TOTAL - g/h	16.18	40.37	29.93	19.96	8.76
PM CBM TOTAL - g/kWh	0.035	0.117	0.130	0.172	0.193

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

This information is property of Deere & Company. It is provided solely for the purpose of obtaining certification or permits of Deere powered equipment. Unauthorized distribution of this information is prohibited.

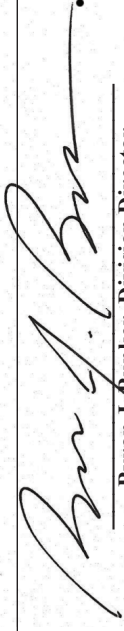


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

**OFFICE OF TRANSPORTATION
 AND AIR QUALITY
 ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Deere & Company
 (U.S. Manufacturer or Importer)
Certificate Number: PJDXXL13.5146-007

Effective Date:
 06/16/2022
Expiration Date:
 12/31/2023


 Byron J. Bunker, Division Director
 Compliance Division

Issue Date:
 06/16/2022
Revision Date:
 N/A

Model Year: 2023
Manufacturer Type: Original Engine Manufacturer
Engine Family: PJDXXL13.5146

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 450<=kW<=560
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Non-standard Non-After Treatment Device Installed, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.



VMC GROUP
THE POWER OF TOGETHER™



A Rolls-Royce
solution

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS



Certification No.

VMA-52617-01C (Revision 5)

Expiration Date: 7/31/2025

Certification Parameters:

The nonstructural products (mechanical and/or electrical components) listed on this certificate are CERTIFIED¹ FOR SEISMIC APPLICATIONS in accordance with the following building code² releases.

IBC 2021, 2018, 2015, 2012, 2009

The following model designations, options, and accessories are included in this certification. Reference report number VMA-52617-01 as issued by VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

**Rolls-Royce Solutions America Inc.; Diesel Gensets
Tier 3 and Tier 4 Gensets; 210kW - 400kW**

The above referenced equipment is APPROVED for seismic application when properly installed³, used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance⁴. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as $I_p=1.5$. The equipment is qualified by successful seismic shake table testing at the nationally recognized University of California Berkeley Pacific Earthquake Engineering Research Center under the witness of the ISO Accredited Product Certification Agency, the VMC Group.

Certified Seismic Design Levels			
Certified IBC	Importance $I_p \leq 1.5$ Soil Classes A-E Risk Categories I-IV Design Categories A-F	z/h ≤ 1.0	z/h = 0.0
		$S_{DS} \leq 2.500\text{ g}$	$S_{DS} \leq 2.500\text{ g}$

Certified Seismic Installation Methods	
Rigid Mounting From Unit Base To Rigid Structure	External Isolation Mounting From Unit Base To Rigid Structure
Rigid Mounting From Unit Base To Fuel Tank	External Isolation Mounting From Unit Base To Fuel Tank

HEADQUARTERS
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Toll Free: 800.569.8423
Fax: 973.492.8430

CALIFORNIA
180 Promenade Circle
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Phone: 916.634.7771

TEXAS
11930 Brittmoore Park Drive
Houston, TX 77041
Phone: 713.466.0003
Fax: 713.466.1355

thevmcgroup.com





CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

Model	Rating [kW]	EPA Rating	Configuration	Max Length [in.]	Max Width [in.]	Max Height [in.]	Max Weight [in.]
<i>mtu</i> 6R0150 DS210 <i>mtu</i> 6R0150 DS230 <i>mtu</i> 6R0150 DS250 <i>mtu</i> 6R0150 DS275 <i>mtu</i> 6R0150 DS300	210-300	Tier 3/4	Open Off Tank	144	60	98	8,500
			Enclosed Off Tank	190		104	11,000
			Open On Tank	320		134	25,000
			Enclosed On Tank			140	28,500
<i>mtu</i> 6R0225 DS275 <i>mtu</i> 6R0225 DS300 <i>mtu</i> 6R0225 DS325 <i>mtu</i> 6R0225 DS350 <i>mtu</i> 6R0225 DS365 <i>mtu</i> 6R0225 DS400	275-400		Open Off Tank	155	88	105	11,000
			Enclosed Off Tank	207		111	14,000
			Open On Tank	287		141	30,000
			Enclosed On Tank			147	36,000

Notes:

- 1) Dimensional data does not include spring isolator height
- 2) Weight includes enclosure and fuel where applicable

Mounting	Type	S _{DS} (z/h=0)	S _{DS} (z/h=1)	A _{Flex-H}	A _{Rig-H}	A _{Flex-V}	A _{Rig-V}	F _p /W _p
Rigid	AC156	2.50	2.50	3.20	3.00	1.68	0.68	1.88
Isolated								5.63

This certification includes the open generator set and the enclosed generator set when installed with or without the sub-base tank. This certification also includes the sub-base tank as a stand-alone accessory. The generator set and included options shall be a catalogue design and factory supplied. The generator set and applicable options shall be installed and attached to the building structure per the manufacturer supplied seismic installation instructions. For a list of certified configurations and options please directly contact the manufacturer. This certification excludes all non-factory supplied accessories, including but not limited to mufflers, isolation/restraint devices, remote control panels, remote radiators, pumps and other electrical/mechanical components.



VMA-52617-01C (Revision 5)
 Issue Date: Wednesday, April 24, 2019
 Revision Date: Tuesday, June 21, 2022
 Expiration Date: Thursday, July 31, 2025



CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Notes & Comments:

1. All equipment listed herein successfully passed the seismic acceptance criteria for shake testing non-structural components and systems as set forth in the ICC AC-156. The Test Response Spectrum (TRS) enveloped the Required Response Spectrum (RRS) for all units tested. The tested units were representative sample(s) of a contingent of models and all remained captive and structurally sound after the seismic shake simulation. The units also remained functionally operational after the simulation testing as functional testing was completed by the equipment manufacturer before and after the seismic simulations. Although a seismic qualified unit inherently contains some wind resisting capacity, that capacity is undetermined and is excluded from this certification. Snow/Ice loads have been neglected and thus limit the unit to be installed both indoors (covered by an independent protective structure) and out of doors (exposed to accumulating snow/ice) for ground snow loads no greater than 30 psf for all applications.
2. The following building codes are addressed under this certification:
 - IBC 2021 referencing ASCE7-16 and ICC-ES AC-156
 - IBC 2018 referencing ASCE7-16 and ICC-ES AC-156
 - IBC 2015 referencing ASCE7-10 and ICC-ES AC-156
 - IBC 2012 referencing ASCE7-10 and ICC-ES AC-156
 - IBC 2009 referencing ASCE7-05 and ICC-ES AC-156
3. Refer to the manufacturer supplied installation drawings for anchor requirements and mounting considerations for seismic applications. Required anchor locations, size, style, and load capacities (tension and shear) may be specified on the installation drawings or specified by a 3rd party. Mounting requirement details such as anchor brand, type, embedment depth, edge spacing, anchor-to-anchor spacing, concrete strength, special inspection, wall design, and attachment to non-building structures must be outlined and approved by the Engineer of Record for the project or building. Structural walls, structural floors, and housekeeping pads must also be seismically designed and approved by the project or building Structural Engineer of Record to withstand the seismic anchor loads as defined on the installation drawings. The installing contractor is responsible for ensuring the proper installation of all anchors and mounting hardware.
4. For this certificate and certification to remain valid, this certificate must correspond to the "Seismic Certification Label" found affixed to the unit by the factory. The label ensures the manufacturer built the unit in conformance to the IBC seismic design criteria set forth by the Certified Seismic Qualification Agency, the VMC Group, and meets the seismic design levels claimed by this certificate.
5. Mechanical, Electrical, and Plumbing connections to the equipment must be flexibly attached as to not transfer load through the connection. The structural integrity of any conduit, cable trays, piping, ductwork and/or flexible connections is the responsibility of others. This certification does not guarantee the equipment will remain compliant to NEMA, IP, UL, or CSA standards after a seismic event.
6. This certificate applies to units manufactured at:
100 Power Drive, Mankato, MN 56001
7. This certification follows the VMC Group's ISO-17065 Scheme.

John P. Giuliano, PE
President, VMC Group



VMA-52617-01C (Revision 5)
Issue Date: Wednesday, April 24, 2019
Revision Date: Tuesday, June 21, 2022
Expiration Date: Thursday, July 31, 2025



Limited Warranty

Series 150, 200, 300 and 4000 Power Transfer Switches

This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser's business.

General

ASCO Power Technologies, LP products and systems are in our opinion the finest available. We take pride in our products and are pleased that you have chosen them. Under certain circumstances we offer with our products the following Limited Guardian Warranty Against Defects in Material and Workmanship.

Please read your Guardian Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

Limited Warranty Against Defects in Material and Workmanship:

Product Description	Series	Catalog Code
Automatic Transfer Switch	150, 200	1ATS, 2ATS
	300	3ATS, 3ADTS
	4000	4ATS, 4ADTS, 4ACTS
Non-Automatic Transfer Switch (Electrically Operated)	300	3NTS, 3NDTS
ASCO Lighting Control Panels	4000	4NTS, 4NDTS, 4NCTS
Manual Transfer Switch	300	3MTS, 3MTQ, 3MUQ, 3MPQ, 3MGQ, 3MGDQ, 3MTDQ
Service Entrance Transfer Switch (SEATS)	300	3AUS, 3ADUS, 3APS, 3ARS, 3MUS
Power Transfer Load Center (PTLC)	300	300L
Quick Connect Panels	300	3QCN, 3QCU, 3QCD
Electrically Operated Bypass Switch	4000	4ATE, 4NTE, 4ADTE, 4NDTE

Limited Warranty

ASCO warrants that the ATS will be free from defects in material and workmanship and will conform to ASCO's standard specifications for the ATS for a period of twenty four (24) months from date of product shipment from ASCO (the "Warranty Period"). This Limited Warranty does not extend to subsequent owners of the structure during the Warranty period.

Terms of Warranty

The foregoing Limited Warranty is conditioned upon user's compliance with the following:

1. The ASCO Power Transfer Switch is installed in accordance with ASCO specifications and state and local codes and standards by an electrician licensed in the state of installation.
2. The ASCO Power Transfer Switch is maintained in accordance with ASCO instructions and used under normal conditions for the purposes intended by ASCO.

All warranty field-related repairs, replacements or adjustments must be made by ASCO Services Inc. or its duly authorized representative.

Optional Available Extended Warranty

Optional extended warranty coverage may be purchased from ASCO for a specified fee at the time of the original sale. If purchased, Warranty period shall be extended up to an additional thirty - six (36) months beyond the standard twenty - four (24) months to provide up to five (5) year coverage applicable to the above referenced products, except for 3AUS, 3APS, and 3ARS products where the warranty period for the circuit breaker shall be limited to 24 months from date of shipment from ASCO. The length of optional extended coverage shall be reflected on the ASCO invoice and/or order acknowledgement document.

**Warranty Extends
To First Purchaser
for Use,
Non-Transferable**

This Warranty is extended to the first person, firm, association, or corporation for whom the ASCO product specified herein is originally installed for use (the "user") in the fifty United States or Canada. This Warranty is not transferable or assignable without the prior written permission of ASCO.

**Assignment of
Warranties**

ASCO assigns to user any warranties which are made by manufacturers and suppliers of components of, or accessories to, the ASCO product and which are assignable, but ASCO makes no representations as to the effectiveness or extent of such warranties, assumes no responsibility for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components or accessories.

**Drawings,
Descriptions**

ASCO warrants for the period and on the terms of the Warranty set forth herein that the ASCO product will conform to the descriptions contained in the certified drawings, if any, applicable thereto, to ASCO's final invoices, and to applicable ASCO product brochures and manuals current as of the date of product shipment ("descriptions"). ASCO does not control the use of any ASCO product. Accordingly, it is understood that the descriptions are not Warranties of performance and not Warranties of fitness for a particular purpose.

**Warranty Claims
Procedure**

Within a reasonable time, but in no case to exceed thirty (30) days, after user's discovery of a defect, user shall contact ascopowerwarranty@ascopower.com. Subject to the limitations specified herein, an ASCO Services field service representative will repair the non-conforming ASCO product warranted hereunder, without charge for parts, labor, or travel expenses. Warranty coverage will apply only after ASCO's inspection discloses the claimed defect and shows no signs of treatment or use that would void the coverage of this Warranty . All defective products and component parts replaced under this Warranty become the property of ASCO.

**Warranty
Performance of
Component
Manufacturers**

It is ASCO's practice, consistent with its desire to remedy Warranty defects in the most prompt and effective manner possible, to cooperate with and utilize the services of component manufacturers and their authorized representatives in the performance of work to correct defects in the product components. Accordingly, ASCO may utilize third parties in the performance of Warranty work, including repair or replacement hereunder, where, in ASCO's opinion, such work can be performed in less time, with less expense, or in closer proximity to the ASCO product.

**Items Not Covered
By Warranty**

This Warranty does not cover damage or defect caused by misuse, improper application, wrong or inadequate electrical current or connection, negligence, inappropriate on site operating conditions, repair by non-ASCO designated personnel, accident in transit, tampering, alterations, a change in location or operating use, exposure to the elements, water, or other corrosive liquids or gases, acts of God, theft or installation contrary to ASCO's recommendations or specifications, or in any event if the ASCO serial number has been altered, defaced, or removed.

This Warranty does not cover shipping costs, installation costs, external circuit breaker resetting or maintenance or service items and further, except as may be provided herein, does not include labor costs or transportation charges arising from the replacement of the ASCO product or any part thereof or charges to remove or reinstall same at any premises of user.

Repair or replacement of a defective product or part thereof does not extend the original Warranty period.

The products listed in this Warranty are not for use in the control area or any reactor connected or safety applications or within the containment area of a nuclear facility or for integration into medical devices.

Limitations

This Warranty is in lieu of and excludes all other Warranties, express or implied, including merchantability and fitness for a particular purpose.

User's sole and exclusive remedy is repair or replacement of the ASCO product as set forth herein.

If user's remedy is deemed to fail of its essential purpose by a court of competent jurisdiction, ASCO's responsibility for property loss or damage shall not exceed the net product purchase price.

In no event shall ASCO assume any liability for indirect, special, incidental, consequential or exemplary damages of any kind whatsoever, including without limitation lost profits, business interruption or loss of data, whether any claim is based upon theories of contract, negligence, strict liability, tort, or otherwise.

Miscellaneous

No salesperson, employee, or agent of ASCO is authorized to add to or vary the terms of this Warranty. Warranty terms may be modified, if at all, only in writing signed by an ASCO officer.

ASCO obligations under this Warranty are conditioned upon ASCO timely receipt of full payment of the product purchase price and any other amounts due. ASCO reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to user or others.

In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the Warranty period, the remaining terms and provisions shall continue in full force and effect.

This Warranty shall be governed by, and construed under, the laws of the State of New Jersey, without reference to the conflict of laws principles thereof.

This Warranty represents the entire agreement between ASCO and user with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings, or agreements relating to this subject.



MTU AMERICA INC.

Two (2) Year / 3,000 Hour Basic Limited Warranty
Standby (3D) / Prime (3B) / Data Center Continuous Power (3F)

MTU America Inc. issues the following express Limited Warranty subject to the following terms, conditions, and limitations:

An original consumer ("Owner") who purchases an MTU engine generator set ("Product") is entitled to coverage under this Limited Warranty. MTU America Inc. warrants to the Owner that the Product is free of defects in material and workmanship and will perform under normal use and service from valid start-up performed by MTU America Inc. Any nonconformity to the foregoing is defined as a Warrantable Defect. This Limited Warranty applies to Product shipped by MTU America Inc. after January 1, 2014.

1. Limited Warranty Periods

Limited Warranty Period. The Limited Warranty Period for a Warrantable Defect in the Product is twenty-four (24) months after the first commissioning of the Product. In all cases, the Limited Warranty period will expire not later than thirty-six (36) months from the date of shipment from the MTU America Inc. Mankato, MN facility or after 3,000 operation hours, whichever occurs first.

Accessories Coverage Period. The Accessories Coverage Period for a Warrantable Defect in cords, receptacles, cord reels, gas flex pipes, housing lights, space heaters, and associated equipment ("Accessories") is twelve (12) months from the date of shipment from MTU America Inc. Mankato, MN facility.

MTU America Inc. warranty obligations under this Limited Warranty are contingent upon distributor completing the following:

- (a) The MTU America Inc. warranty and the *Start-Up Validation and Pre-Inspection Form*. Return both to MTU America Inc. within sixty (60) days of the start-up date; and
- (b) The engine registration form (when applicable). Return to the manufacturer as stated in the engine registration form instructions.

2. MTU America Inc. Responsibilities

If a Warrantable Defect is found during the Limited Warranty Period and/or the Accessories Coverage Period, and provided the Owner has complied with its obligations under Section 3, MTU America Inc. will, during normal working hours, through an MTU authorized distributor, dealer, or service outlet, perform some or all of the following:

- (a) Repair or replace, at the sole election of MTU America Inc., the defective part with a new or remanufactured replacement part;
- (b) Provide reasonable or customary labor needed to correct the Warrantable Defect;
- (c) Provide technician travel time of 400 miles to and from the closest MTU authorized distributor, dealer, or service outlet to the Product location;
- (d) Part removal and re-installation, if necessary and as solely determined by MTU America Inc.

The obligation to repair or replace defective parts by MTU America Inc. does not include responsibility for reimbursement of incidental or consequential costs. If MTU America Inc. repairs or replaces an Accessory, part, or Product under this Limited Warranty, the repaired or replaced Accessory, part, or Product assumes the unexpired portion of the warranty period remaining from the original Accessory, part, or Product. Repair or replacement of an Accessory, part, or Product will not extend the term of the original Limited Warranty Period or Accessories Coverage Period. Parts or Product replaced shall become the property of MTU America Inc.

MTU America Inc. Two (2) Year / 3,000 Hour Basic Standby Limited Warranty Standby (3D) / Prime (3B) / Data Center Continuous Power (3F)

Failure of MTU America Inc. to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.

3. Owner Responsibilities

During the Limited Warranty Period and Accessories Coverage Period, the Owner is responsible for, and MTU America Inc. will not reimburse for the following:

- (a) Battery;
- (b) Premium or overtime labor costs;
- (c) Labor and material costs for Product removal and reinstallation;
- (d) Any special access fees required to gain access to MTU equipment, without limitation, training or safety policy requirement to gain access;
- (e) Transportation costs or travel expenses related to delivery of the Product to the designated distributor, dealer, or service outlet;
- (f) Incidental and consequential costs, damages, or administrative expenses of whatever nature;
- (g) Non-Product repairs, vehicle damage, "downtime" expenses, cargo damage, fines, lost income, any business costs of any kind, Owner's travel expenses, and other losses resulting from a Warrantable Defect;
- (h) Shipping charges for replacement parts/Products in excess of those which are usual and customary; or
- (i) Local taxes, if applicable.

In addition, Owner must:

- (a) Operate, use, and maintain the Product in accordance with the applicable Owner's manual and/or any other manuals specified by MTU America Inc., including without limitation handling, inspection, servicing, or operating instructions;
- (b) Promptly notify MTU America Inc. or its authorized representative of a Warrantable Defect and make the Product available for repair;
- (c) Comply with MTU America Inc. or its authorized representative's reasonable directions regarding the timing, sequence, and location of warranty repairs and make the Product available for inspection;
- (d) Perform all required maintenance and maintain and provide proof that all required maintenance has been performed;
- (e) Use MTU specified parts, components, and consumables;
- (f) Promptly return to MTU America Inc. all parts replaced under this Limited Warranty;
- (g) Comply with MTU America Inc. long term storage guidelines, if applicable, and maintain and provide proof of compliance;
- (h) Routinely exercise the Product in accordance with operating instructions;
- (i) Install the Product in accordance with the installation guide provided; and
- (j) Reimburse MTU America Inc. for all costs incurred in providing warranty service where, following examination, the request or claim for warranty coverage proves to be unfounded or excluded, as well as all incidental costs including those incurred investigating the claim.

4. Limitations

MTU America Inc. is not responsible, and this Limited Warranty is not available under any circumstances, for any of the following:

- (a) Failure of Owner to fulfill its obligations under Section 3;
- (b) Failure of Owner to follow MTU America Inc. instructions for Product stored by Owner longer than 180 days from date of shipment from the MTU America Inc. Mankato, MN facility;
- (c) Defects caused by adjustments made by Owner to the fuel system or governor system;

MTU America Inc. Two (2) Year / 3,000 Hour Basic Standby Limited Warranty Standby (3D) / Prime (3B) / Data Center Continuous Power (3F)

- (d) Defects which were obvious or capable of being identified by reasonable inspection and were not reported to MTU America Inc. within a reasonable time;
- (e) Rental equipment used during warranty work;
- (f) Defects caused or potentially caused by service work performed by non-MTU authorized service providers and/or the use of non-genuine MTU parts;
- (g) Defects resulting from natural wear and tear, external action, negligence, natural disasters, accidents, incorrect use, improper handling or storage, inadequate corrosion-proofing, incorrect assembly or installation, or modification of the Product;
- (h) Defects resulting from abuse or neglect, including unauthorized modifications to the Product;
- (i) Repair or any use or installation which MTU America Inc., in its sole discretion, determines to be improper;
- (j) Defects caused by incorrect maintenance;
- (k) Defects resulting from Owner's delay in making the Product available after being notified of a potential problem or Owner's failure to take immediate measures to avoid or mitigate damage;
- (l) Damage caused by shipping;
- (m) Repair of parts sold by MTU America Inc. that are warranted directly to the Owner by the respective part's manufacturer;
- (n) Misapplication of the Product;
- (o) Diesel engine "wet stacking" due to lightly loaded diesel engines;
- (p) Acts of nature or acts of God;
- (q) Any failure, other than those resulting from a defect in material or factory workmanship of the Product;
- (r) Use of the Product for purposes other than those for which it was intended, including without limitation use of the Product under extraordinary operating conditions not made known to MTU America Inc. in writing at the time of the order; or
- (s) Material provided by or a design specified by the Owner.

5. Software Warranty. Where software is included in the Product, MTU America Inc. warrants to the Owner that 1) the software will be substantially free from material program errors and material defects in material and workmanship, and that 2) it shall function substantially in accordance with MTU America Inc. specification at the time of dispatch from the MTU America Inc. manufacturing facility. MTU America Inc. does not warrant that the software is error-free or free from "bugs" as commonly categorized by the computer industry. MTU America Inc. shall, during the Limited Warranty Period, endeavor to remedy at its cost, in its sole discretion, by repair or replacement of any material program errors or material defects of which Owner has promptly notified MTU America Inc. MTU America Inc., at its option, may elect to provide the most current software at no cost, and in such case MTU America Inc. will not cover the cost to install the applicable updated software. MTU America Inc. shall have no obligation with respect to any nonconformities resulting from unauthorized modifications to the software or any Owner interfacing.

6. Emissions Warranty. The Product may be covered under an emissions warranty specified by the U.S. Environmental Protection Agency and/or the California Air Resources Board. The terms of the warranty, if applicable, may be accessed by following the link: <https://www.mtu-solutions.com/eu/en/technical-information/emissions-warranty.html>. Any such Emissions Warranty is incorporated herein by reference in its entirety to the extent and with the same force as if fully set forth herein. The Product, if certified, may only be certified to comply with the required country or region-specific emission regulations. Where applicable, the Product is only certified to those specific emission regulations/standards which are clearly stated in the respective MTU America Inc. defined technical specifications. IT IS THE OWNER'S SOLE RESPONSIBILITY TO ENSURE THAT THE EXPORT/IMPORT, INSTALLATION, AND USE OF THE PRODUCT(S) COMPLIES WITH THE APPLICABLE EMISSION REGULATIONS IN THE COUNTRY OR REGION WHERE THE PRODUCT(S) WILL BE USED.

MTU America Inc. Two (2) Year / 3,000 Hour Basic Standby Limited Warranty Standby (3D) / Prime (3B) / Data Center Continuous Power (3F)

7. Disclaimers

LIMITATION OF WARRANTIES: THIS LIMITED WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, FREEDOM FROM INFRINGEMENT OR THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.

THIS LIMITED WARRANTY, THE OBLIGATIONS OF MTU AND THE RIGHTS AND REMEDIES OF THE OWNER SET FORTH IN THIS LIMITED WARRANTY ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF, AND THE OWNER HEREBY WAIVES AND RELEASES ALL OTHER OBLIGATIONS, WARRANTIES (INCLUDING WARRANTY AGAINST REDHIBITORY DEFECTS), REPRESENTATIONS OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW IN CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY CLAIMS ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE PERFORMANCE OF THIS LIMITED WARRANTY OR FROM THE DESIGN, MANUFACTURE, SALE, REPAIR, LEASE OR USE OF THE PRODUCT, ANY COMPONENT THEREOF AND SERVICES DELIVERED OR RENDERED HEREUNDER OR OTHERWISE.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, ALLEGED NEGLIGENCE, OR OTHERWISE, SHALL MTU BE SUBJECT TO LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING WITHOUT LIMITATION, DAMAGE TO THE PRODUCT, OR OTHER PROPERTY, COMMERCIAL LOSSES, LOST PROFITS, LOSS OF USE, INCONVENIENCE, LOSS OF TIME, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, DOWNTIME, OR CLAIMS OF CUSTOMERS.

MTU AMERICA INC. SHALL NOT BE LIABLE FOR ANY CLAIM GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT.

8. The Owner is entitled to rectify the defect or to have it rectified by third parties only in urgent cases where operational safety is at risk or in order to prevent disproportionately extensive damage; provided that Owner has informed MTU America Inc. and obtained prior written consent from MTU America Inc. In such cases, MTU America Inc. shall, in its sole discretion, reimburse the costs incurred by the Owner up to an amount equivalent to the costs MTU America Inc. would have incurred had it remedied the defect itself.
9. This Limited Warranty gives the Owner specific legal rights, and the Owner may also have other rights, which vary from state to state. Some states do not allow warranty duration limitations and/or certain exclusions or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion(s) may not apply to Owner. If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal, or unenforceable in any respect, the validity, legality, or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.
10. This Limited Warranty is governed by the laws of the State of Minnesota without regard to its conflicts of law principles and excluding the United Nations Convention for the International Sale of Goods.
11. In order to obtain performance of an MTU America Inc. warranty obligation, the Owner should contact the nearest MTU authorized distributor, dealer, or service outlet for instructions. To find the location of the nearest MTU authorized distributor, dealer, or service outlet call +1 248-560-8000 or write to: MTU America Inc. Warranty Department, 39525 MacKenzie Drive, Novi, MI 48377.



Diesel Generator Set

mtu 6R0225 DS400

400 kWe/60 Hz/Standby/208 - 600V



System ratings

Voltage (L-L)	208V	240V	380V	480V	600V
Phase	3	3	3	3	3
PF	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
kW	400	400	400	400	400
kVA	500	500	500	500	500
Amps	1,388	1,203	760	601	481
skVA@30% voltage dip	1,119	959	934	1,277	1,100
Generator model	572RSL4025	433CSL6220	572RSL4025	433CSL6220	433PSL6248
Temp rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

Certifications and standards

- Emissions
 - EPA Tier 3 certified
 - South Coast Air Quality Management District (SCAQMD)
- Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- Seismic certification - optional
 - 2021 IBC certification
 - HCAI pre-approval
- UL 2200 - optional
- CSA - optional
 - CSA C22.2 No. 100
 - CSA C22.2 No. 14
- Performance Assurance Certification (PAC)
 - Generator set tested to ISO 8528-5 for transient response
 - Verified product design, quality and performance integrity
 - All engine systems are prototype and factory tested
- Power rating
 - Accepts rated load in one step per NFPA 110
 - Permissible average power output during 24 hours of operation is approved up to 75%.

Standard features*

- Single source supplier
- Global product support
- Two (2) Year/3,000 Hour Basic Limited Warranty
- 6135HFG84 diesel engine
 - 13.5 liter displacement
 - Common rail fuel injection
 - 4-cycle
- HVO and GtL fuels meeting fuel specification EN15940
- Engine-generator resilient mounted
- Complete range of accessories
- Cooling system
 - Integral set-mounted
 - Engine-driven fan
- Generator
 - Brushless, rotating field generator
 - 2/3 pitch windings
 - 300% short circuit capability with Permanent Magnet Generator (PMG)
 - ◊ PMG standard for 570 frame and larger
 - ◊ PMG optional for 430 frame and smaller
- Digital control panel(s)
 - UL recognized, CSA certified, NFPA 110
 - Complete system metering
 - LCD display

Standard equipment*

Engine

- Air cleaner
- Oil pump
- Oil drain extension and shut-off valve
- Full flow oil filter
- Open crankcase ventilation
- Jacket water pump
- Thermostat
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 24V
- Governor - electronic isochronous
- Base - formed steel
- SAE flywheel and bell housing
- Charging alternator - 24V
- Battery rack and cables
- Flexible fuel connectors
- Flexible exhaust connection
- EPA certified engine

Generator

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds
- Self-ventilated and drip-proof
- Superior voltage waveform
- Digital, solid state, volts-per-hertz regulator
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 130 °C maximum standby temperature rise
- 1-bearing, sealed
- Flexible coupling
- Full amortisseur windings
- 125% rotor balancing
- 3-phase voltage sensing
- $\pm 0.25\%$ voltage regulation (570 frame) no load to full load
- $\pm 1\%$ voltage regulation (430 frame) no load to full load
- 100% of rated load - one step
- 5% maximum total harmonic distortion

Digital control panel(s)

- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- CANBus ECU communications
- Windows®-based software
- Multilingual capability
- Communications to remote annunciator
- Programmable input and output contacts
- UL recognized, CSA certified, CE approved
- Event recording
- IP 54 front panel rating with integrated gasket
- NFPA 110 compatible

Application data

Engine

Manufacturer	John Deere
Model	6135HFG84
Type	4-cycle
Arrangement	6-inline
Displacement: L (in ³)	13.5 (824)
Bore: cm (in)	13.2 (5.2)
Stroke: cm (in)	16.5 (6.5)
Compression ratio	16:1
Rated rpm	1,800
Engine governor	JDEC
Maximum power: kWm (bhp)	460 (617)
Steady state frequency band	± 0.25%
Air cleaner	dry

Liquid capacity

Total oil system: L (gal)	40 (10.57)
Engine jacket water capacity: L (gal)	18 (4.76)
System coolant capacity: L (gal)	47.7 (12.6)

Electrical

Electric volts DC	24
Cold cranking amps under -17.8 °C (0 °F)	950
Batteries: group size	31
Batteries: quantity	2

Fuel system

Fuel supply connection size	-10 JIC 37° female
Fuel return Connection size	-6 JIC 37° female
Maximum fuel Lift: m (ft)	2.4 (8)
Recommended fuel	diesel #2/HVO
Total fuel flow: L/hr (gal/hr)	190 (50)

Fuel consumption

At 100% of power rating: L/hr (gal/hr)	110 (29)
At 75% of power rating: L/hr (gal/hr)	91 (24)
At 50% of power rating: L/hr (gal/hr)	63 (17)

Cooling - radiator system

Ambient capacity of radiator: °C (°F)	50 (122)
Maximum restriction of cooling air: intake and discharge side of radiator: kPa (in. H ₂ O)	0.124 (0.5)
Water pump capacity: L/min (gpm)	400 (106)
Heat rejection to coolant: kW (BTUM)	208 (11,839)
Heat rejection to air to air: kW (BTUM)	94 (5,350)
Heat radiated to ambient: kW (BTUM)	48.1 (2,735)
Fan power: kW (hp)	24 (32.2)

Air requirements

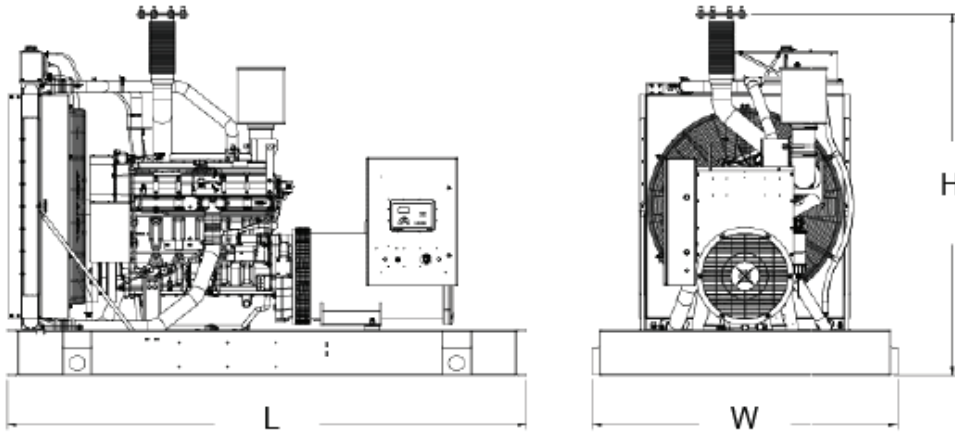
Aspirating: *m ³ /min (SCFM)	28.2 (996)
Air flow required for radiator cooled unit: *m ³ /min (SCFM)	833 (29,433)
Remote cooled applications; air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise: *m ³ /min (SCFM)	164.4 (5,842)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

Exhaust system

Gas temperature (stack): °C (°F)	527 (981)
Gas volume at stack temperature: m ³ /min (CFM)	73.8 (2,606)
Maximum allowable back pressure at outlet of engine, before piping: kPa (in. H ₂ O)	7.5 (30)

Weights and dimensions



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight
Open Power Unit (OPU)	3,180 x 2,045 x 2,110 mm (125.2 x 80.5 x 83.1 in)	3,161 4,105 kg (7,037 9,050 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Sound data

Unit type	Standby full load
Level 0 (OPU): dB(A)	89.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

Emissions data

NO _x + NMHC	CO	PM
3.8	0.51	0.03

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values). Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA standards.

Rating definitions and conditions

- Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514, and AS 2789. Average load factor: ≤ 75%.
- Nominal ratings at standard conditions: 25 °C and 300 meters (77 °F and 1,000 feet).
- Deration factor:
 - Consult your local **mtu** Distributor for altitude derations.
 - Consult your local **mtu** Distributor for temperature derations.

marathon™ Generators

TYPICAL SUBMITTAL DATA

MODEL: 433PSL6220

Winding: 1909

Prepared by: Mark Bartz

Date: 02/27/17

Kilowatt ratings at	1800 RPM	60 Hertz	12 LEADS		
kW (kVA)	3 Phase	0.8 Power Factor		Dripproof or Open Enclosure	
	CONTINUOUS ^{① ②}			STANDBY ^{① ②}	
Voltage*	NEMA B / 80 °C	NEMA F / 105 °C	NEMA H / 125 °C	NEMA F / 130 °C	NEMA H / 150 °C
240/480	310 (388)	375 (469)	403 (504)	415 (519)	430 (538)
220/440	317 (396)	375 (469)	397 (496)	410 (513)	423 (529)
208/416	315 (394)	362 (453)	385 (481)	400 (500)	417 (521)
200/400	305 (381)	350 (438)	372 (465)	385 (481)	403 (504)
190/380	292 (365)	335 (419)	355 (444)	367 (459)	385 (481)

① Rise by resistance method, Mil-Std-705, Method 680.1b.

② Machine rated for Max Ambient of 40 °C, Max Altitude 3300 ft

Summittal Data: 480 Volts*, 415 kW, 519 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase

STD. CONNECTION

Mil-Std-705B Method	Description	Value	Units	Mil-Std-705B Method	Description	Value	Units
301.1b	Insulation Resistance	>1.5 Meg	Ohms	505.3b	Overspeed	2250	RPM
302.1a	High Potential Test			507.1c	Phase Sequence CCW-ODE	ABC	
	Main Stator	1480	Volts	508.1c	Voltage Balance, L-L or L-N	0.2%	
	Main Rotor	1500	Volts	601.4a	L-L Harmonic Max - Total (Distortion Factor)	5.0%	
	Exciter Stator	1500	Volts		L-L Harmonic Max - Single	3.0%	
	Exciter Rotor	1500	Volts	601.1c	Deviation Factor	5.0%	
PMG Stator	1500	Volts					
401.1a	Stator Resistance, Line to Line High Wye Connection	0.012	Ohms	---	TIF (1960 Weightings)	<50	
	Rotor Resistance	0.991	Ohms	---	THF (IEC, BS & NEMA Weightings)	<2%	
	Exciter Stator	18.5	Ohms	Additional Prototype Mil-Std Methods are Available on Request.			
	Exciter Rotor	0.116	Ohms				
	PMG Stator	2.1	Ohms				
410.1a	No Load Exciter Field Amps at 480 Volts Line to Line	0.86	A DC				
420.1a	Short Circuit Ratio	0.525					
421.1a	Xd Synchronous Reactance	2.576	PU	--	Generator Frame	433	
		1.144	Ohms	--	Type	MagnaPlus	
422.1a	X2 Negative Sequence React.	0.174	PU	--	Insulation	Class H	
		0.077	Ohms	--	Coupling - Single Bearing	Flexible	
423.1a	X0 Zero Sequence Reactance	0.041	PU	--	Amortisseur Windings	Full	
		0.018	Ohms	--	Excitation	Ext. Voltage Regulated, Brushless	
425.1a	X'd Transient Reactance	0.124	PU	--	Voltage Regulator	DVR2000E+	
		0.055	Ohms	--	Voltage Regulation	0.25%	
426.1a	X''d Subtransient Reactance	0.111	PU				
		0.049	Ohms				
--	Xq Quadrature Synchronous	1.261	PU	--	Cooling Air Volume	800	CFM
		0.560	Ohms	--	Heat rejection rate	1485	Btu's/min
427.1a	T'd Transient Short Circuit Time Constant	0.067	Sec	--	Full load current	624	Amps
				--	Minimum Input hp required	591.3	HP
428.1a	T''d Subtransient Short Circuit Time Constant	0.016	Sec	--	Full load torque	1725	Lb-ft
				--	Efficiency at rated load :	94.1%	
430.1a	T'do Transient Open Circuit Time Constant	2.27	Sec				
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.018	Sec	--	Weight	2245	lbs

* Voltages refer to wye (star) connection, unless otherwise specified.

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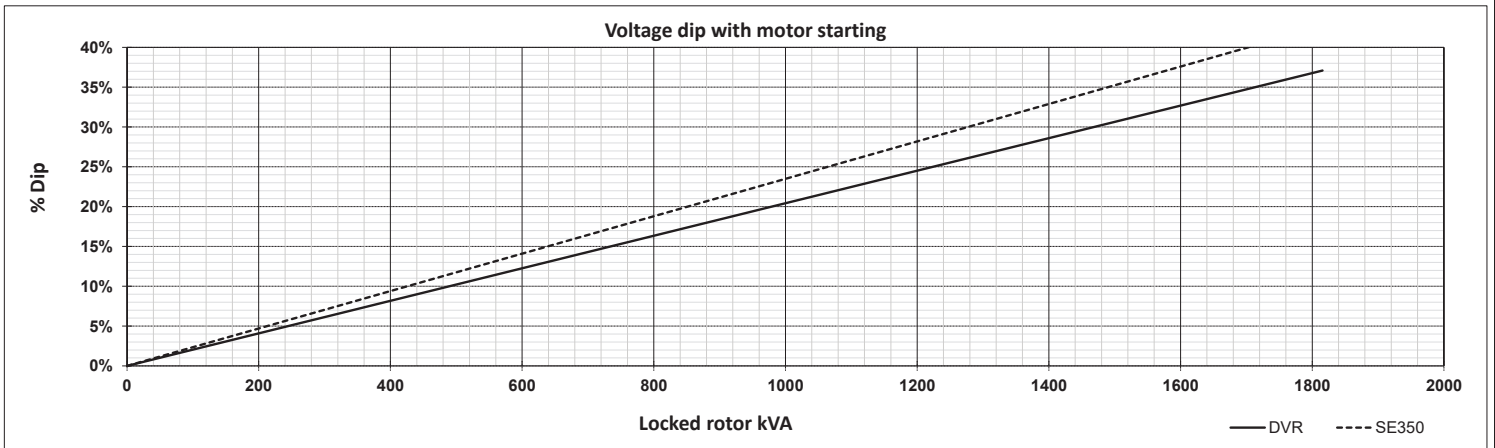
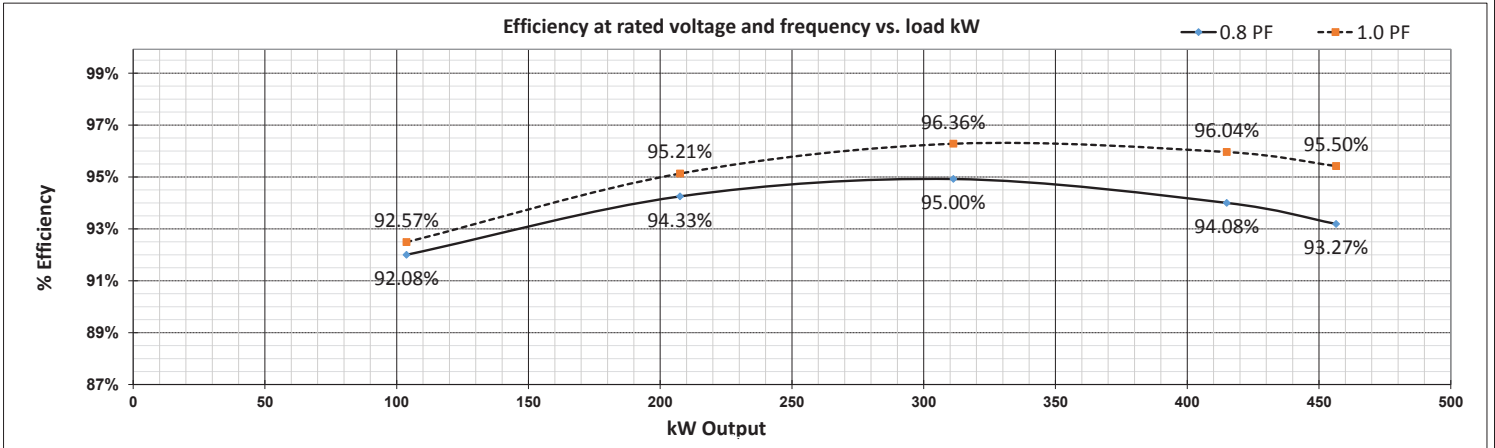
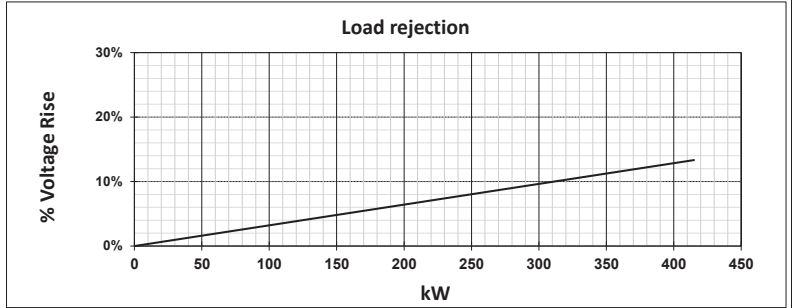
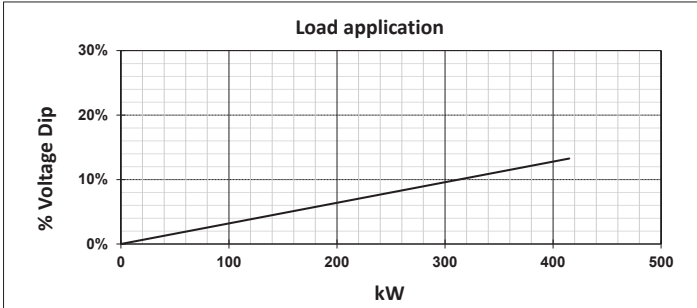
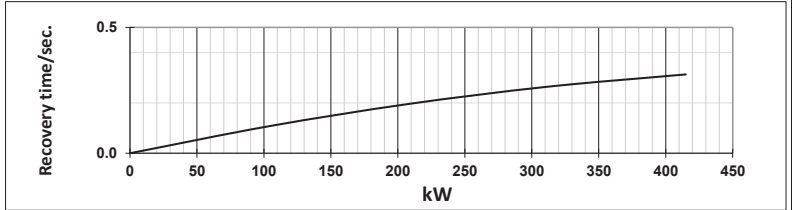
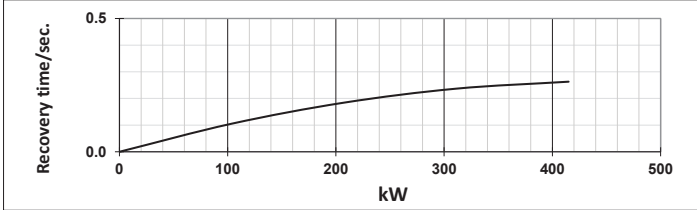
TYPICAL DYNAMIC CHARACTERISTICS

MODEL: 433PSL6220

Date: 02/27/17

Summittal Data: 480 Volts*, 415 kW, 519 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase

Prepared by: Mark Bartz



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DECREMENT CURVE

MODEL: 433PSL6220

Submitted Data: 480 Volts*, 415 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase

Prepared by: Mark Bartz

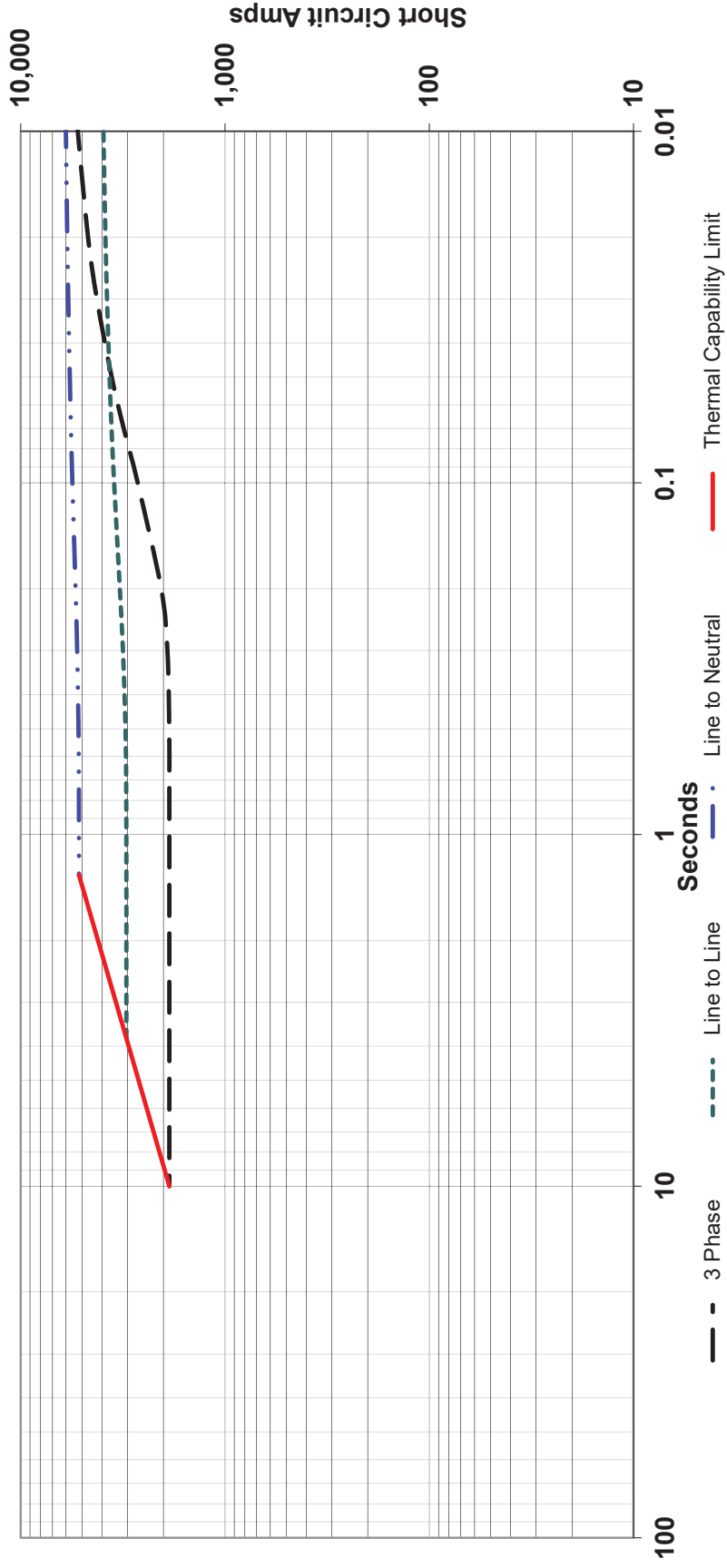
Date : 02/27/17

Full Load Current : 624 amps

Max. 3 ph. Symm. S.C. Current : 5622 amps
INCLUDES EXCITATION SUPPORT (PMG)

Steady State S.C. Current : 1872 amps

Symmetrical Component values, Maximum Asymmetrical Values Are 1.732 Times Symmetrical Values



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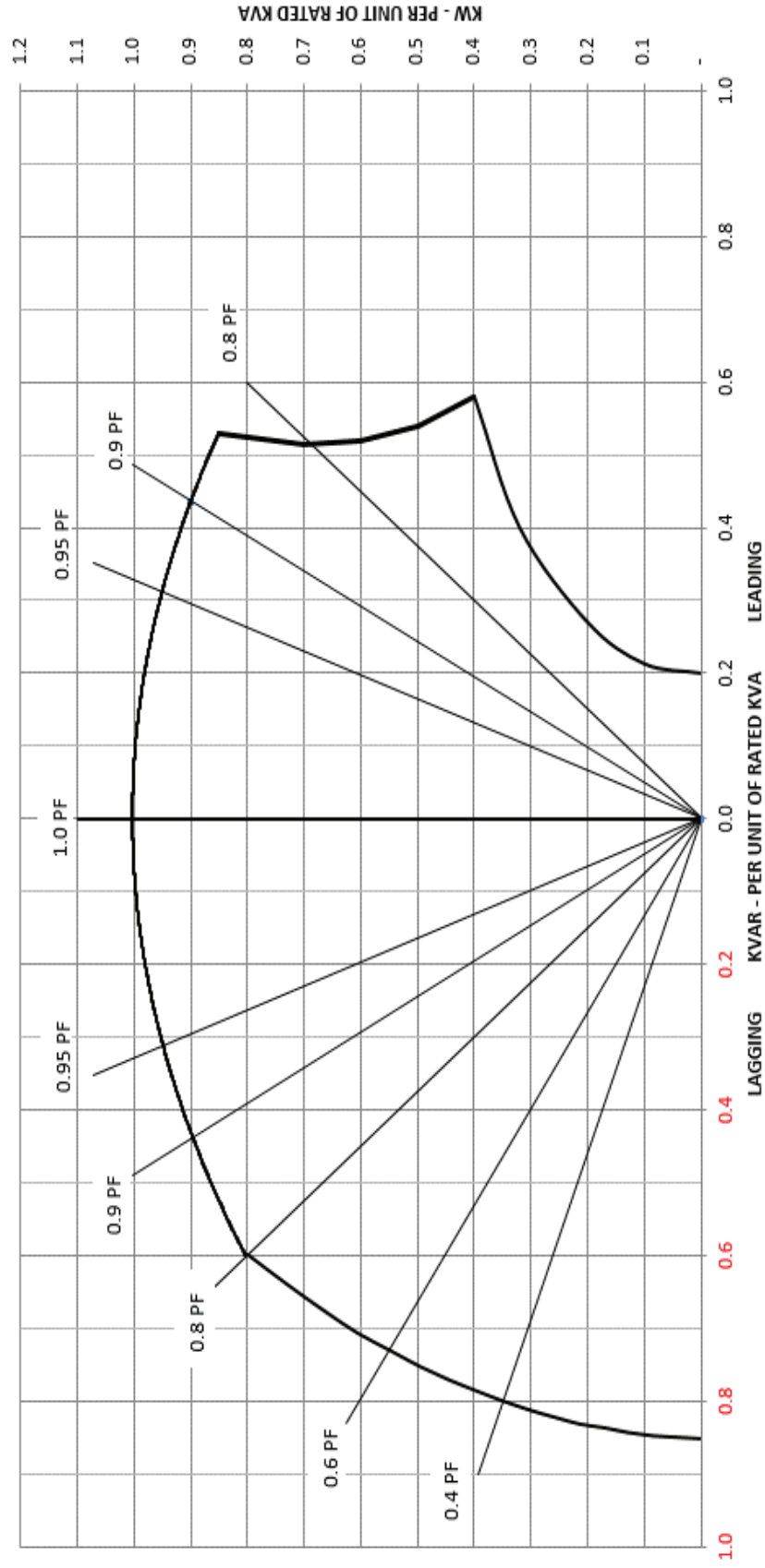
Typical Reactive Capability Curve

MODEL: 433PSL6220

Prepared by: Mark Bartz

Submittal Data: 480 Volts*, 415 kW, 519 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase

Date : 02/27/17



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THERMAL DAMAGE CURVE

MODEL: 433PSL6220

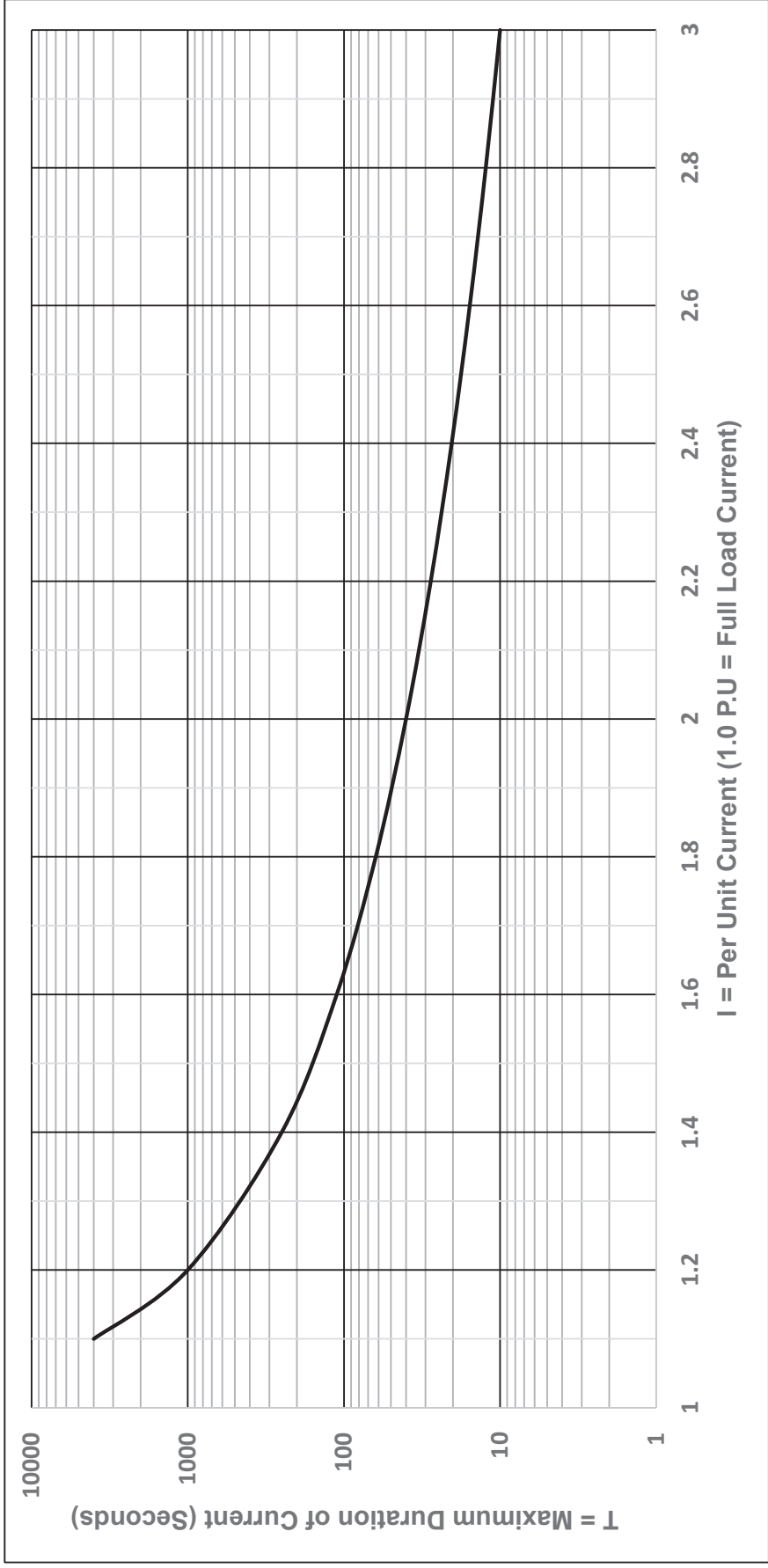
Submittal Data: 480 Volts*, 415 kW, 519 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase

Full Load Current : 624 amps

Prepared by: Mark Bartz

Date : 02/27/17

Base is 3.0 P.U. current for 10 seconds from $T = 40/(I-1)^2$
Windings at operating temperature



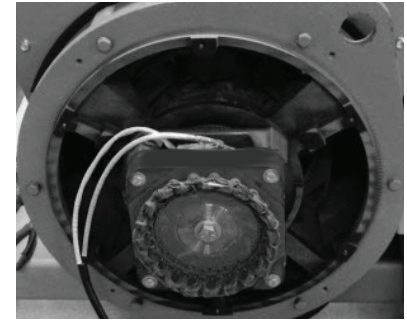
PERMANENT MAGNET GENERATOR (PMG)

Data Sheet



DESCRIPTION

A permanent magnet generator (PMG) is standard on 450 kW and larger units and is available as an optional accessory on most units smaller than 450 kW. The PMG is an improved method of supplying power to the voltage regulator and adds distinct advantages over the alternative shunt type power supply.



FEATURES

Improved Transient Response

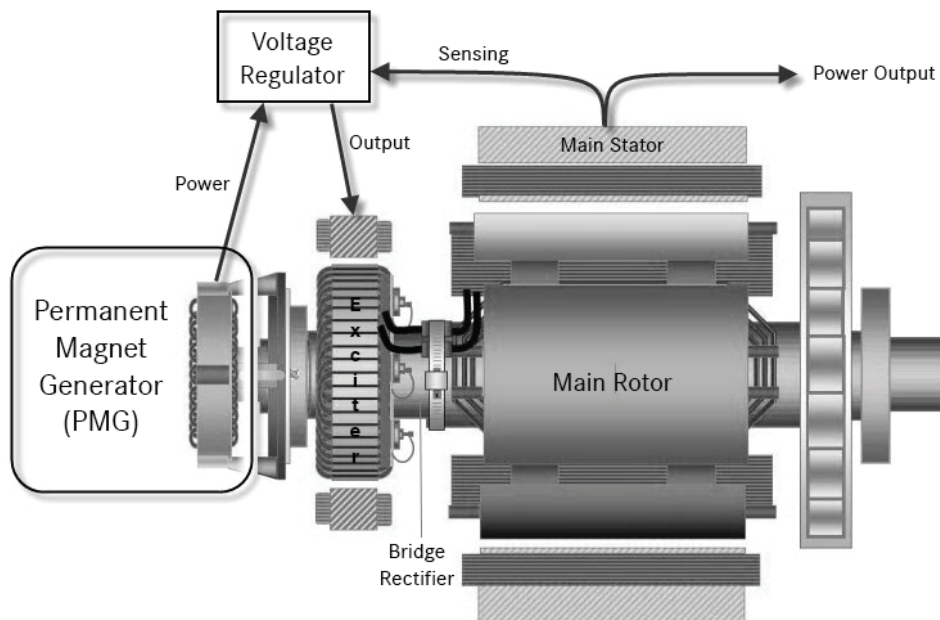
When a generator is subject to a large step load, the generator's terminal voltage experiences a sudden voltage dip. With a shunt style regulator, reduced voltage means the regulator's ability to increase excitation is reduced and voltage recovery will take longer. Power from a PMG is only dependent on the speed of rotation so voltage regulator power, and therefore excitation power, is not compromised during a load step.

300% Short Circuit Capability

The PMG enables the generator to provide up to 300% short circuit current for 10 seconds. This is important when a fault occurs to ensure current continues to flow long enough for downstream breakers to trip and clear the fault. When a fault occurs with a shunt type regulator, the sudden drop in voltage indicates the regulator has no power to increase excitation to keep current flowing. Without current flow, the downstream breakers may not trip.

Resistant to the Effects of Harmonics

A PMG is also beneficial in applications with harmonic producing loads. When rectifier-type loads are present and cause voltage wave form notching, the disrupted voltage wave form can affect voltage regulator operation on shunt powered regulators. Unlike a shunt regulator, the PMG supplies the regulator with a power source which is isolated from the electrical system.



Generator Equipped with PMG

© MTU Onsite Energy. Subject to alteration due to technological advances. 2014-01



DVR[®] 2400 DIGITAL VOLTAGE REGULATOR

NEW FEATURES

- USB 2.0 access through front panel
- Euro style connector for low voltage connections
- Event Logging
- PMG voltage metering
- Polarity configuration for external inputs
- Configurable cut-in and cut-out frequencies
- Retain/reset configuration of remote adjust

FOUR DIGIT HMI DISPLAY

From initial setup to monitoring regulator status, this display provides innovative, fast and easy setup.

REGULATION MODES

Single and Three phase (AVR), Manual Field Current Regulation (FCR), Reactive Power Regulation (VAR) and Power Factor Regulation (PF). All modes compatible with control by external devices.

GENERATOR SOFT START

Controlled increase to rated voltage limits overshoot during voltage build-up in AVR modes.

TRUE RMS VOLTAGE SENSING - SINGLE OR THREE PHASE

Directly sense 100 to 600 Volts at 50/60 Hz. Circuitry senses true RMS voltage for superior regulation.

SINGLE PHASE POWER METERING

FRAME SIZE SPECIFIC PID SELECTION

Simply select the appropriate frame size and your gains are set.

ROBUST GENERATOR PROTECTION FEATURES

9 different Alarm and Shutdown protection features, many are customizable for your application including:

- Field Over & Under Excitation
- Instantaneous Field Over Current
- Generator Over & Under Voltage
- Generator Voltage Imbalance
- Generator Loss of Sensing

DVR[®] 2400 DIGITAL VOLTAGE REGULATOR

SPECIFICATIONS

Voltage Regulation - 0.25% over load range at rated power factor and constant generator frequency.

Output Power - 100 Vdc, 4.0 Adc continuous rating and 190 Vdc, 7.5 Adc forcing capability for one minute.

Exciter Field DC Resistance - 18 to 25Ω Range

Remote Voltage Adjustment - ±30% of nominal via analog input, ±15% via external contacts.

Input Power - 180 to 240 Vac, 250 to 300 Hz PMG power supply

Regulator Sensing - 100 to 600 Vac, 50/60 Hz, 1-phase/3phase

Operating Temperature - From -40°C to +70°C (-40°F to +158°F)

Storage Temperature - From -40° C to +85°C (-40°F to +185°F)

Ingress Protection - IP52 (front side mounted in conduit box along with swing cover); IP10 (rear side with protective cover)

Shock - 20G in 3 perpendicular planes

Vibration - 2.5G at 5 to 26 Hz; 0.050" double amplitude (27 to 52 Hz); 7G at 53 to 500 Hz

Weight - 3.5 lb. (1361 g)

Humidity Testing - Per MIL-STD-705B, Method 711-D

Salt Fog Testing - Per MIL-STD-810E

EMI Compatibility

Immunity

Meets EN 61000-6-2: 2005 Electromagnetic compatibility (EMC) -Part 6-2: Generic standards- immunity for industrial environments.

Emission

- Meets EN 61000-6-4: 2007 Electromagnetic compatibility (EMC) - Part 6-4: Generic Standards - emission standard for industrial environments

EMI Compatibility Tests

Immunity

- Electrostatic Discharge (ESD): IEC 61000-4-2
- Radiated RF: IEC 61000-4-3
- Electrical Fast Transient (EFT) /Burst: IEC 61000-4-4
- Conducted RF: IEC 61000-4-6
- Power Frequency and Magnetic Field: IEC 61000-4-8

Emission

- Radiated RF: EN 61000-6-4: 2007, 30 MHz to 1000 MHz

marathon[®]
Generators

Regal Beloit America, Inc.

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www.marathonelectric.com

APPLICATION CONSIDERATIONS

The proper selection and application of power generation products and components, including the related area of product safety, is the responsibility of the customer. Operating and performance requirements and potential associated issues will vary appreciably depending upon the use and application of such products and components. The scope of the technical and application information included in this publication is necessarily limited. Unusual operating environments and conditions, lubrication requirements, loading supports, and other factors can materially affect the application and operating results of the products and components and the customer should carefully review its requirements. Any technical advice or review furnished by Regal Beloit America, Inc. and/or its affiliates ("Regal") with respect to the use of products and components is given in good faith and without charge, and Regal assumes no obligation or liability for the advice given, or results obtained, all such advice and review being given and accepted at customer's risk.

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REGAL[®]



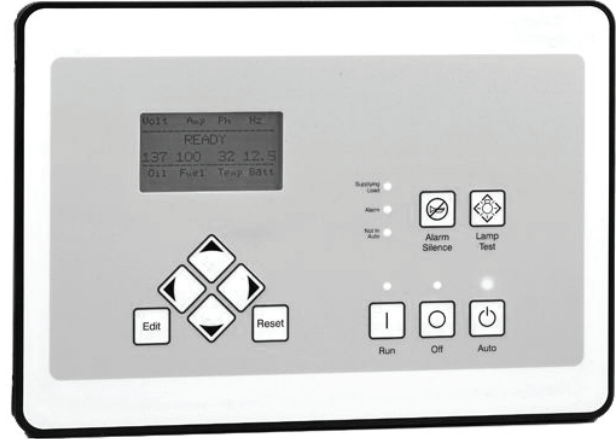
Digital Generator Set Controller Data Sheet

MGC-2000 Series

The MGC-2000 Series controllers include the following models which are described throughout this document.*

- MGC-2010
- MGC-2020
- MGC-2050

mtu Generator Set Controllers (MGC Series) are highly advanced integrated digital generator set control systems. The MGC-2000 Series is perfectly focused, combining rugged construction and microprocessor technology to offer a product that will hold up to almost any environment and is flexible enough to meet your application's needs. The MGC-2000 Series provides generator set control, transfer switch control, metering, protection, and programmable logic in a simple, easy-to-use, reliable, rugged, and cost effective package.



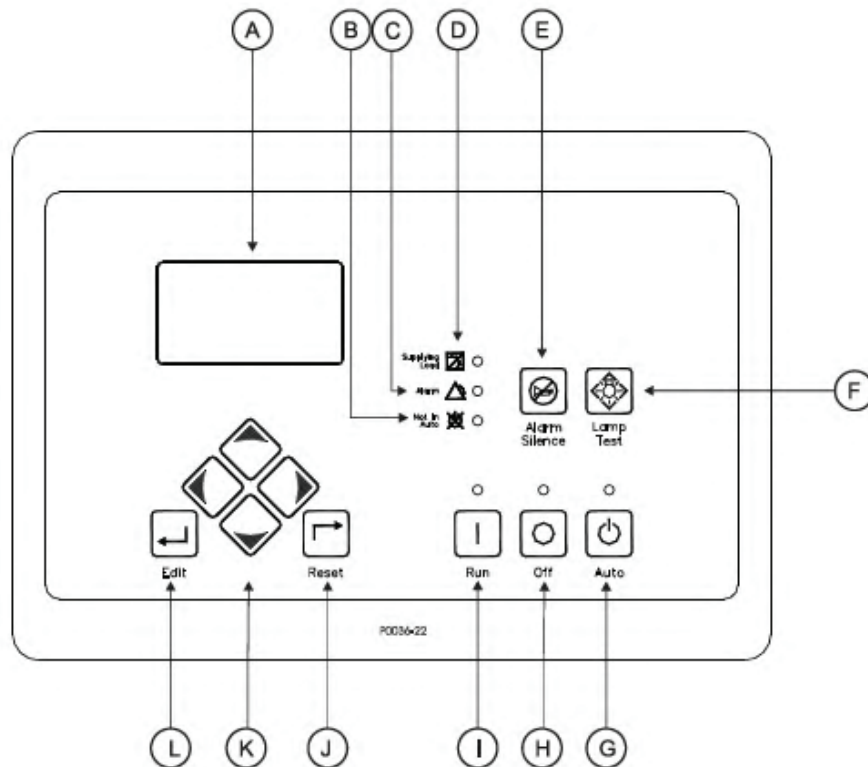
PRODUCT HIGHLIGHTS

- Three-phase generator metering
- Engine metering
- Generator set control
- Engine and generator protection
- Var sharing over Ethernet
- BESTCOMSPlus[®]
 - Windows[®]-based software for optional remote operation (Software can be downloaded at www.mtu-solutions.com)
 - Programming and setup software
 - Intuitive and powerful
 - Remote control and monitoring
 - Programmable logic
 - USB communications
- Automatic transfer switch compatible
- Exercise timer
- Suitable for use on rental generator sets with high/low line sensing, single or three phase sensing override, and wye/delta/grounded delta
- SAE J1939 Engine Control Unit (ECU) communications
- Automatic generator configuration detection
- Selection of integrating reset of instantaneous reset characteristics for overcurrent protection
- Multilingual capability
- Remote annunciation to RDP-110
- Extremely rugged, fully potted design
- 16 programmable contact inputs, 12 programmable contact outputs
- ModBus[™] communications with RS-485 (Refer to *Configuration Options*.)
- UL recognized, CSA certified, CE approved
- Highly Accelerated Life Tests (HALT) tested
- IP 54 front panel rating with integrated gasket
- NFPA-110 compatible
- Microprocessor based
- Complete system metering
- Expandable to meet customer needs

*Please refer to the last page of this data sheet for available MGC-2000 Series configuration options. The MGC Series Controller Comparison Data Sheet is available as a reference for all MGC Series configuration options.

MGC-2000 Series Digital Generator Set Controller Data Sheet

DIAGRAM



Front Panel Descriptions

- | | | |
|-----------------------------|---------------------------------------|--------------------------------------|
| A. Liquid Crystal Display | E. Alarm Silence Pushbutton | I. Run Pushbutton and Mode Indicator |
| B. Not in Auto Indicator | F. Lamp Test Pushbutton | J. Reset Pushbutton |
| C. Alarm Indicator | G. Auto Pushbutton and Mode Indicator | K. Arrow Pushbuttons |
| D. Supplying Load Indicator | H. Off Pushbutton and Mode Indicator | L. Edit Pushbutton |

FUNCTIONS

Generator set protection

Generator ANSI codes

- Overvoltage (59)
- Overfrequency (81o)
- Reverse power (32)
- Undervoltage (27)
- Underfrequency (81u)
- Loss of excitation (40q)
- Phase imbalance (47)
- Overcurrent (51) (optional)
- Vector shift (78) (optional)
- Rate of change of frequency (ROCOF) (81R)
(Refer to *Configuration Options*.)

Alarms (Shutdowns)

- Low oil pressure
- High coolant temperature
- Low coolant level
- Overspeed
- Overcrank
- Coolant temp sender fail (non-ECU engines)
- Oil pressure sender fail (non-ecu engines)
- Emergency stop
- Critical low fuel level (Refer to *Configuration Options*.)

All generator set protection features are programmable as alarms, pre-alarms, status, or not used.

FUNCTIONS, continued:

Generator Set Protection, continued:

Pre-alarms (Warnings)

- Low oil pressure
- High coolant temperature
- Low coolant temperature
- Battery overvoltage
- Weak battery voltage
- Aem comms failure
- Breaker open failure
- Cem comms failure
- Generator reverse rotation
- Engine kw overload (three levels)
- Loss of sensing
- Checksum failure
- Ecu comms fail
- Low fuel level
- High fuel level
- Active diagnostic trouble codes (DTC)
- Breaker close failure
- Low battery voltage

All alarms and pre-alarms can be enabled or disabled via the BESTCOMSP^{Plus}® PC software or the front panel. Additional custom alarms and pre-alarms are available upon request.

Generator set metering

- Generator parameters include voltage, current, real power (watts), apparent power (VA), and power factor (PF).
- Engine parameters include oil pressure, coolant temperature, battery voltage, speed, fuel level, engine load, coolant level (from ECU), ECU specific parameters, and run-time statistics.

Engine control

- Cranking control: cycle or continuous (quantity and duration fully programmable)
- Engine cooldown: smart cooldown function saves fuel and engine life
- Successful start counter: counts and records successful engine starts
- Timers:
 - Engine cooldown timer
 - Engine maintenance timer
 - Pre-alarm time delays for weak/low battery voltage
 - Alarm time delay for overspeed
 - Alarm time delay for sender failure
 - Arming time delays after crank disconnect:
 - Low oil pressure
 - High coolant temperature
 - Pre-crank delay
 - Continuous or cycle cranking time delay
 - Programmable logic timers

Event recording

The MGC-2000 Series has an event recorder that provides a record of alarms, pre-alarms, engine starts, engine runtime loaded, engine runtime unloaded, last run date, and many other events that are all date and time stamped to help the user determine the cause and effect of issues related to the generator set. Contains 30 event records each retaining up to 99 occurrences in memory. Time, date, and engine hour detail is available for the most current 30 occurrences within each event record.

Transfer switch control (Mains failure)

The MGC-2000 Series has the ability to detect a mains failure via a single- or three-phase bus input. A mains failure is established when any one of the following conditions are met:

- Any phase of bus voltage falls below the dead bus threshold
- Any phase of bus voltage is unstable due to overvoltage or undervoltage
- Any phase of bus voltage is unstable due to overfrequency or underfrequency

When conditions are met, the MGC-2000 Series will start the generator set and, when ready, will send generator and mains breaker commands to apply power to the load from the generator set. The MGC-2000 Series implements open or closed breaker transitions to and from the mains. When the mains returns and is considered stable, the MGC-2000 Series will transfer the load back to the mains and stop the engine.

ModBus™ RTU

When utilized, the user can send and receive information from the MGC-2000 Series via the RS-485 communications port and ModBus™ RTU protocol. This feature allows the MGC-2000 Series controlled generator set to be fully integrated into the building management system. Please see the *MGC-2000 Series Controller Manual* for the ModBus™ register list.

Programmable logic

The MGC-2000 Series offers a very powerful, yet easy-to-use, programmable logic scheme, BESTlogic™*Plus*, for custom programming of the various inputs, outputs, alarms, and pre-alarms. It allows these elements to be integrated into a complete logic scheme so that the user can meet even the most complex specification. The programmable logic control includes the selection of logic gates and timers, with drag-and-drop technology to make it fast and simple.

MGC-2000 Series Digital Generator Set Controller Data Sheet

FUNCTIONS, continued:

Remote display panel annunciation

The MGC-2000 Series can communicate to a remote display panel, Model RDP-110. This requires only two wires to annunciate all of the alarms and pre-alarms required by NFPA-110 Level I and II. External power is required.

External modem interface

The MGC-2020 and MGC-2050 controllers include an external modem interface permitting an external modem to be connected to the MGC controller via RS-232. A dial-out modem enables remote control, monitoring, and setting of the MGC-2000 Series. When an alarm or pre-alarm condition occurs, the MGC-2000 Series can dial up to four telephone numbers in sequence until an answer is received and the condition is annunciated.

Note: Only an external modem interface is provided. The external modem must be provided by a third party. The external modem is only available on the MGC-2020 and MGC-2050 controller configurations of the MGC-2000 Series.

SAE J1939 communications

SAE J1939 CANBus communications allows the MGC-2000 Series to communicate with the ECU to gather critical engine information like oil pressure, engine coolant temperature, RPM, battery voltage, and much more. By utilizing the ECU, the addition of analog engine senders is no longer required. This can save substantial money for the installer. It also eliminates any errors or discrepancies between the ECU data and the data displayed on the MGC-2000 Series that may be present due to analog sender inaccuracies or incompatibility. An additional benefit is access to the ECU's diagnostic troubleshooting codes (DTCs). The DTCs provide information about the engine's operating conditions and communicates these, via SAE J1939, to the MGC-2000 Series, eliminating the need for hand-held service tools to diagnose simple engine issues.

SPECIFICATIONS

Operating power

- Nominal: 12 or 24 VDC
- Range: 6 to 32 VDC
- Power consumption:
 - Sleep Mode: 5W with all relays non-energized
 - Normal operational mode: 7.9W - run mode, LCD heater off, six relays energized
- Battery ride-through: withstands cranking ride-through down to 0 V for 50 ms, starting at 10 VDC.

Current sensing (5 A CT inputs)

- Continuous rating: 0.1 to 5.0 Aac
- One second rating: 10 Aac
- Burden: 1 VA

Voltage sensing

- Range: 12 to 576 V rms, line-to-line
- Frequency range: 10 to 72 Hz
- Burden: 1 VA
- One second rating: 720 V rms

Input contacts

Contact sensing inputs include one emergency stop input and 16 programmable inputs. The emergency stop input accepts normally closed, dry contacts. The remote emergency stop is limited to 75 ft. standard. Extended runs are available with optional relay. All programmable inputs accept normally open, dry contacts. The factory utilizes up to three of these inputs.

Engine System Inputs

- Fuel Level Sensing Resistance Range: 0 to 250 Ω nominal
- Coolant Temperature Sensing Resistance Range: 10 to 2,750 Ω nominal
- Oil Pressure Sensing Resistance Range: 0 to 250 Ω nominal
- Engine Speed Sensing:
 - Magnetic Pickup or CANBus
 - Magnetic Pickup Voltage Range: 3 to 35 V peak (6 to 70 V peak to peak)
 - Magnetic Pickup Frequency Range: 32 to 10,000 Hz
 - Generator Frequency (alternate or redundant)
 - Voltage Range: 12 to 576 V rms

Output contacts

- (15) total programmable outputs: (3) 30 A @ 28 VDC and (12) 2 A @ 30 VDC
- The factory utilizes the following on each generator set which can be reprogrammed as needed:
 - (3) 30 A @ 28 VDC for pre-start, start, and run
 - (12) 2 A @ 30 VDC for general purpose

SPECIFICATIONS, continued:

Metering

Generator and bus voltage (rms)

- Metering range: 0 to 576 VAC (direct measurement); up to 9,999 VAC (with appropriate voltage transformer)
- Accuracy: $\pm 1\%$ of programmed rated voltage of ± 2 VAC (subject to accuracy of voltage transformer when used)

Generator current (rms)

- Generator current is measured at the secondary windings of 5 A CTs.
- Metering range: 0 to 5,000 Aac
- CT primary range: 1 to 5,000 Aac, in primary increments of 1 Aac
- Accuracy: $\pm 1\%$ of programmed rated current or ± 2 Aac (subject to accuracy of CTs)

Generator and bus frequency

- Metering range: 10 to 72 Hz
- Accuracy: $\pm 0.25\%$ or 0.05 Hz

Apparent power

- Indicates total kVA and individual line kVA (four-wire, line-to-neutral or three-wire, line-to-line).
- Accuracy: $\pm 3\%$ or the full-scale indication or ± 2 kVA

Power factor

- metering range: 0.2 leading to 0.2 lagging
- Accuracy: ± 0.02

Real power

- Indicates total kW and individual line kW (four-wire, line-to-neutral or three-wire, line-to-line)
- Accuracy: $\pm 3\%$ of the full-scale indication or ± 2 kW

Oil pressure

- Metering range: 0 to 150 psi or 0 to 1,034 kPa
- Accuracy: $\pm 3\%$ of actual indication or ± 2 psi or ± 12 kPa (subject to accuracy of sender)

Coolant temperature

- Metering range: 0 °C to 204 °C (32 °F to 410 °F)
- Accuracy: $\pm 3\%$ of actual indication or $\pm 2^\circ$ (subject to accuracy of sender)

Fuel level

- Metering range: 0 to 100%
- Accuracy: $\pm 2\%$ (subject to accuracy of sender)

Battery voltage

- Metering range: 6 to 32 VDC
- Accuracy: $\pm 3\%$ of actual indication or ± 0.2 VDC

Engine RPM

- Metering range: 0 to 4,500 rpm
- Accuracy: $\pm 2\%$ of actual indication or ± 2 rpm

Engine run time

- Engine run time is retained in non-volatile memory.
- Metering range: 0 to 99,999 h; update interval: 6 min
- Accuracy: $\pm 1\%$ of actual indication or ± 12 min

Maintenance timer

- Maintenance timer indicates the time remaining until generator set service is due. Value is retained in non-volatile memory.
- Metering range: 0 to 5,000 h; update interval: 6 min
- Accuracy: $\pm 1\%$ of actual indication or ± 12 min

Generator protection functions

Overvoltage (59) and undervoltage (27)

- Pickup range: 70 to 576 VAC
- Activation delay range: 0 to 30 s

Overfrequency (81O) and underfrequency (81U)

- Pickup range: 45 to 66 Hz
- Pickup increment: 0.1 Hz
- Activation delay range: 0 to 30 s

Reverse power (32)

- Pickup range: -50 to 5%
- Pickup increment: 0.1%
- Hysteresis range: 1 to 10%
- Hysteresis increment: 0.1%
- Activation delay range: 0 to 30 s
- Activation delay increment: 0.1 S

Loss of excitation (40Q)

- Pickup range: -150 to 0%
- Pickup increment: 0.1%
- Hysteresis range: 1 to 10%
- Hysteresis increment: 0.1%
- Activation delay range: 0 to 30 s
- Activation delay increment: 0.1 S

MGC-2000 Series Digital Generator Set Controller Data Sheet

SPECIFICATIONS, continued:

Generator protection functions, continued:

Phase imbalance (47)

- Pickup range: 5 to 100 VAC
- Pickup increment: 1 VAC
- Activation Delay Range: 0 To 30 S
- Activation Delay Increment: 0.1 S

ROCOF (81R) (optional)

- Pickup range: 0.2 to 10 Hz/s
- Pickup increment: 0.1 Hz/s
- Activation delay range: 0 to 10,000 ms
- Activation delay increment: 1 ms
- Accuracy: 0.2 Hz/s
-

Overcurrent (51)

- Pickup range: 0.18 to 1.18 Aac (1 A current sensing)
- Time dial range: 0

Vector shift (78) (optional)

- Pickup range: 2 to 90°
- Pickup increment: 1°
- Accuracy: $\pm 1^\circ$

Environmental

- Temperature
 - Operating: -40 °C to 70 °C (-40 °F to 158 °F)
 - Storage: -40 °C to 85 °C (-40 °F to 185 °F)
- Humidity: IEC 68-2-38
- Salt fog: ASTM B 17-73, IEC 68-2-11 (tested while operational)
- Ingress protection: IEC IP54 for front panel
- Shock: 15 G in three perpendicular planes
- Vibration: 5 to 29 to 5 Hz at 1.5 G peak for 5 min.
29 to 52 to 29 Hz at 0.036" DECS-A for 2.5 min.
52 to 500 to 52 Hz at 5 G peak for 7.5 min.
 - Swept over the above ranges for 12 sweeps in each of three mutually perpendicular planes with each 15 minute sweep

Agency approvals

- UL/CSA approvals: "cURus" approved to UL 6200 and CSA C22.2 No.14
- NFPA compliance: complies with NFPA Standard 110, standard for emergency and standby power
- CE marked: complies with applicable EC directives

ADDITIONAL SPECIFICATIONS

Battery backup for real time clock

The MGC-2000 Series provides a real-time clock with an internal backup battery. The battery will maintain timekeeping for approximately 10 years (depending on conditions) after power is removed from the controller. The clock is used by the event recorder and sequence of events functions to time-stamp events, and the exercise timer is used to start and stop the generator set when the exercise feature is utilized.

Breaker management

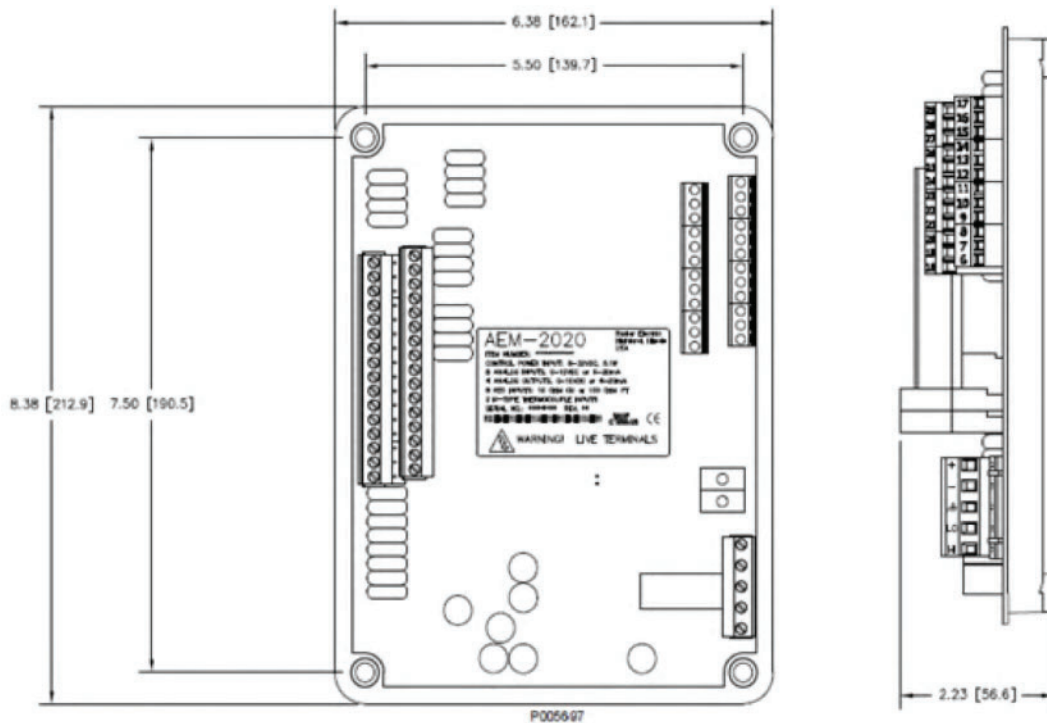
The MGC-2000 Series is capable of controlling the generator breaker and the mains breaker. The status of the breakers is determined by using BESTlogic™Plus programmable logic to set up the GENBRK and MAINSBRK logic blocks. These logic blocks have outputs that can be configured to energize an output contact and control a breaker, as well as inputs for breaker control and status. The MGC-2000 Series will attempt to close a breaker only after verifying that it can be closed. If the breaker cannot be closed, the close request will be ignored. Only one breaker can be closed at a time. Synchronization is required before closing the breaker to a live bus. Closure to a dead bus can be performed after meeting dead bus threshold and timing requirements set by the user.

OPTIONAL ACCESSORIES

Analog Extension Module 2020 (AEM-2020)

The optional AEM-2020 is a remote auxiliary device that provides additional MGC-2000 Series analog inputs and outputs. Its features include:

- **Eight analog inputs:** The AEM-2020 provides eight analog inputs that are user-selectable for 4 to 20 mA or 0 to 10 VDC. Each analog input has under/over thresholds that can be configured as status only, alarm, or pre-alarm. When enabled, an out of range alarm alerts the user of an open or damaged analog input wire. The label text of each analog input is customizable
- **Eight Resistance Temperature Detector (RTD) inputs:** The AEM-2020 provides eight user-configurable RTD inputs for monitoring generator set temperature. Each RTD input can be configured as status only, alarm, or pre-alarm to protect against high or low temperature conditions. When enabled, an out-of-range alarm alerts the user of an open or damaged RTD input wire. The label text of each RTD input is customizable.
- **Two thermocouple inputs:** The AEM-2020 provides two thermocouple inputs for monitoring generator set temperature. Each thermocouple input can be configured as status only, alarm, or pre-alarm to protect against high or low temperature conditions. When enabled, an out-of-range alarm alerts the user of an open or damaged thermocouple input wire. The label text of each thermocouple input is customizable.
- **Four analog outputs:** The AEM-2020 provides four analog outputs that are user-selectable for 4 to 20 mA or 0 to 10 VDC. A wide selection of parameters including oil pressure, fuel level, generator voltage, and bus voltage can be configured as analog outputs. Refer to *Section 4, BESTCOMSPUs[®] Software of the MGC-2000 Series Controller Manual*, for a full list of parameter selections.
- **Communications via CANBus:** A Control Area Network (CAN) is a standard interface that enables communication between the AEM-2020 and the MGC-2000 Series.



Input and Output Terminals

MGC-2000 Series Digital Generator Set Controller Data Sheet

OPTIONAL ACCESSORIES, CEM-2020, continued

Contact Expansion Module 2020 (CEM-2020)

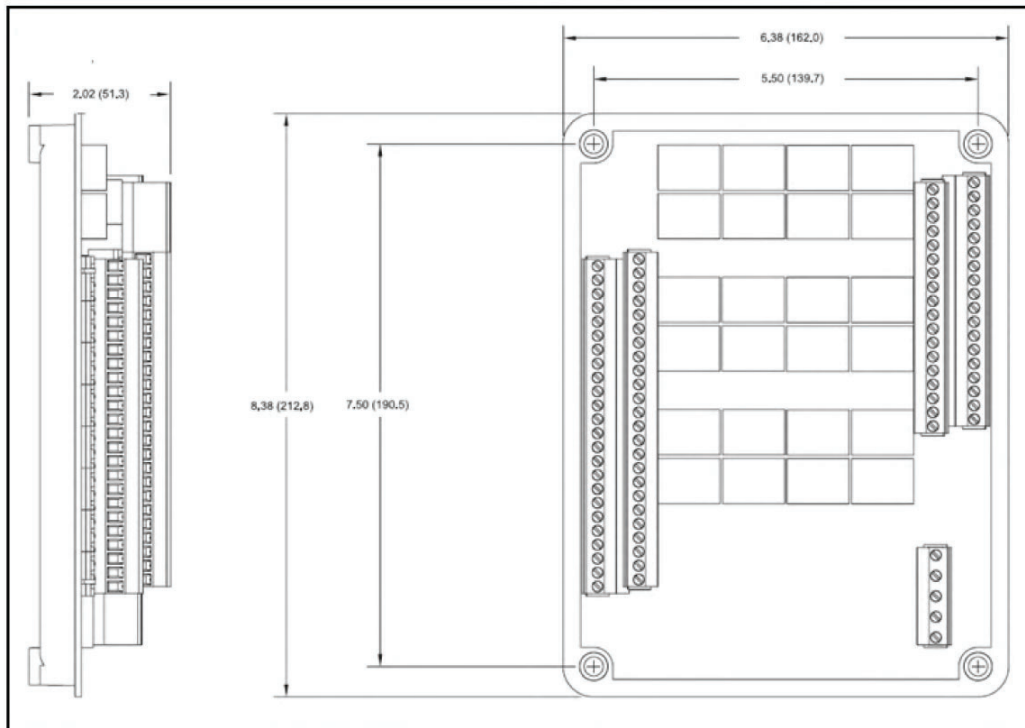
The CEM-2020 is a remote device that provides additional MGC-2000 Series contact inputs and outputs, giving the user flexibility to use the same model MGC-2000 Series generator set controller for simple or complicated applications that require contact functionality or duplication of contacts for remote annunciation. Its features include:

- **10 Contact Inputs:** The CEM-2020 provides 10 programmable contact inputs with the same functionality as the contact inputs on the MGC-2000 Series.
- **24 Output Contacts:** The CEM-2020 provides 24 Form C programmable output contacts with the same functionality as the output contacts on the MGC-2000 Series. The output ratings of the Form C contacts are:

Output No.	Rating (Cont.)	Additional Information
13-24	1 A @ 30 VDC	This is a gold flash contact for low current circuits.
25-36	4 A @ 30 VDC	

- **Communications via CANBus:** The CEM-2020 communicates to the MGC-2000 Series via SAE J1939 CANBus communications and allows the user to program the functionality of these inputs and outputs in the BESTCOMSPPlus® software.
- The user can add labels for the inputs and outputs that appear in BESTCOMSPPlus®, show up on the front panel, and in programmable logic. All the functionality can be assigned

to these inputs and outputs as if they were an integrated part of the MGC-2000 Series. The CEM-2020 module has all of the environmental ratings of the MGC-2000 Series, including a model for UL Class1 Div2 applications. The CEM-2020 terminals accept a maximum wire size of 12 AWG, while the chassis ground requires 12 AWG wire. Flexibility is one of the benefits of the MGC-2000 Series, and this add-on module enhances that benefit even further.



CEM-2020 Overall Dimensions

MGC-2000 Series Digital Generator Set Controller Data Sheet

CONFIGURATION OPTIONS

Generator protection	MGC-2010	MGC-2020	MGC-2050
Standard			
Phase Imbalance (47)		✓	✓
Overcurrent (50)			
Overvoltage (59)	✓	✓	✓
Undervoltage (27)	✓	✓	✓
Underfrequency (81U)	✓	✓	✓
Overfrequency (81O)	✓	✓	✓
Reverse Power (32)	✓	✓	✓
Loss of Excitation (40Q)	✓	✓	✓
Enhanced			
Overcurrent (51)		✓	✓
Vector Shift (78)		✓	✓
Rate of Change of Frequency (81R)		✓	✓
Ground Fault			

Inputs	MGC-2010	MGC-2020	MGC-2050
Controller			
Digital	16	16	16
Analog (Dedicated)	3	3	3
Analog	-	-	-
CEM			
Digital	10	10	10
AEM			
Analog	8	8	8
TC	2	2	2
RTD	8	8	8

Outputs	MGC-2010	MGC-2020	MGC-2050
Controller			
Digital Form A, 30 Amp	3	3	3
Digital Form A, 5 Amp	-	-	-
Digital Form A, 2 Amp	12	12	12
Analog	-	-	-
CEM			
Digital Form C, 4 Amp	12	12	12
Digital Form C, 1 Amp	12	12	12
AEM			
Analog	4	4	4
External to Controllers / (CEM)			
Digital Form C, 10 Amp (Interposing Relay)	10	10	10

Communication	MGC-2010	MGC-2020	MGC-2050
ModBus RTU (RS-485)	✓	✓	✓
ModBus TCP-IP			
RDP-110	✓	✓	✓
CANBus	✓	✓	✓
Modem Interface (RS-232)		✓	✓
Ethernet			

Metering	MGC-2010	MGC-2020	MGC-2050
Bus 1 Voltage			
Single Phase	✓	✓	✓
Three Phase	✓	✓	✓
Bus 2 Voltage			
Single Phase			
Three Phase			
Current Transformers			
Generator	3	3	3
Auxiliary	-	-	-

DIGITAL GENERATOR SET CONTROLLER

MGC Series Comparison Data Sheet



MTU Onsite Energy has a variety of options available when it comes to selecting a reliable, easy-to-use, and rugged generator set control system. This data sheet is intended to be used only as a reference to determine which configuration of our MTU Onsite Energy Generator Set Controllers (MGC) would best fit your needs. Detailed information can be found on the MGC-1500 Series Data Sheet, MGC-2000 Series Data Sheet, and MGC-3000 Series Data Sheet. Please contact your MTU Onsite Energy Account Manager for more information.

GENERATOR PROTECTION

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Standard							
Phase Imbalance (47)	✓	✓		✓	✓	✓	✓
Overcurrent (50)	✓	✓					
Overvoltage (59)	✓	✓	✓	✓	✓	✓	✓
Undervoltage (27)	✓	✓	✓	✓	✓	✓	✓
Underfrequency (81U)	✓	✓	✓	✓	✓	✓	✓
Overfrequency (81O)	✓	✓	✓	✓	✓	✓	✓
Reverse Power (32)			✓	✓	✓	✓	✓
Loss of Excitation (40Q)			✓	✓	✓	✓	✓
Enhanced							
Overcurrent (51)				✓	✓	✓	✓
Vector Shift (78)				✓	✓	✓	✓
Rate of Change of Frequency (81R)				✓	✓	✓	✓
Ground Fault						✓	✓

Note: Numbers in parentheses above are ANSI standard device numbers denoting which features the controllers support.

INPUTS

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Controller							
Digital	7	7	16	16	16	16	16
Analog (Dedicated)	3	-	3	3	3	3	3
Analog	-	-	-	-	-	2	2
CEM							
Digital	-	10	10	10	10	4x10	4x10
AEM							
Analog	-	-	8	8	8	4x8	4x8
TC	-	-	2	2	2	4x2	4x2
RTD	-	-	8	8	8	4x8	4x8

DIGITAL GENERATOR SET CONTROLLER

MGC Series Comparison Data Sheet



OUTPUTS

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Controller							
Digital Form A, 30 Amp	-	-	3	3	3	3	3
Digital Form A, 5 Amp	3	3	-	-	-	-	-
Digital Form A, 2 Amp	4	4	12	12	12	12	12
Analog	-	-	-	-	-	2	2
CEM							
Digital Form C, 4 Amp	-	12	12	12	12	4x12	4x12
Digital Form C, 1 Amp	-	12	12	12	12	4x12	4x12
AEM							
Analog	-	-	4	4	4	4x4	4x4
External to Controllers / (CEM)							
Digital Form C, 10 Amp (Interposing Relay)	-	10	10	10	10	10	10

COMMUNICATION

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
ModBus RTU (RS-485)			✓	✓	✓	✓	✓
ModBus TCP-IP						✓	✓
RDP-110	✓	✓	✓	✓	✓	✓	✓
CANBus		✓	✓	✓	✓	✓	✓
Modem Interface (RS-232)				✓	✓	✓	✓
Ethernet					✓ (LSM)	✓	✓

METERING

	MGC-1510	MGC-1520	MGC-2010	MGC-2020	MGC-2050	MGC-3010	MGC-3050
Bus 1 Voltage							
Single Phase	✓	✓	✓	✓	✓	✓	✓
Three Phase	✓	✓	✓	✓	✓	✓	✓
Bus 2 Voltage							
Single Phase							✓
Three Phase							✓
Current Transformers							
Generator	3	3	3	3	3	3	3
Auxiliary	-	-	-	-	-	1	4

© MTU Onsite Energy. Subject to alteration due to technological advances. 2015-10

BREAKER



Main

Product or component type	Circuit breaker
Range of product	PowerPact P
Current sensor rating range	800 A FACTORY SET TO 700AMP
Breaking capacity code	G
Trip unit technology	Electronic standard Micrologic 5.0 LSI
Device short name	A

Complementary

Line Rated Current	800 A
Product certifications	CSA UL listed IEC
System Voltage	600 V AC
Mounting mode	Unit mount
Poles description	3P
Breaking capacity	65 kA at 240 V AC 35 kA at 480 V AC 18 kA at 600 V AC
[Ics] rated service short-circuit breaking capacity	100 %
Electrical connection	Lugs load Lugs line
AWG gauge	AWG 3/0...500 kcmil (aluminium/copper) 3
Height	12.86 in
Depth	8.07 in
Width	8.27 in

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Ordering and shipping details

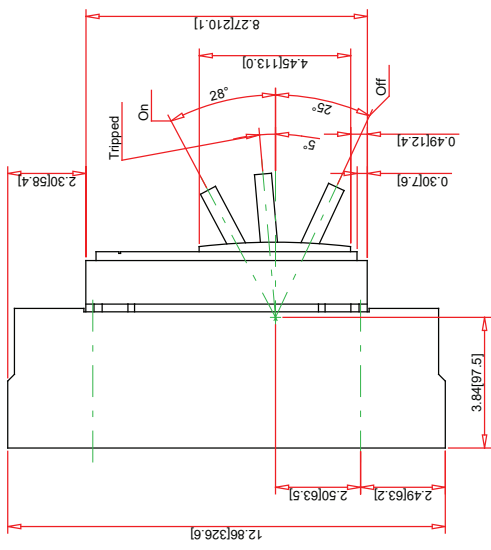
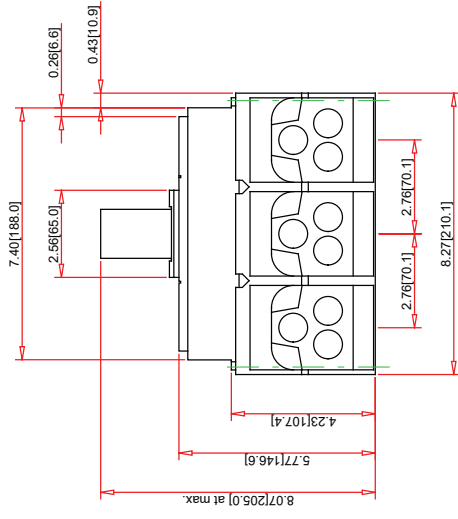
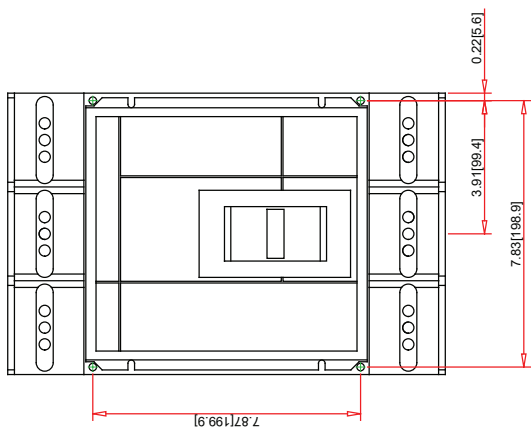
Category	01215 - PG,H,J,K,L,N UNIT MT BREAKERS
Discount Schedule	DE2
GTIN	00785901852391
Nbr. of units in pkg.	1
Package weight(Lbs)	32
Returnability	Y
Country of origin	US

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 1323 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACH	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Available

Contractual warranty

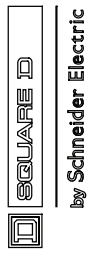
Warranty period	18 months
-----------------	-----------



Part No.:

PGL36080CU33A

Schneider Electric United States
 North American Division
 Boston One Campus
 800 Federal Street
 Andover, MA 01810, USA
 Phone: +1 877 342 5173
 Email: CCC@us.schneider-electric.com



Specification:

PowerPact P-frame Electronic Trip Circuit Breaker
 3-Pole
 800A
 600VAC
 65kA at 240VAC - 35kA at 480VAC - 18kA at 600VAC
 100% Rated
 Micrologic Standard Trip Unit (5.0)
 LSI
 Type A
 0.4A to 1A

Description:
 Number of Poles:
 Sensor Rating:
 Voltage Rating:
 Interrupting Rating:
 Circuit Breaker Rating:
 Electronic Trip Unit:
 Trip Function:
 Installed Rating Plug:
 Rating Plug Range:

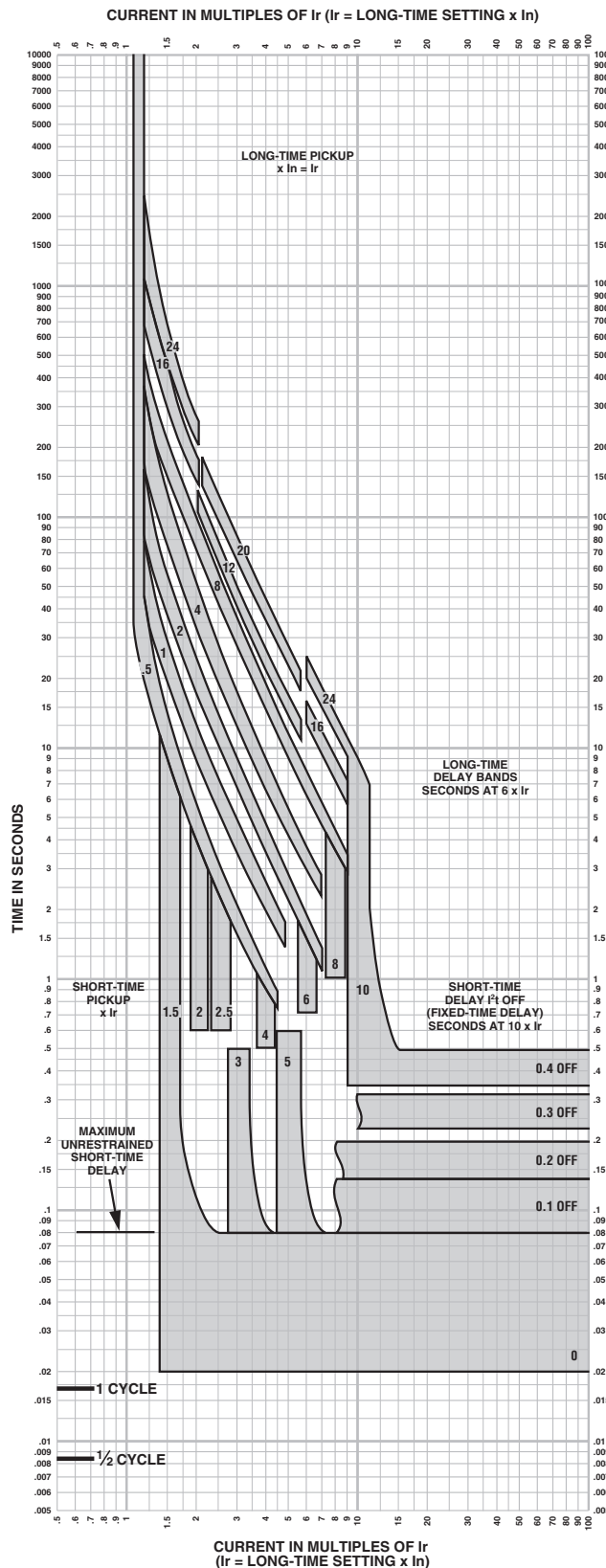
Note:
 - Drawings Not To Scale
 - Drawings Subject to Change Without Notice
 - Dimensions are inches next to [Millimeters]

Technical Information:

Provides overload and short circuit protection
 Panelboards and Switchboards
 UL Listed - CSA Certified - IEC Rated
 Unit Mount
 Lugs (ON and OFF ends)
 #3/0-500 AWG/kcmil(Al/Cu)
 32 Pounds
 8.07 Inches
 12.86 Inches
 8.27 Inches

PowerPact™ M-, P- and R-Frame, and Compact™ NS630b–NS3200 Circuit Breakers

Micrologic 5.0/6.0 P-Frame, R-Frame and NS630b–NS3200 A/P/H Trip Unit Characteristic Trip Curve



Micrologic 5.0/6.0 A/P/H Trip Units Characteristic Trip Curve No. 613-4

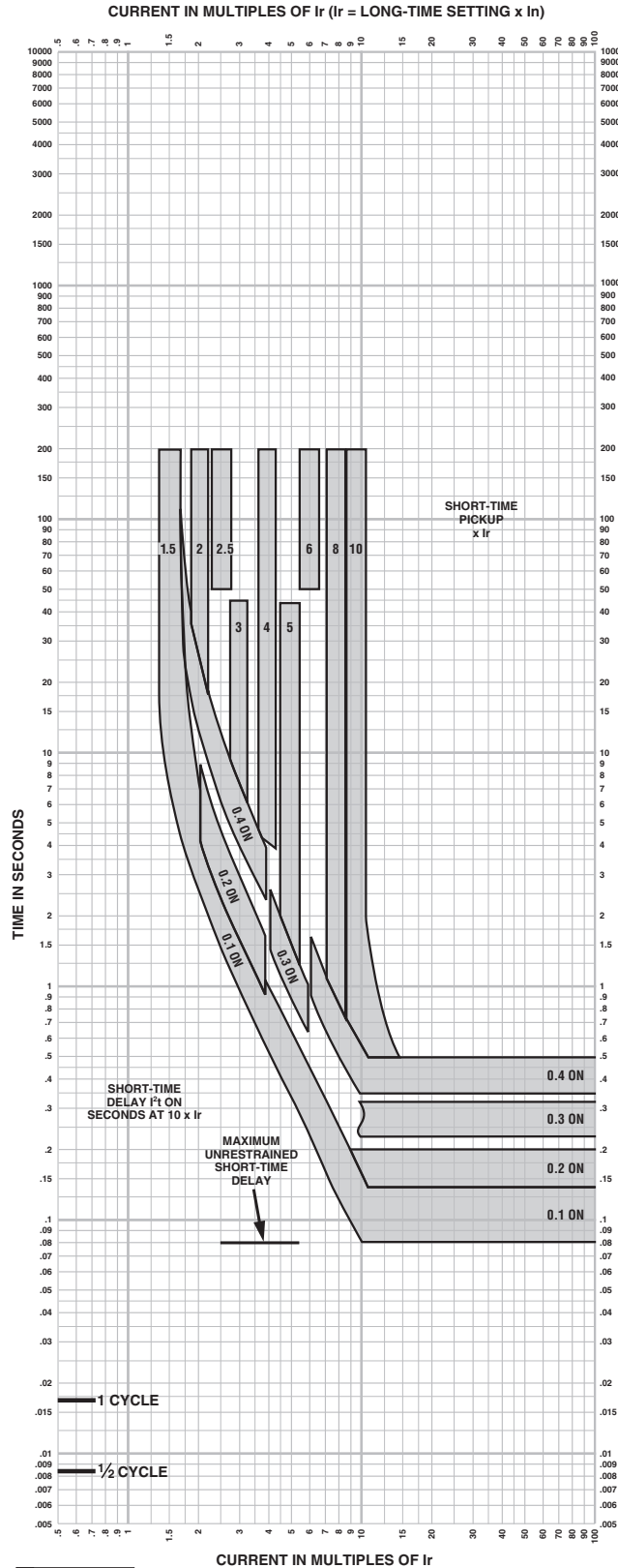
Long-Time Pickup and Delay
Short-Time Pickup and I^2t OFF Delay

The time-current curve information is to be used for application and coordination purposes only. Curves apply from -25°C to $+70^{\circ}\text{C}$ (-13°F to $+158^{\circ}\text{F}$) ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal-imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately twenty minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selective interlocking ON, short-time delay utilized, and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
5. For a withstand circuit breaker, instantaneous can be turned OFF. See trip curve 613-7 on page 178 for instantaneous trip curve. See table on page 182 for instantaneous override values.
6. Overload indicator illuminates at 100%.

Micrologic 5.0/6.0 P-Frame, R-Frame and NS630b–NS3200 A/P/H Trip Units Characteristic Trip Curve



Micrologic 5.0/6.0 A/P/H Trip Units
Characteristic Trip Curve No. 613-5
Short-Time Pickup and I^2t ON Delay

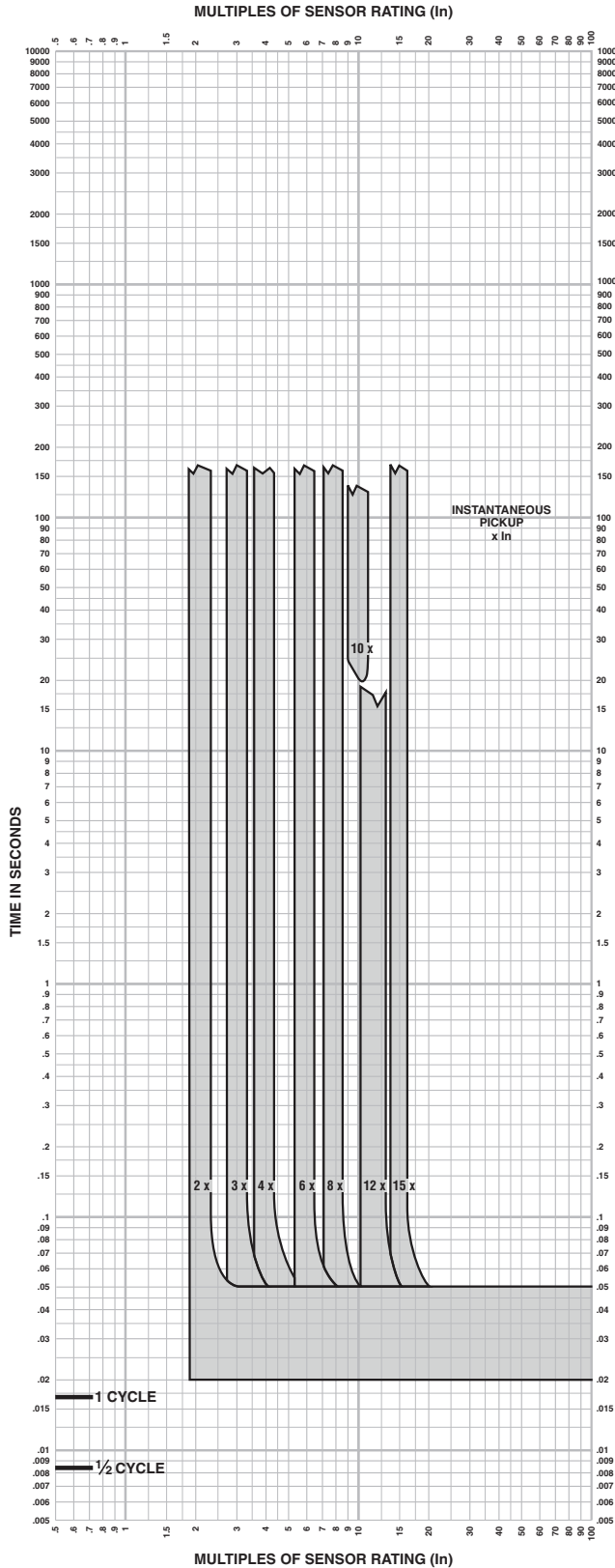
The time-current curve information is to be used for application and coordination purposes only. Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal-imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately twenty minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selective interlocking ON, short-time delay utilized, and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of current.
5. For withstand circuit breaker, instantaneous can be turned OFF. See trip curve 613-7 on page 178 for instantaneous trip curve. See table on page 182 for instantaneous override values.
6. See Trip Curve 613-4 on page 176 for long-time pickup and delay trip curve.

PowerPact™ M-, P- and R-Frame, and Compact™ NS630b–NS3200 Circuit Breakers

Micrologic 5.0/6.0 P-Frame, R-Frame and NS630b–NS3200 A/P/H Trip Units Characteristic Trip Curve



Micrologic 5.0/6.0 Trip Units Characteristic Trip Curve No. 613-7 Instantaneous Pickup, 2X to 15X and OFF

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -30°C to +60°C (-22°F to +140°F) ambient temperature.

Notes:

1. The end of the curve is determined by the interrupting rating of the circuit breaker.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of current.
3. The instantaneous region of the trip curve shows maximum total clearing times. Actual clearing times in this region can vary depending on the circuit breaker mechanism design and other factors. The actual clearing time can be considerably faster than indicated. Contact your local sales office for additional information.
4. For a withstand circuit breaker, instantaneous can be turned OFF. See trip curve 613-7 on page 178 for the instantaneous trip curve. See table on page 182 for the instantaneous override values.
5. See trip curve 613-4 on page 176 and trip curve 613-5 on page 177 for long-time pickup, long-time delay, short-time pickup and short-time delay trip curves.



Enclosure and Sound Data Sheet - Diesel, Open Field

60 Hz: 230-400 kW Standby / 210-250 kW Prime



Level 3 Enclosure (pictured)*

Enclosure Level Identification

Level 1	Skid-mounted weather-protective enclosure constructed of heavy gauge steel or aluminum with fixed stormproof panels designed for 130 mph wind load rating. Enclosure consists of a bolted and welded construction with unit-mounted internal silencer. Hinged, lockable double-door access on both sides of the enclosure with single rear door access.
Level 2	Level 1 enclosure with air exhaust scoop. UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed inside enclosure ceiling and walls.
Level 3	Level 2 enclosure with an additional silencer mounted in the exhaust scoop. UL 94 HF-1 compliant, 1.5" thick sound attenuated foam insulation installed in scoop and inside enclosure ceiling and walls.

CERTIFICATIONS AND STANDARDS

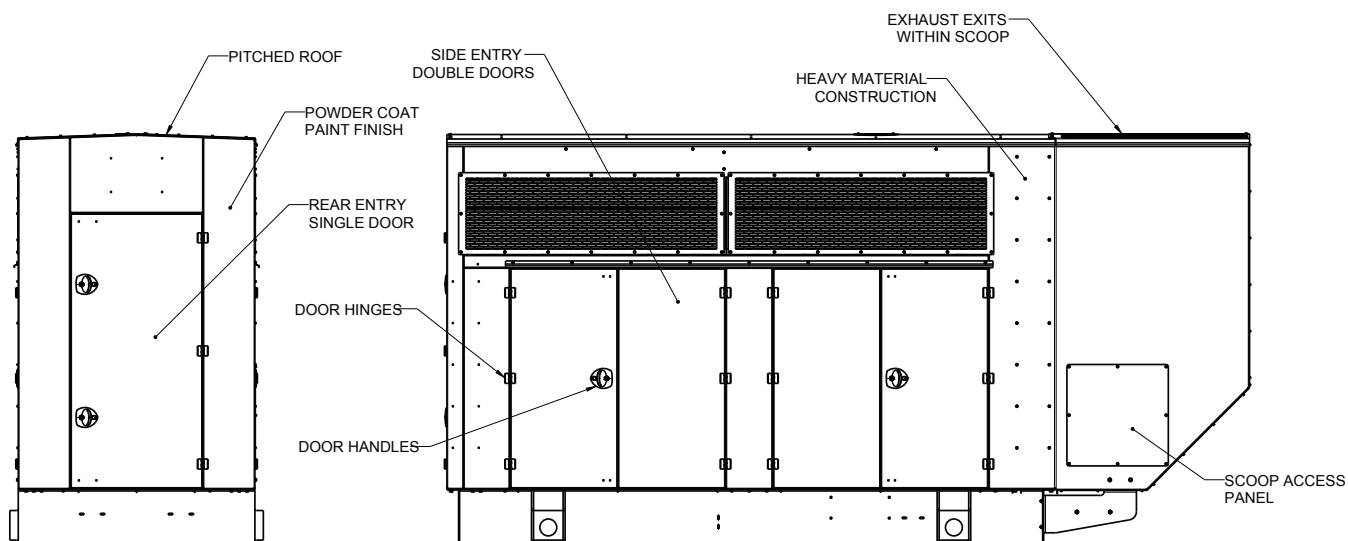
- UL 2200
- CSA C22.2 No. 100
- CSA C22.2 No. 14
- High Velocity Hurricane Zone (HVHZ)
 - Miami Dade NOA
- Florida Building Code
- IBC Wind

Enclosure and Sound Data Sheet - Diesel, Open Field

230-400 kW Standby / 210-250 kW Prime

STANDARD FEATURES FOR ALL LEVELS

- Heavy material construction
 - Steel enclosure: 1.9 mm (0.075 in) - 14 gauge or greater thickness
 - Aluminum enclosure: 2.3 mm (0.09 in) or greater thickness
- 130 mph wind rating
- Service access
 - Double door access gives ease of service to all components
- Pitched roof
- Rain shroud
- Rain cap (Level 1 and Level 3 only)
- Rodent barriers
- Exhaust scoop access panel and drain
- Hardware
 - Powder coated hinges with stainless steel pins
 - Key-lockable and pad-lockable powder coated door handles
- Powder coat finish paint: RAL 7001 Silver Grey standard
 - Custom colors available upon request
- Internal silencer
 - Insulated muffler wrap
 - Stainless steel flexible exhaust connections (where applicable)



Level 3 Enclosure (pictured)*

OPTIONAL FEATURES

- Door restraints
- LED light package
- Motorized / gravity louvers (where available)
- Enclosure space heater
- 195 mph wind rating
- For other custom options, please consult factory

OPTIONAL HIGH VELOCITY HURRICANE ZONE (HVHZ) ENCLOSURE

- TAS 201-94 (impact test procedures)
 - Level E = 9 lbs at 80 ft/sec
- TAS 202-94 (static air pressure)
 - Static testing up to 153 pounds per square foot (psf)
- TAS 203-94 (cyclic pressure loading)
 - Cyclical tests up to ± 126 psf over 671 cycles
- ASTM E72-15 (racking strength test)
- Simulated 195 mph wind at Exposure D
- Meets Florida Building Code (FBC) Section 1626 requirements

Enclosure and Sound Data Sheet - Diesel, Open Field

230-400 kW Standby / 210-250 kW Prime

ENGINE EXHAUST SOUND RATINGS dB(A) AT 1 METER
OPU SOUND RATINGS dB(A) AT 1 METER
ENCLOSURE SOUND RATINGS dB(A) AT 7 METERS

Application	Model	Power Node	1 Meter		7 Meters		
			Engine Exhaust ⁽¹⁾	OPU ⁽²⁾	Level 1	Level 2	Level 3
60 Hz Standby	<i>mtu</i> 6R0150 DS230	230 kW	C/F	99	88.5	80.5	74.1
	<i>mtu</i> 6R0150 DS250	250 kW	C/F	99	88.6	80.1	74.6
	<i>mtu</i> 6R0150 DS275	275 kW	C/F	98.9	88.3	80.6	74.3
	<i>mtu</i> 6R0150 DS300	300 kW		113.1	100.6	90.3	81.9
	<i>mtu</i> 6R0225 DS350 ⁽³⁾	275 kW	C/F	103.3	89.5	80.9	75.6
	<i>mtu</i> 6R0225 DS350 ⁽³⁾	300 kW	C/F	103.1	90.1	81.1	76.2
	<i>mtu</i> 6R0225 DS350	350 kW	C/F	103.9	89.9	81.6	76.5
	<i>mtu</i> 6R0225DS400	400 kW		112.4	104	91	82.1
60 Hz Prime	<i>mtu</i> 6R0150 DS230	210 kW	C/F	98.4	88	79.7	73.9
	<i>mtu</i> 6R0150 DS250	230 kW	C/F	98.9	88.5	80.5	74.1
	<i>mtu</i> 6R0150 DS250	250 kW	C/F	98.9	88.6	80.1	74.6

⁽¹⁾ Undampened engine exhaust noise

⁽²⁾ Measurement with infinite exhaust connection

⁽³⁾ Single-phase units only

NOTE:

- Measurement includes exhaust noise.
- Aluminum enclosure sound levels are approximately 2 dB(A) higher than listed sound levels for steel enclosures.
- For installation within 50 miles of the coast, aluminum enclosures are recommended to prevent accelerated corrosion.
- Sound pressure levels subject to environment, instrumentation, measurement, installation, and generator set variability.
- Generator set is tested on level ground without spring isolators installed.
- Sound power levels per ISO 8528-10 and ANSI S1.13-2005
- Sound data measured with:
 - Full-rated load
 - Standard radiator package

C/F = Consult Factory

* Note: Visual appearance may differ between power nodes.

FUEL SYSTEM

Sub-Base Tank Data Sheet



MTU Onsite Energy's sub-base fuel tanks are manufactured and listed per UL142 and ULC-S601 standards for steel above-ground tanks. These certifications assure that our tanks meet the structural and mechanical integrity requirements for mounting generator sets directly on top, providing our customers with a safe and efficient fuel storage system. These tanks are suitable for above-ground storage of non-corrosive, stable, flammable, or combustible liquids that have a specific gravity not exceeding that of water. They are intended for installation and use in accordance with the codes referenced in the *Certifications and Standards* section. The secondary containment construction consists of a steel tank within a closed steel containment dike that is capable of being monitored for leakage.



STANDARD FEATURES

- Fuel fill drop tube
- Normal vent
- Emergency vent
- Manual fill
- Lockable fill cap
- Level alarm
- Basin drain (plugged)
- Removable supply and return dip tubes
- Leak detection
- Black paint finish
- Secondary containment
- Electrical stub-up area: Provides space for generator set electrical connections and internal wiring capabilities
- Baffles: Separates cold engine supply fuel from hot returning fuel (additional baffling as required for structural integrity)
- Fuel level gauge: A direct-reading fuel level gauge with electric sender

OPTIONAL FEATURES

- High fuel pre-alarm and low fuel level shutdown
- Five-gallon spill/fill containment box with lockable hatch
- Fuel tanks to meet local jurisdictions/codes
- IBC Certification 2006, 2009, and 2012

FUEL SYSTEM

Sub-Base Tank Data Sheet



CERTIFICATIONS AND STANDARDS

United States

- UL 142
- NFPA 30
- NFPA 37
- NFPA 110
- International Fire Code

Canada

- ULC-S601
- Part 4: National Fire Code of Canada
- CSA B139
- CSA C282
- CCME PN 1326

OPTIONAL REGIONAL CODE KITS

MTU Onsite Energy offers pre-engineered kits that can be added to sub-base fuel tanks on 30-600 kW generator sets. These kits meet the regional codes for listed counties and states. Reference the table on page 3 for the contents of each code kit.



Starting System Data Sheet

Commercial Battery

Extra ruggedness and resistance to vibration, heat, chemicals, and physical abuse are built into every commercial battery provided with an *mtu* generator set. The battery design features the latest in power storage technology for lead-acid batteries, as well as incorporates proven designs developed with the most experience in the business.

PRODUCT FEATURES

- **Case Design:** Tough, high-impact reinforced polypropylene case is heat sealed under extreme pressure to withstand heavy commercial service usage. This helps to prevent electrolyte leakage, improves reliability, and reduces breakage.
- **Internal Design:** Full-frame power path grids avoid sharp wires protruding through separators and directs the power straight to the lug for low resistance and higher cranking amps.
- **Terminals:** Standard terminals are solidly built preventing porosity, corrosion, black post, and harmful acid leaks.
- **Power Density:** Extra heavy-duty batteries deliver more cranking amps per pound.
- **Maintenance:** The battery uses pure de-mineralized electrolytes for reduced water loss, reduced gassing, longer battery life, and low maintenance.
- **Reliability:** Narrow ribs reduce separator corrosion to protect against shorts while deep-pocket envelopes dramatically improve reliability and extend service life.
- **Quality:** Over 250 quality control checks, combined with computer-aided design technology, provide a tough, durable battery in each commercial battery provided with an *mtu* generator set.

BCI Group Size	Terminal Type	mtu Part Number	Volt	Cranking Performance CCA (Cold Cranking Amps) -18° C / 0° F	Reserve Capacity	Overall Dimension			
						Length mm (in)	Width mm (in)	Height mm (in)	Weight (Wet) kg (lbs)
						24	Post	SUA102538	12
31	Post	SUA120299	12	950	175	330 (13)	171 (6.75)	241 (9.5)	25.7 (56.5)
4D	Post	SUA102493	12	1,050	290	527 (20.75)	216 (8.5)	258 (10.125)	45.2 (99.5)
8D	Post	SUA102492	12	1,400	430	527 (20.75)	279 (11)	254 (10)	59.3 (130.5)

GENERATOR INFORMATION STATES 24V

EnerGenius® NRG

The Intelligent Battery Charger™



EnerGenius® NRG Benefits

For the first time, your battery charger can warn you before battery system problems threaten your mission-critical application.

The new BatterySENS fault warning system, teamed with extreme charging accuracy, helps prevent the No. 1 problem with generator sets: failure to start. *EnerGenius NRG* is even smart enough to detect installation errors, adjust in the field to different inputs, and prevent “fried” electronics.

EnerGenius® NRG Features

Designed from the ground up for mission-critical reliability

- Precise charging and temperature compensation assure the correct battery charge under all conditions.
- The industry-first BatterySENS feature warns of high resistance battery or connections, so service can be dispatched before engine start is needed.

The charger puts you in control. At any time, select from or change:

- Input: 120, 208 or 240 volts
- Output: 12 or 24 volts nominal (optional)
- Battery type from six standard settings
- Enabled or disabled automatic fast charging
- Enabled or disabled automatic temperature compensation, or installation of optional remote temperature sensor.

Replace nearly any existing charger without planning ahead

- *EnerGenius NRG* is adaptable in the field to different inputs, as well as to battery voltage and type.

Intelligent features prevent installation errors

- *EnerGenius NRG* won't start if the battery is connected backwards, disconnected or the wrong voltage.
- Each fault activates SENS unique “Battery Fault” alarm.

Intelligent design prevents system damage

- Industry-first load-dump protection clamps high voltage transients.
- Class-leading surge suppression provides the best lightning protection available.

Easy field battery upgrades

- In seconds select the new correct battery voltage from six standard settings.

Engineered for top quality and reliability

- Highest possible ISO 9000 quality design and construction
- Finest industrial-grade components available
- UL, C-UL listed
- CE marked (50/60 Hz units)

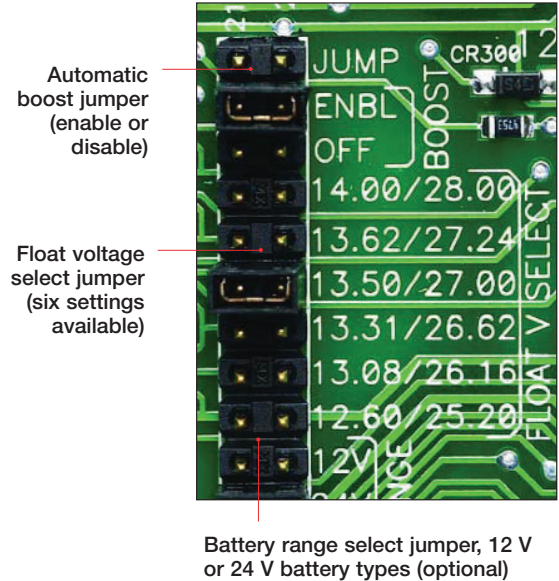


Feature: Configurable to nearly any site

Benefit: Easiest field adjustments for any battery; can replace nearly any charger

Specifications

- 120/208-240 volt AC input selector switch
- 12/24 volt output field programmable (optional)
- 6 discrete battery voltage programs
- Lead-acid 12 or 24-volt
 - Low or high S.G. flooded
 - Low or high S.G. VRLA
- Nickel cadmium
 - 12-volt: 9 or 10 cells
 - 24-volt: 18, 19 or 20 cells
- Enable or disable automatic fast charge
- Enable or disable temperature compensation
- Optional remote temperature sensor
- Dead battery charge feature



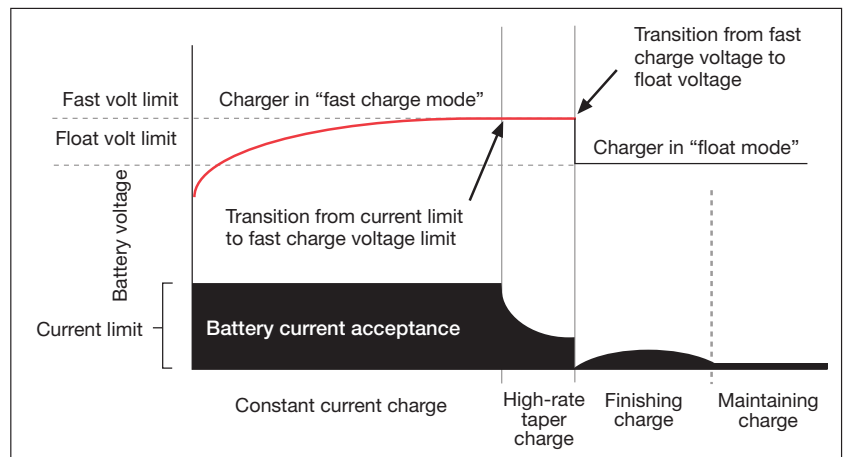
Feature: Highest accuracy charging

Benefit: Best battery performance and longest battery life ensure engine start

Specifications

- 10 or 20 amp output
- Highest accuracy ($\pm 0.5\%$) line and load regulation
- 4-rate fast charge program
- Temperature compensation (enable or disable in field)
- Optional remote temperature sensor

Standard 4-Rate Charging



Feature: Wide range of standard functions

Benefit: Features needed to meet most specifications already engineered in

Feature	Standard	Optional
Single phase input	Field selectable 120/208-240 VAC, 60 Hz	120/208-240 VAC, 50/60 Hz
DC output	12 V output, 24 V output	Field selectable 12/24 V output
Automatic equalize	4-rate charge profile	Standard feature
Temperature compensation	Enable or disable in the field	Remote battery sensor
Circuit card tropicalization	All boards coated	Standard feature
Alarm contacts	Single Form C summary alarm	Individual alarm contacts meeting requirement of NFPA-110
Housing protection	NEMA-1 (IP-20)	Drip shield (IP 22) or NEMA 3R enclosure
Lightning protection	Meets ANSI/EEE and EN standards	Standard feature
C-UL listing to UL 1236	Category BBGQ	Category BBHH: "Emergency Power Systems"
CE marked	Non-standard	Included in 50/60 Hz units

Feature: Comprehensive display and alarm system

Benefit: Gives the most complete system status and diagnostics available. Optional alarm system "C" exceeds NFPA-110 requirements

Specifications

- Digital meter accurate to $\pm 2\%$ voltage and $\pm 5\%$ amperes
- Battery fault alarm indicates any of the following:
 - Battery disconnected
 - Battery polarity reversed
 - Mismatched charger/battery voltage
 - Open charger to battery connection
 - Open battery cell or excessive internal resistance

Alarm System Functions		
	Alarms 1	Alarms C
AC on	LED	LED
Float charge	LED	LED
Fast charge	LED	LED
Temp comp active	LED	LED
AC fail	LED*	LED and Form C contact
Low battery volts		LED and Form C contact
High battery volts		LED and Form C contact
Charger failure	LED*	LED and Form C contact
Battery fault	LED*	LED and Form C contact

* Alarms summed together in a single Form C contact

Feature: Industry-first battery fault warning

Benefit: Helps diagnose battery problems before engine start is needed

Specifications

- Charger issues a battery fault alarm if the battery: Becomes disconnected, fails open circuit, or if internal resistance becomes high



Battery fault warning

Feature: Ruggedized to the toughest specifications

Benefit: Reliable charger stays accurate despite severe real-world conditions to ensure dependable engine starting

Specifications

- Electronic current limit prevents overloads
- BatterySENS protects against reverse or wrong battery voltage
- Operating temperature: -40C to +60C. Meets full specification from -20C to +45C.
- Thermal protection against excessive temperature
- Humidity 5% to 95%, non-condensing
- Conformally coated printed circuit card
- Vibration resistance to UL 991, Class B (10A units only)
- Lightning transient immunity to ANSI/IEEE C62.41 Cat. B and EN 50082-2 heavy industrial

Feature: Safety and EMC compliance

Benefit: Meets USA, Canada and European Union standards. Approved for use with UL 2200 gensets.

Specifications

- C-UL listed to UL 1236
- UL listed in category BBHH for "Emergency Power Systems" (optional)
- Complies with CSA 22.2 no. 107.2-M89
- Meets FCC Part 15, Class B; EN50081-2
- CE marked (50/60 Hz units) to EN 60335
- Input and output fuses
- Complies with NFPA-110 (requires optional alarms "C")



Feature: State-of-the-art mechanical design

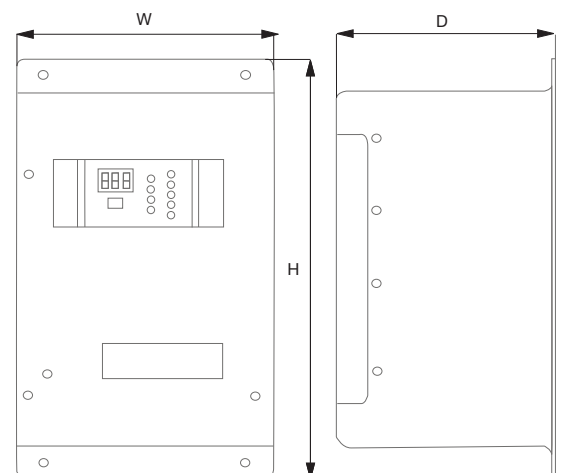
Benefit: Anodized aluminum housing offers cool long-life operation

Specifications

- Natural convection cooling
- Corrosion-resistant housing with conduit knockouts
- Terminal blocks for permanent installation

Housing Dimensions

Amps	Width	Depth	Height
10	7.66" (195 mm)	6.48" (165 mm)	12.50" (318 mm)
20	14.00" (356 mm)	6.73" (171 mm)	12.50" (318 mm)



WATER HEATER

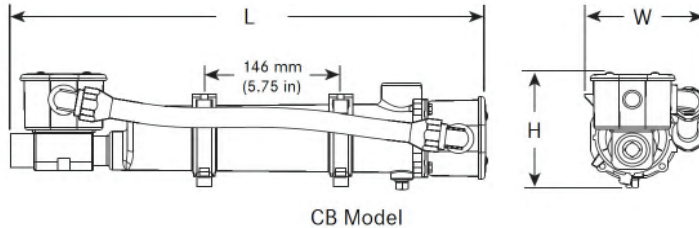
CB, CL, and WL Series Data Sheet



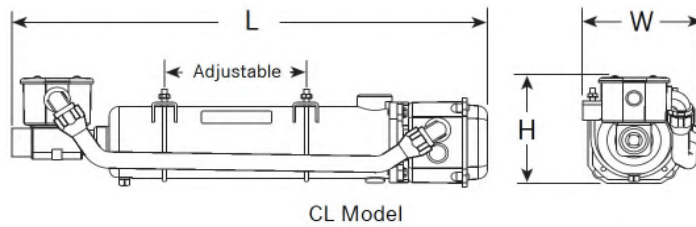
The CB, CL, and WL tank style engine heaters are designed to preheat diesel and gas engines in generator set applications. With easy start-up regardless of ambient temperature, they feature a built-in thermostat and heat engines from 6L to 25L displacement. Thermosiphon circulation of the coolant delivers heat throughout the entire engine for optimum performance.



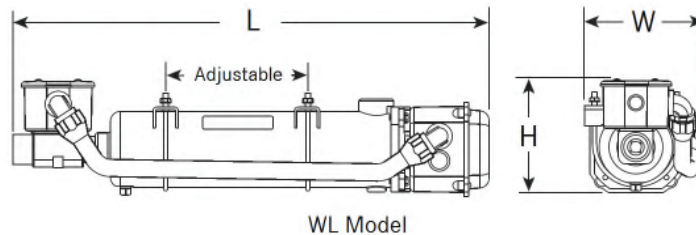
CB Model with thermostat



CL Model with thermostat



WL Model with thermostat



CERTIFICATIONS AND STANDARDS

- CB and CL Models: c-UL-us Listed, CSA Certified, and CE Compliant
- WL Model: CE Compliant

SPECIFICATIONS

	<u>CB Model</u>	<u>CL Model</u>	<u>WL Model</u>
Height:	132 mm (5.2 in)	147 mm (5.8 in)	147 mm (5.8 in)
Length:	510 mm (20.1 in)	597 mm (23.5 in)	597 mm (23.5 in)
Width:	129 mm (5.1 in)	158 mm (6.2 in)	158 mm (6.2 in)
Weight:	3 kg (6.9 lb)	4.5 kg (10 lb)	4.5 kg (10 lb)
Heating Fluid:	Engine coolant (50% glycol/50% water)		
Power:	1.5, 2, 2.5, 3, 4, and 5 kW		
Rated Voltage:	120V – 575V		
Phase:	1 and 3		
Enclosure:	IP44		
Fluid Capacity:			
CL and WL Models	2 L (0.5 gal)		
CB Models	1.2 L (0.3 gal)		

WATER HEATER

CB, CL, and WL Series Data Sheet



SPECIFICATIONS, continued

Max Pressure: 8.61 bar (125 psi)
 Inlet / Outlet: 1" NPT Male / 1" NPT Female
 Thermostat Range:
 On 38 °C (100 °F)
 Off 49 °C (120 °F)

Model Number	MTU Onsite Energy Part Number	Watts	Volts	Phase	Hz	Amps
CB115410-200	SUA98952	1,500	480	1	60	3.1
CB120210-200	SUA98996	2,000	240	1	60	8.3
CB120410-200	SUA98953	2,000	480	1	60	4.2
CB120810-200	SUA98404	2,000	208	1	60	9.6
CB125210-200	SUA96723	2,500	240	1	60	10.4
CB125410-200	SUA90334	2,500	480	1	60	5.2
CB125810-200	SUA96727	2,500	208	1	60	12
CL130410-200	SUA97791	3,000	480	1	60	6.3
CL140210-200	SUA99109	4,000	240	1	60	16.7
CL140410-200	SUA52741	4,000	480	1	60	8.3
CL140810-200	SUA99110	4,000	208	1	60	19.2
CL150210-200	SUA98913	5,000	240	1	60	20.8
CL150212-200	SUA82416	5000	240	1	60	20.8
CL150412-200	SUA83334	5000	480	1	60	10.4
CL150810-200	SUA96725	5,000	208	1	60	24
WL325410-200	SUA96568	2,500	480	3	60	3
WL325810-200	SUA97254	2,500	208	3	60	6.9
WL340410-200	SUA96787	4,000	480	3	60	4.8
WL340810-200	SUA99286	4,000	208	3	60	11.1
WL350410-200	SUA98951	5,000	480	3	60	6
WL350810-200	SUA92800	5,000	208	3	60	13.9

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Air Filter Data Sheet

DESCRIPTION

Air filters offer engine protection and minimal downtime during normal maintenance. The air filters on **mtu** generator sets are easy to install, durable, and reliable.

FEATURES

- Designed to withstand severe intake pulsation and high humidity
- Sturdy, self-supporting, one-piece construction
- Lightweight and compact



SPECIFICATIONS

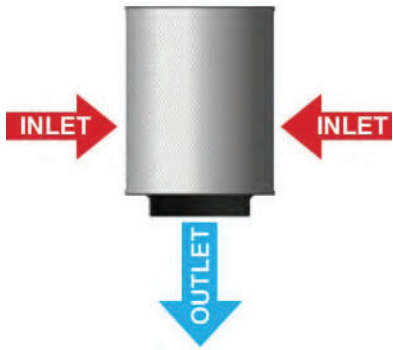
mtu Part #	Airflow @ Inches of Water Restriction (refer to <i>Airflow Diagrams</i> below)			Weight kg (lb)	Maximum Temp	
	m ³ /min (SCFM) @ 4 in. H ₂ O	m ³ /min (SCFM) @ 6 in. H ₂ O	m ³ /min (SCFM) @ 8 in. H ₂ O		Continuous °C (°F)	Intermittent °C (°F)
SUA106417	4.3 (150)	5.1 (180)	6.1 (215)	1 (2.2)	83 (180)	105 (220)
SUA90069	43.9 (1,550)	52 (1,836)	60 (2,118)	3.6 (8)	83 (180)	105 (220)
SUA86885	13.7 (485)	17.6 (620)	21.5 (760)	2.6 (5.8)	83 (180)	105 (220)
SUA77166	3.8 (135)	4.6 (163)	5.3 (190)	1.3 (2.9)	N/A	N/A
SUA40198	3.1 (112)	4.1 (145)	4.8 (170)	0.64 (1.4)	83 (180)	105 (220)
XG3012100019	23.5 (830)	31.43 (1,110)	36.67 (1,295)	1.45 (3.2)	83 (180)	105 (220)
XG2112100001	9.63 (340)	13.03 (460)	15.85 (560)	1.59 (3.5)	N/A	N/A
XG2512100002						

mtu Part #	Dimensions (refer to <i>Dimension Diagrams</i> on next page)				Minimum Removal Clearance mm (in)
	Body Length (D) mm (in)	Body Diameter (A) mm (in)	Outlet Length (F) mm (in)	Outlet Diameter (C) mm (in)	
SUA106417	127 (5)	216 (8.5)	35 (1.38)	76 (3)	38.1 (1.5)
SUA90069	400 (15.75)	318 (12.5)	48 (1.89)	198 (7.8)	38.1 (1.5)
SUA86885	279 (11)	318 (12.5)	35 (1.38)	127 (5)	38.1 (1.5)
SUA77166	172 (6.75)	216 (8.5)	27 (1.08)	75 (2.96)	38.1 (1.5)
SUA40198	102 (4)	216 (8.5)	35 (1.38)	64 (2.5)	38.1 (1.5)
XG3012100019	381 (15)	318 (12.5)	35 (1.38)	152 (6)	38.1 (1.5)
XG2112100001	267 (10.5)	267 (10.5)	35 (1.38)	102 (4)	38.1 (1.5)
XG2512100002					

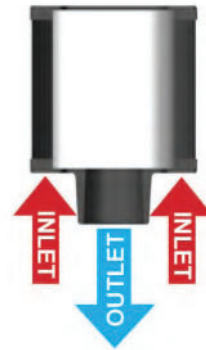
N/A = Not Available

Air Filters Data Sheet

AIRFLOW DIAGRAMS



Airflow Diagram: SUA90069,
XG3012100019

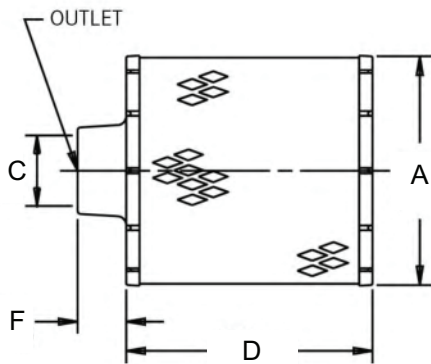


Airflow Diagram: SUA106417,
SUA86885, SUA77166, SUA40198

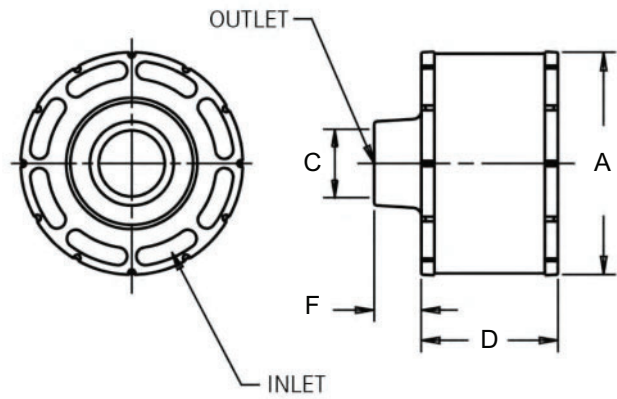


Airflow Diagram: XG2112100001,
XG2512100002

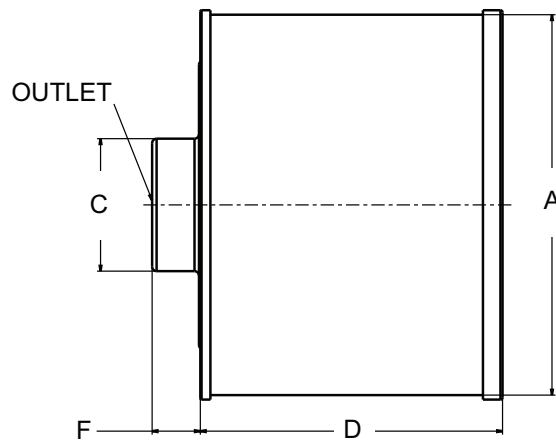
DIMENSION DIAGRAMS



Dimension Diagram: SUA90069, XG3012100019



Dimension Diagram: SUA106417, SUA86885, SUA40198



Dimension Diagram: SUA77166, XG2112100001, XG2512100002



Isolator Pad Data Sheet

DESCRIPTION

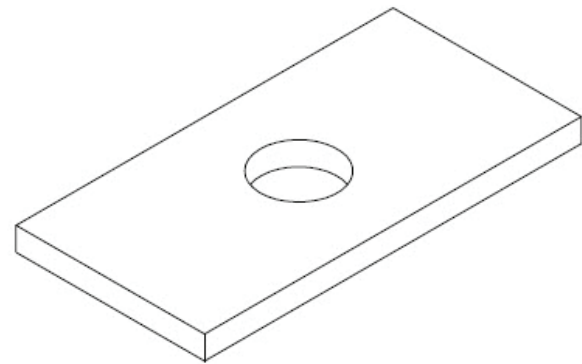
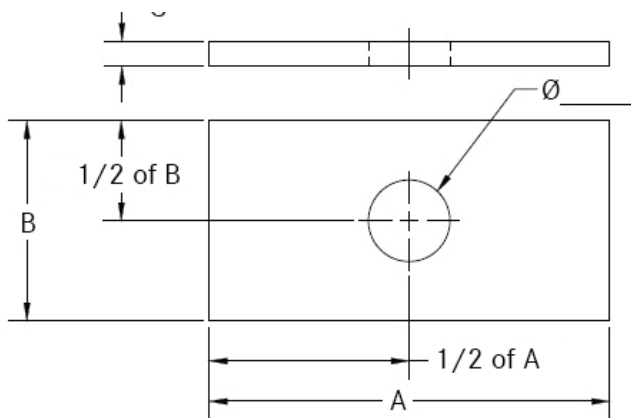
These square-molded, neoprene pads can be used to compensate for inconsistencies in the mounting surface between the generator set base frame and the installation surface, or between the sub-base fuel tank and the installation surface, if applicable. They can be easily cut to any desired shape and can be used in multiple layers to increase deflection.

NEOPRENE TYPICAL PHYSICAL PROPERTIES

Hardness: 40A-90A
 Tensile Strength: 500
 Elongation: 200
 Tear Value: 50
 Thermal Conductivity (K Factor): 0.30

Heat Resistance @ 100 °C (212 °F) after 70 Hours:

Change in Hardness: 10
 Change in Tensile: -16%
 Change in Elongation: -60%
 Compression Set: 50%
 Lowest Working Temperature: -40 °C (-40 °F)
 Highest Working Temperature: 90.6 °C (195 °F)



mtu Part Number	Dim. A mm (in)	Dim. B mm (in)	Dim. C mm (in)	Hole Diameter mm (in)	Durometer
SUA46904	101.6 (4)	50.8 (2)	6.35 (0.25)	20.638 (0.813)	50
SUA46905	152.4 (6)	50.8 (2)	6.35 (0.25)	20.638 (0.813)	50
SUA46906	254 (10)	50.8 (2)	6.35 (0.25)	20.638 (0.813)	50
SUA46907	457.2 (18)	63.5 (2.5)	6.35 (0.25)	20.638 (0.813)	50
SUA46908	457.2 (18)	76.2 (3)	6.35 (0.25)	20.638 (0.813)	50
SUA46909	457.2 (18)	457.2 (18)	6.35 (0.25)	Not Required	50
SUA63015	203.2 (8)	76.2 (3)	6.35 (0.25)	20.638 (0.813)	50
SUA77843	101.6 (4)	50.8 (2)	19.05 (0.75)	20.638 (0.813)	60
SUA86147	457.2 (18)	76.2 (3)	6.35 (0.25)	20.638 (0.813)	70
SUA95672	304.8 (12)	50.8 (2)	6.35 (0.25)	20.638 (0.813)	50
SUA102408	457.2 (18)	76.2 (3)	6.35 (0.25)	26 (1.024)	50
X54599100330	381 (15)	76.2 (3)	6.35 (0.25)	22.225 (0.875)	50

Subject to change. | WT00038043 | 2021-10



ASCO Power Technologies™

ASCO SERIES 300 Power Transfer Switches

NOT REVIEWED. PREVIOUSLY SUBMITTED.

ascopower.com

Life Is On

Schneider
Electric



24-hour protection, no matter when trouble strikes

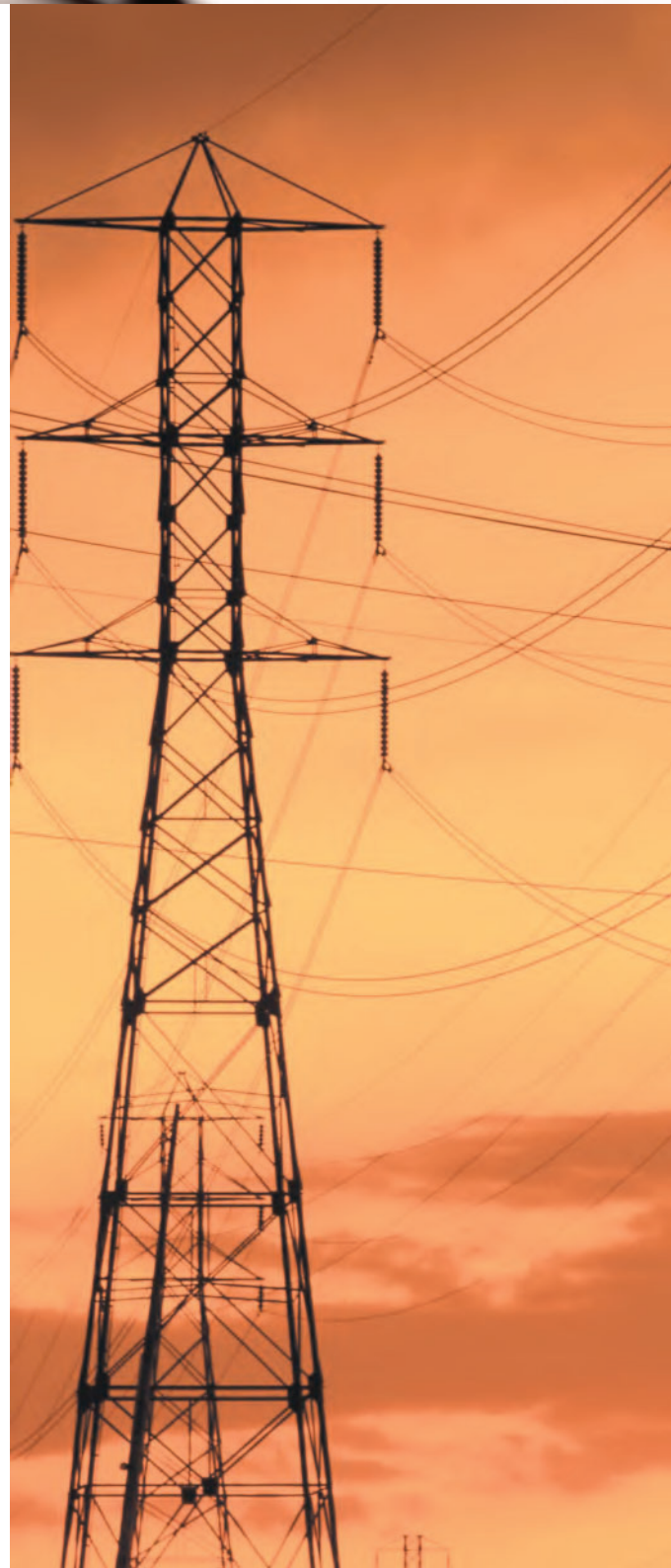
ASCO SERIES 300 Power Transfer Switches for Power Outage Protection

Where would you be without a constant flow of electrical power? We often take for granted that power will always be around when we need it.

In reality, power failures are common, and when the power goes out, your business suffers. Power failures are unpredictable. They can occur at any time and for any number of reasons — a bolt of lightning, a power surge, a blackout, an accident or even equipment failure. They come without warning and often at the most inconvenient times.

It's for this reason that many businesses and other entities have invested in emergency power backup systems. Typically, the system consists of an engine generator and an automatic transfer switch (ATS) that transfers the load from the utility to the generator.

An ATS with built-in control logic monitors your normal power supply and senses interruptions and unacceptable abnormalities. When the utility power fails, the ATS automatically starts the engine generator and transfers the load after the generator has reached proper voltage and frequency. This happens in a matter of seconds after the power failure occurs. When the utility power has been restored, the ATS will automatically switch the load back and, after a time delay, shut down the engine generator. With an ATS, you are protected 24 hours a day, seven days a week.





TYPICAL APPLICATIONS

TELECOM

In the telecommunication industry, providing a high level of service and dependability is crucial. Lost power means an interruption in service for your customers and lost business for your company. For instance, with cell sites scattered across a wide geographical region and in many remote areas, the chances of an interruption in power are increased, making an ATS valuable resource at each location.

To maintain dependable service, each cell site must be monitored 24 hours a day. This can be very difficult without some type of remote monitoring and testing capability. The SERIES 300 Transfer Switch, combined with ASCO's monitoring and control management system, is a cost-effective, packaged solution that can achieve both of these challenging objectives without a major investment at each cell site. With ASCO's connectivity solutions, you can remotely monitor and control numerous sites from around the corner or across the world.

AGRICULTURE

Maintaining electrical power is vital to an agriculture operation. If the flow of power is interrupted, your operation will be at risk unless the backup generator is quickly activated. A prolonged power outage can affect numerous aspects of the operation, from housing and feeding livestock to processing and producing the end product.

With an ASCO SERIES 300 Transfer Switch, power will automatically be transferred over to your backup generator, eliminating the need to manually switch from utility to generator. When power is restored, the ASCO SERIES 300 Transfer Switch will, after an adjustable time delay to allow for utility stabilization, automatically switch the load back to the utility service.

COMMERCIAL/RETAIL, LIGHT INDUSTRIAL

The retail industry is very competitive. An electrical power failure can have a dramatic impact on a retailer's bottom line. If power is interrupted during peak shopping times, the effect can be extremely damaging to present and future business.

A power interruption will not only suspend shopping, it can also create safety problems, result in lost transaction data, lost account information and possible damage to data collection equipment. In addition, retailers who rely on controlled climates to protect valuable inventory could suffer even greater losses, especially if the power failure occurs at a time when no one is available to rectify the situation. To avoid any of these power outage problems, simply install a backup generator with an ASCO SERIES 300 Transfer Switch, and your power outage concerns will be a thing of the past.

MUNICIPAL

The ASCO SERIES 300 Transfer Switch can be a critical component of a municipal government's emergency power backup system. Residents of townships, cities and counties rely on police, fire, ambulance/first aid and other critical public sector services.

An interruption in power can affect the ability of emergency services to effectively respond to the needs of the community. When time is a critical factor, such as when responding to a fire alarm or an emergency call, an ASCO SERIES 300 Transfer Switch can be a lifesaver, by automatically switching to power from the backup generator. While not all municipal services are a matter of life and death, they are always expected to be there.

SERIES 300 POWER TRANSFER SWITCHES

MAXIMUM RELIABILITY & EXCELLENT VALUE

With a SERIES 300 Transfer Switch, you get a product backed by ASCO Power Technologies, the industry leader responsible for virtually every major technological advance in the Transfer Switch industry.

The ASCO SERIES 300 was designed for one purpose—to automatically transfer critical loads in the event of a power outage. Each and every standard component was designed by ASCO engineers for this purpose.

The SERIES 300 incorporates the Group G controller with enhanced capabilities for dependable operation in any environment. A user-friendly control interface with a 128x64 graphical LCD display and intuitive symbols allow for ease of operation while visual LED indicators display the transfer switch status. Operating parameters and feature settings can be adjusted without opening the enclosure door.

The rugged construction and proven performance of the ASCO SERIES 300 assure the user of many years of complete reliability. The SERIES 300 is even designed to handle the extraordinary demands placed on the switch when switching stalled motors and high inrush loads.

ASCO's SERIES 300 modular, compact design makes it easy to install, inspect and maintain. All parts are accessible from the front so switch contacts can be easily inspected.

FEATURES

- The SERIES 300 is listed to UL 1008 standard for total system loads for automatic transfer switches.
- Meets NFPA 110 for Emergency and Standby Power Systems and the National Electrical Code (NEC) Articles 700, 701 and 702.

UL 1008 WITHSTAND AND CLOSE-ON RATINGS FOR ASCO SERIES 300 GROUP G PRODUCTS^{1,2} (RMS Symmetrical Amperes)

FRAME	SWITCH RATINGS (AMPERES)	CURRENT LIMITING FUSES				SPECIFIC BREAKER			
		TRANSFER SWITCHES	480V MAX.	600V MAX.	MAX. SIZE, A	CLASS	240V MAX.	480V MAX.	600V MAX.
D	30		100kA	-	60	J	22kA	22kA	10kA
D	70-104		35kA	35kA	200	RK1	42kA	22kA	10kA
			200kA	35kA	200	J			
D	150		35kA	35kA	200	RK1	65kA	25kA	10kA
			200kA	35kA	200	J			
D	200		200kA	-	200	J	65kA	25kA	10kA
D	230		100kA	-	300	J	65kA	25kA	10kA
J	150 ⁴ , 200 ⁴ , 230 ⁴ , 260, 400		200kA	200kA	600	J	50kA	50kA	42kA
J	600		200kA	200kA	800	L	50kA	50kA	42kA
H	800-1200		200kA	200kA	1600	L	65kA ³	65kA	65kA
G	1600-2000 ³		200kA	200kA	2500	L	85kA	85kA ³	85kA ³
G	2600-3000		200kA	200kA	4000	L	100kA	100kA	100kA

Notes:

1. All WCR values indicated are tested in accordance with the requirements of UL 1008, 7th Edition. See ASCO Pub. 1128 for more WCR information.
2. Application requirements may permit higher WCR for certain switch sizes.
3. Front connected only.
4. J 150, 200, 230 Amperes available in 3ADTS and 3NDTS only.



Fig. 1: ASCO Power Transfer Switch rated 200 Amps

- Restriction of Hazardous Substances (RoHS) compliant controller.
- 30 through 3000 amperes in a compact design.
- Switch operating temperature range of 0 to +40^o C.
- Available to 600 VAC, single or three phase.
- True double-throw operation: The single solenoid design is inherently inter-locked and prevents connections to both sources at the same time.
- No danger of the SERIES 300 ATS transferring loads to a dead source because the unique ASCO single-solenoid operator derives power to operate from the source to which the load is being transferred.
- Easy-to-navigate 128x64 graphical LCD display with keypad provides LED indicators for switch position, source availability, not in auto mode, and alert condition.
- Integrated multilingual user interface for configuration and monitoring.
- Delayed transition operation is now available (Dual Operator Configuration).
- Non-automatic operation can be selected using the key pad without opening enclosure door.
- Relay expansion module with extra relays for accessory outputs (optional).
- Includes soft keys for test function and time delay bypass as standard features.
- Emergency source failure alert indication.
- Historical event log (optional).
- Statistical ATS system monitoring information.
- Diagnostic functions.
- Password protection to prevent unauthorized tampering of settings.
- Adjustable time-delay feature prevents switch from being activated due to momentary utility power outages and generator dips.
- Auxiliary contacts to indicate position of main contacts. Two (2) for normal and two (2) emergency position
- Supplied with solid neutral termination.
- Optional switched neutral pole available.
- Field modification accessory kits available.
- Available for immediate delivery.

SERIES 300 POWER TRANSFER SWITCHES

DESIGNED TO FIT ANYWHERE

The ASCO SERIES 300 product line represents the most compact design of automatic power transfer switches in the industry. With space in electrical closets being at a premium, the use of wall- or floor-mounted ASCO Power Transfer Switches assure designers optimum utilization of space.

All transfer switches through 2000 amperes are designed to be completely front accessible. This permits the enclosures to be installed flush against the wall and still allow installation of all power cabling and connections from the front of the switch. Cable entrance plates are also standard on the 1600 and 2000 amperes units to install optional side-mounted pull boxes for additional cable bending space.



Fig. 2: ASCO Power Transfer Switch rated 200 Amps



Fig. 3: ASCO Power Transfer Switch rated 400 Amps



Fig. 4: ASCO Power Transfer Switch rated 600 Amps



Fig. 5: ASCO Power Transfer Switch rated 1000 Amps



Fig. 6: ASCO Power Transfer Switch rated 2000 Amps shown in Type 3R enclosure



Fig. 7: ASCO Power Transfer Switch rated 3000 Amps

SERIES 300 GROUP G CONTROLLER

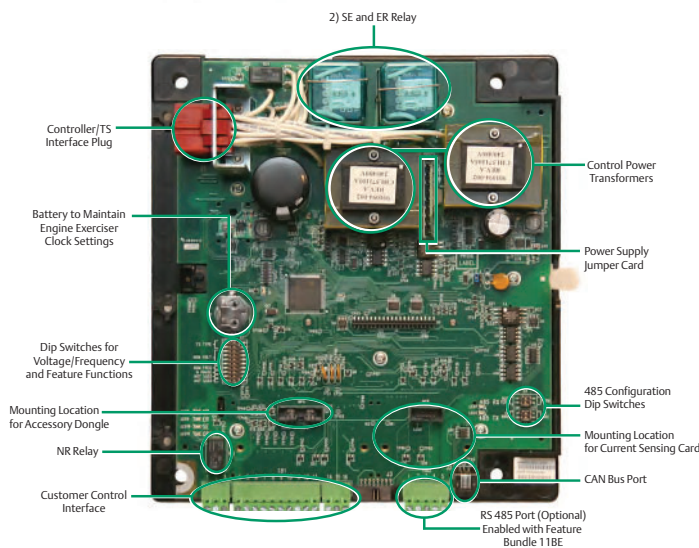


Fig. 8: ASCO SERIES 300 Group G Controller

CONTROL AND DISPLAY PANEL

- Easy-to-navigate 128x64 graphical LCD display with keypad provides LED indicators for switch position, source availability, not in auto mode, and alert condition. It also includes test and time delay bypass soft keys.

VOLTAGE, FREQUENCY & CURRENT SENSING

- 3-phase under and over voltage settings on normal and single phase sensing on emergency source.
- Under and over frequency settings on normal and emergency.
- True RMS voltage sensing with +/-1% accuracy.
- Frequency sensing accuracy is +/- 0.1Hz.
- Voltage and frequency parameters adjustable in 1% increments.
- Selecting settings: single or three-phase voltage sensing on normal, and single phase sensing on emergency; 50 or 60Hz. 3-phase voltage unbalance on normal.
- Load current sensing card (optional).

The SERIES 300 incorporates the group “G” controller with enhanced capabilities for dependable operation in any environment.

TIME DELAYS

- Engine start time delay – delays engine starting signal to override momentary normal source outages, adjustable from 0 to 6 seconds (Feature 1C).
- Emergency source stabilization time delay to ignore momentary transients during initial generator set loading, adjustable from 0 to 4 seconds (Feature 1F).
- Re-transfer to normal time delay with two settings (Feature 3A).
 - Power failure mode – 0 to 60 minutes
 - Test mode – 0 to 10 hours
- Unloaded running time delay for engine cooldown, adjustable from 0 to 60 minutes (Feature 2E).
- Pre- and post-signal time delay for selective load disconnect with a programmable bypass on source failures, adjustable from 0 to 5 minutes (specify ASCO optional accessory 31Z).
- Optional fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without loads, on a daily, weekly, bi-weekly or monthly basis (specify ASCO optional accessory feature bundle 11BE).
- Delayed transition load disconnect time delay, adjustable from 0 to 5 minutes (3ADTS/3NDTS configuration only).

STANDARD SELECTABLE FEATURES

- Inphase monitor to transfer motor loads, without any intentional off time, to prevent inrush currents from exceeding normal starting levels.
- Engine exerciser to automatically test backup generator each week, with or without load 20 minutes not adjustable.
- Commit to transfer.
- Selective load disconnect circuit to provide a pre-transfer and/or post-transfer signal when transferring from emergency to normal and/or normal to emergency.
- Re-transfer to normal through soft keys on user interface permits selection of “manual” or “automatic” operation.
- 60Hz or 50Hz selectable switch. Three-/single- phase selectable switch.

REMOTE CONTROL FEATURES

- External inputs for connecting:
 - Remote test switch.
 - Remote contact for test or peak shaving applications. If emergency source fails, switch will automatically transfer back to normal source if acceptable.
 - Inhibit transfer to emergency.
 - Remote time delay bypass switch emergency to normal.

SERIES 300 GROUP G OFFERS SOPHISTICATED FUNCTIONALITY

The new Group G controller offers an intuitive, easy-to-navigate 128*64 graphical LCD display with soft keypad and provides six (6) LED indicators.

- Switch Position (green for normal, red for emergency LED)
- Source Availability (green for normal, red for emergency LED)
- “Not In Auto” (amber LED)
- Common Alarm (amber LED)

The ASCO group “G” controller is self-contained with an integrated display (no other components are required for efficient operation).

The controller allows for open or delayed transition transfer operation (both automatic, and non-automatic configurations).

An integrated multilingual user interface for configuration and monitoring (this design approach allows greater application flexibility).

Multiple source-sensing capabilities of voltage, frequency (under frequency sensing on normal and emergency sources), and optional current card, single and three phase (does not require an external metering device).

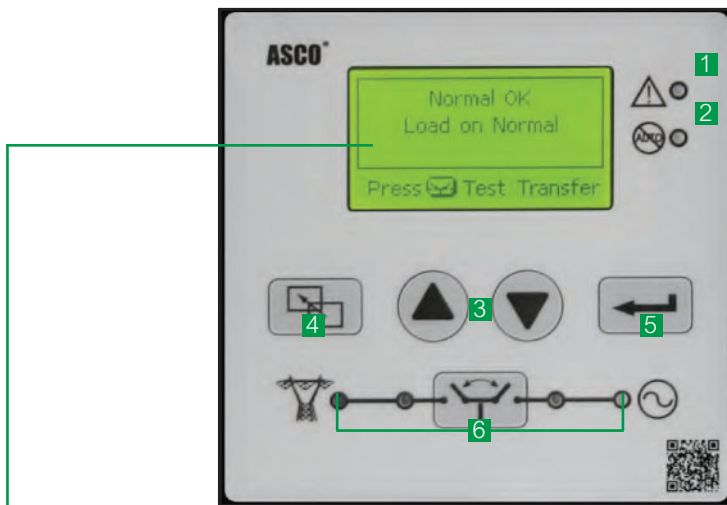


Fig. 9: Door-Mounted Control & Display Panel

- 1 Common Alarm
- 2 Not In Auto Indicator
- 3 Scroll, Up/Down Arrows
- 4 Escape Key
- 5 Enter Key
- 6 LED Source Availability and Switch Position Indicators Transfer / Time Delay Override control push-button

<p>Control Status</p>	<p>Source Status</p> <table border="1"> <tr> <th>Normal</th> <th>Emergency</th> </tr> <tr> <td>V_a 207V</td> <td>V_a 207V</td> </tr> <tr> <td>V_b 206V</td> <td>V_b 207V</td> </tr> <tr> <td>V_c 207V</td> <td>V_c 207V</td> </tr> <tr> <td>60.0Hz</td> <td>60.0Hz</td> </tr> </table>	Normal	Emergency	V _a 207V	V _a 207V	V _b 206V	V _b 207V	V _c 207V	V _c 207V	60.0Hz	60.0Hz	<p>Alarm Status</p>	<p>Controller Information</p>
Normal	Emergency												
V _a 207V	V _a 207V												
V _b 206V	V _b 207V												
V _c 207V	V _c 207V												
60.0Hz	60.0Hz												
<p>Main Menu/ Settings</p>	<p>Settings/ Engine Exerciser</p>	<p>Settings/General/ Communications</p>	<p>Settings/General/ Common Alarms</p>										
<p>Main Menu/ Event Logging</p>	<p>Main Menu/ Statistics</p>	<p>Main Menu/ Factory/Diagnostics</p>	<p>Main Menu/ About</p>										

SERIES 300 ATS OPTIONAL ACCESSORIES

ACCESSORY 1UP

UPS back up power to allow controller to run with LCD display for 30 seconds without AC power.

ACCESSORY 11BE FEATURE BUNDLE

A fully programmable engine exerciser with seven independent routines to exercise the engine generator with or without loads, on a daily, weekly, bi-weekly or monthly basis. Engine exerciser setting can be displayed and changed from the user interface keypad.

Event Log display shows the event number, time and date of event, event type, and event reason (if applicable).

A maximum of 300 events can be stored. RS 485 Communications Port Enabled Common Alarm Output Contact

ACCESSORY 18RX

Relay expansion module (REX) provides for some commonly used accessory relays, includes one form C contact for source availability of normal (18G), and one form C contact for availability of emergency (18B) (contact rating 5 amperes @ 30Vdc or @125 VAC resistive) (100 ma, 5Vdc min). Additional output relay is provided, the default is to indicate a common alarm. (See operator's manual for configurable options.)

ACCESSORY 23GA¹ (SINGLE PHASE) AND 23GB (THREE PHASE)

Load current metering card measures either single or three phase load current.

Note 1: This feature is not available with a Power Meter Option (135L).

ACCESSORY 44A

Strip Heater with thermostat for extremely cold areas to prevent condensation and freezing of this condensation. External 120 volt power source required.

ACCESSORY 44G

Strip Heater with thermostat, wired to load terminals: 208-240, 360-380, 460-480, 550-600 volts. Contains wiring harnesses for all transfer switch sizes.

ACCESSORY 72EE

Connectivity Module enabling remote monitoring and control capabilities includes accessory 11BE featured bundle (pages 12-14).

FIELD CONVERSION KITS FOR SERIES 300 TRANSFER SWITCHES

KIT NO.	DESCRIPTION
935147	Feature Bundle Includes Engine Exerciser/Event Log/RS 485/ Common Alarm Output Contact (Acc. 11BE) Dongle
935148	REX Module with Source Availability Contacts (Acc. 18RX)
935149	UPS to allow controller to run for 30 seconds minimum without AC Power (Acc. 1UP)
935150	1/3 Phase load current sensing card only (Acc. 23GA/GB)
K613127-001	Strip Heater (125 watt) 120 volt (Acc. 44A)
K613127-002	Strip Heater (125 watt) 208-480 volt (Acc. 44G)
948551	Quad-Ethernet Module (Acc. 72EE)
K609027	Cable Pull Box (1600-2000 amperes)

ACCESSORY 73

Surge Suppressor (TVSS) Rated 65kA.

ACCESSORY 62W

Audible alarm with silencing feature to signal each time switch transfers to emergency (may require oversize enclosure depending on accessory combination for "D" frame only).

ACCESSORY 37B

6' Extension harness for units shipped open type to accommodate customer mounting of controls and switch.

ACCESSORY 37C

9' Extension harness for units shipped open type to accommodate customer mounting of controls and switch.

ACCESSORY 135L²

Power Meter on load side (includes shorting block and CTs)Note 2: This feature is not available with Load Current Metering Option (23GA or 23GB).

ACCESSORY 30A³

Shedding circuit initiated by opening of a customer-supplied contact.

ACCESSORY 30B*³

Load-shedding circuit initiated by removal of customer-supplied voltage. (*Specify Voltage)

ACCESSORY 30AA³

Load-shedding circuit initiated by opening of a customer-supplied contact.

ACCESSORY 30BA*³

Load-shedding circuit initiated by removal of customer-supplied voltage. (*Specify Voltage)

Note 3: Accessory 30A and 30B* are only available for 3ATS only; accessory 30AA and 30BA* are only available for 3ADTS.



Fig. 10: Strip Heater Kit (Accessory 44G)



Fig. 11: Relay Expansion Module (Accessory 18RX)

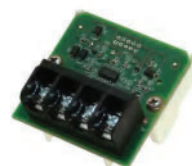


Fig. 12: Load Current Card (Accessory 23GA/GB)

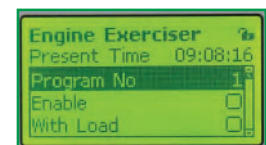


Fig. 13: Programmable Engine Exerciser



Fig. 14: Accessory 1UP UPS Backup Power

SERIES 300 POWER TRANSFER SWITCHES

SERIES 300 NON-AUTOMATIC TRANSFER SWITCHING (3NTS)

ASCO non-automatic transfer switches are generally used in applications in which operating personnel are available and the load is not an emergency type requiring automatic transfer of power. They can also be arranged for remote control via ASCO's connectivity products.



Fig. 15: ASCO 3NTS 400 Amps
Type 1 Enclosure

3NTS FEATURES

- ASCO Non-Automatic Transfer Switches are manually initiated via soft keys on the user interface panel.
- Sizes range from 30 through 3000 amperes.
- Group G controller provides for addition of optional accessories.
- Controller prevents inadvertent operation under low voltage condition.
- Source acceptability lights inform operator if sources are available to accept load.
- Source inphase monitor to transfer motor loads between live sources.
- Two auxiliary contacts closed when transfer switch is connected to normal and two closed on emergency standard feature 14AA/14BA.



Fig. 16: ASCO 3ADTS/3NDTS 400
Amps
Type 1 Enclosure

SERIES 300 DELAYED TRANSITION TRANSFER SWITCHING (3ADTS/3NDTS)

ASCO Delayed Transition Transfer Switches are designed to provide transfer of loads between power sources with a timed load disconnect position for an adjustable period of time.

3ADTS/3NDTS FEATURES

- Sizes from 150 through 3000 amperes.
- Reliable field proven dual solenoid operating mechanisms.
- Mechanical interlocks to prevent direct connection of both sources.
- Adjustable time delay for load disconnect (0 to 5 minutes).
- Available in manual operation configuration (3NDTS).
- Available with optional load shed feature for (3ADTS).

SERIES 300 TRANSFER SWITCH ORDERING INFORMATION

To order an ASCO SERIES 300 Power Transfer Switch, complete the following catalog number: **G3ATS31600NGC**

J	+	03ATS	+	A	+	3	+	0600	+	N	+	GX	+	C
Frame	Transition Type		Neutral Code		Phase Poles	Amperes	Voltage Code	Group Code	Enclosure					
Open Transition D = 30A - 230A	Automatic 03ATS Open Transition		A = Solid Neutral B = Switched Neutral		2	0030 ¹	A ³ = 115	G0 No Optional Accessories	0 = Open Type (zero) C = Type 1 Enclosure					
					3	0070 ¹ 0104 ¹	B ³ = 120 C = 208							
Open/Delayed Transition J = 150A - 600A H = 800A - 1200A G = 1600A - 3000A	3ADTS Delayed Transition					0150 ^{1, 5}	D = 220	GX Optional Accessories	F = Type 3R ¹ Enclosure G = Type 4 ¹ Enclosure H = Type 4X ¹ Enclosure (304 Stainless Steel) L = Type 12 ¹ Enclosure M = Type 3R ³ Secure Double Door Enclosure N = Type 4 Secure Double Door Enclosure Q = Type 12 Secure Double Door Enclosure R = Type 3RX ^{7, 8} Secure Double Door Enclosure (304 Stainless Steel)					
	Non Automatic 03NTS Open Transition					0200 ^{1, 3, 4}	E = 230							
	3NDTS Delayed Transition					0230 ^{1, 3, 4}	F = 240							
						0260 ^{1, 4}	H = 380							
						0400 ^{1, 4}	J = 400							
						0600 ^{1, 4}	K = 415							
						0800 ⁴	L = 440							
						1000 ⁴	M = 460							
						1200 ^{4, 5}	N = 480							
						1600 ^{4, 5}	P = 550							
			2000 ^{4, 5}	Q = 575										
			2600 ^{4, 5}	R = 600										
			3000 ^{4, 5}											

- Notes:**
- Switch sizes 30-600 amperes supplied in non-secure enclosures as standard.
 - 115-120 volt available for 30-400 amperes only. For other voltages contact ASCO.
 - 200 and 230 amperes rated switches for use with copper cable only.
 - Switch sizes 800-3000 amperes, and 150-400 amperes 3ADTS/3NDTS provided in secure type outdoor enclosures when required.
 - Use Type 3R secure for 1200, 2000, 2600, and 3000.
 - Type 304 stainless steel is standard. Suitable for indoor or outdoor use where there may be caustic or alkali chemicals in use. To provide an improved reduction in corrosion of salt and some chemicals, optional type 316 stainless steel is recommended. This is the preferred choice for marine environments.
 - Available on switches rated 1200, 2000, 2600, and 3000 amperes.
 - When temperatures below 32°F can be experienced, special precautions should be taken, such as the inclusion of strip heaters, to prevent condensation and freezing of this condensation. This is particularly important when environmental (Type 3R, 4) are ordered for installation outdoors.
 - Type 3R enclosures are not suitable for installations subject to wind blown rain or snow. Use type 4 enclosures where available or install supplemental shelter protection around the 3R enclosure.

SERIES 300 EXTERNAL POWER CONNECTIONS

Size UL-Listed Solderless Screw-Type Terminals

SWITCH RATING (AMPERES)	RANGES OF AL-CU WIRE SIZES (UNLESS SPECIFIED COPPER ONLY)
30-230 ² ATS and NTS only	One #14 to 4/0 AWG
150*, 260, 400	Two 1/0 AWG to 250 MCM or One #4 AWG to 600 MCM
600	Two 2/0 AWG to 600 MCM
800, 1000, 1200	Four 1/0 to 600 MCM
1600, 2000	Six 1/0 to 600 MCM
2600, 3000	Twelve 1/0 to 750 MCM

Notes:

- All SERIES 300 switches are furnished with a solid neutral plate (unless switched neutral configuration is specified) and terminal lugs.
 - 200 and 230 amperes rated switches for use with copper cable only. Refer to paragraph 310.15 of the NEC for additional information.
 - Use wire rated 75°C minimum for all power connections.
- * 150 for DTS only

EXTENDED WARRANTIES FOR SERIES 300 TRANSFER SWITCHES (3ATS/3NTS/3ADTS/3NDTS)

DESCRIPTION
1 Year Extension (Total of 3 Years)
2 Year Extension (Total of 4 Years)
3 Year Extension (Total of 5 Years)

Notes:

- Standard warranty is (24) months, 2 years from date of shipment, extended warranty is in addition to the two years, for a total of, 3, 4, or 5 years.
- Refer to Publication 3223 for warranty terms and conditions.

SERIES 300 Transfer Switch Dimensions and Shipping Weights

UL TYPE 1 ENCLOSURE^{1,2,3,4}

SWITCH RATING AMPS	PHASE POLES	NEUTRAL CODE	DIMENSIONS, IN. (MM)			APPROX. SHIPPING WEIGHT LB. (KG)
			WIDTH	HEIGHT	DEPTH	
30 ³ , 70 ³ , 104 ³ 150 ³ , 200 ³	2	A	18 (457)	31 (787)	13 (330)	69 (32)
	2	B	18 (457)	31 (787)	13 (330)	72 (33)
	3	A	18 (457)	31 (787)	13 (330)	72 (33)
	3	B	18 (457)	31 (787)	13 (330)	75 (34)
230	2	A	18 (457)	48 (1219)	13 (330)	117 (53)
	2	B	18 (457)	48 (1219)	13 (330)	125 (57)
	3	A	18 (457)	48 (1219)	13 (330)	125 (57)
	3	B	18 (457)	48 (1219)	13 (330)	133 (61)
260, 400	2	A	24 (610)	56 (1422)	14 (356)	250 (113)
	2	B	24 (610)	56 (1422)	14 (356)	260 (118)
	3	A	24 (610)	56 (1422)	14 (356)	260 (118)
	3	B	24 (610)	56 (1422)	14 (356)	270 (123)
150, 200, 230 SERIES 3ADTS/3NTS only	2	A	24 (610)	56 (1422)	14 (356)	250 (113)
	2	B	24 (610)	56 (1422)	14 (356)	260 (118)
	3	A	24 (610)	56 (1422)	14 (356)	260 (118)
	3	B	24 (610)	56 (1422)	14 (356)	270 (123)
600	2	A	24 (610)	63 (1600)	17 (432)	300 (137)
	2	B	24 (610)	63 (1600)	17 (432)	320 (146)
	3	A	24 (610)	63 (1600)	17 (432)	320 (146)
	3	B	24 (610)	63 (1600)	17 (432)	320 (151)
800, 1000	2	A	34 (864)	72 (1829)	20 (508)	431 (196)
	2	B	34 (864)	72 (1829)	20 (508)	460 (209)
	3	A	34 (864)	72 (1829)	20 (508)	460 (209)
	3	B	34 (864)	72 (1829)	20 (508)	489 (222)
1200	2	A	38 (965)	87 (2210)	23 (584)	581 (264)
	2	B	38 (965)	87 (2210)	23 (584)	611 (277)
	3	A	38 (965)	87 (2210)	23 (584)	611 (277)
	3	B	38 (965)	87 (2210)	23 (584)	639 (290)
1600, 2000	3	A	38 (965)	87 (2210)	23 (584)	1160 (525)
	3	B	38 (965)	87 (2210)	23 (584)	1160 (525)
2600, 3000	3	A	38 (965)	91 (2311)	72 (1829)	1430 (649)
	3	B	38 (965)	91 (2311)	72 (1829)	1495 (679)

Notes:

- Unit is designed for top cable entry of emergency and load, and bottom entry of normal. A cable pull box is also available for all top or bottom cable access when required (optional accessory kit #K609027). Not required for type 3R, 4X and 12 enclosures where available.
- Enclosures for 2600, 3000 amperes are free-standing with removable top, sides and back.
- Dimensions for 30-200 amperes when furnished with accessory 135L power meter, 18"W - 41"H - 13"D
- Dimensional data is approximate and subject to change. Certified dimensions available upon request.

UL TYPE 3R, 4 OR 12 ENCLOSURE^{1,2,3,4}

SWITCH RATING AMPS	PHASE POLES	NEUTRAL CODE	DIMENSIONS, IN. (MM)			APPROX. SHIPPING WEIGHT LB. (KG)
			WIDTH	HEIGHT	DEPTH	
30 ² , 70 ² , 104 ² 150 ² , 200 ² (Non-Secure Enclosure)	2	A	17.5 (445)	35 (886)	11.625 (295)	84 (38)
	2	B	17.5 (445)	35 (886)	11.625 (295)	87 (40)
	3	A	17.5 (445)	35 (886)	11.625 (295)	87 (40)
	3	B	17.5 (445)	35 (886)	11.625 (295)	90 (41)
230 (Non-Secure Enclosure)	2	A	18 (458)	50.5 (1284)	14.33 (364)	90 (41)
	2	B ³ or C	18 (458)	50.5 (1284)	14.33 (364)	132 (60)
	3	A	18 (458)	50.5 (1284)	14.33 (364)	140 (63)
	3	B ³ or C	18 (458)	50.5 (1284)	14.33 (364)	148 (67)
260, 400	2	A	24 (610)	63 (1600)	18.2 (462)	320 (146)
	2	B	24 (610)	63 (1600)	18.2 (462)	340 (155)
	3	A	24 (610)	63 (1600)	18.2 (462)	340 (155)
	3	B	24 (610)	63 (1600)	18.2 (462)	350 (160)
150, 200, 230 SERIES 3ADTS/3NTS only (Non-Secure Enclosure)	2	A	24 (610)	63 (1600)	18.2 (462)	320 (146)
	2	B	24 (610)	63 (1600)	18.2 (462)	340 (155)
	3	A	24 (610)	63 (1600)	18.2 (462)	340 (155)
	3	B	24 (610)	63 (1600)	18.2 (462)	350 (160)
600 (Non-Secure Enclosure)	2	A	24 (610)	63 (1600)	18.2 (462)	320 (146)
	2	B	24 (610)	63 (1600)	18.2 (462)	340 (155)
	3	A	24 (610)	63 (1600)	18.2 (462)	340 (155)
	3	B	24 (610)	63 (1600)	18.2 (462)	350 (160)
800, 1000	2	A	34 (859)	72 (1821)	20 (508)	519 (236)
	2	B	34 (859)	72 (1821)	20 (506)	543 (246)
	3	A	34 (859)	72 (1821)	20 (506)	543 (246)
	3	B	34 (859)	72 (1821)	20 (506)	565 (257)
1200 (Secure Enclosure)	2	A	41 (1037)	95.5 (2415)	33.5 (848)	1131 (513)
	2	B	41 (1037)	95.5 (2415)	33.5 (848)	1160 (526)
	3	A	41 (1037)	95.5 (2415)	33.5 (848)	1160 (526)
	3	B	41 (1037)	95.5 (2415)	33.5 (848)	1189 (539)
1600, 2000 (Secure Enclosure)	3	A	42.5 (1074)	95.5 (2529)	47 (1189)	1705 (775)
	3	B	42.5 (1074)	95.5 (2529)	47 (1189)	1830 (832)
2600, 3000 (Secure Enclosure)	3	A	41 (1037)	95.5 (2529)	74 (1872)	2150 (976)
	3	B	41 (1037)	95.5 (2529)	74 (1872)	2230 (1012)

Notes:

- When climate conditions at installation site present condensation risk, special precautions should be taken, such as the inclusion of space heaters, to prevent interior condensation and freezing of this condensation.
- Dimensions for 30-200 amperes when furnished with a power meter 18"W - 48"H - 13"D
- 30-1000 amperes switches are available in secure type enclosures, contact ASCO for details.
- Dimensional data is approximate and subject to change. Certified dimensions available upon request.

SERIES 300 72EE MONITORING SCREENS

ALARM STATUS
No Active Alarm

STATISTICS	VALUE
Total Transfers	35
Transfers Due to Source Failure	3
Total Number of Days Panel Energized	120
Time Normal Available (d,h,m)	115d 17h 51m
Time Emergency Available (d,h,m)	119d 18h 46m
Total Time On Normal (d,h,m)	112d 1h 42m
Total Time On Emergency (d,h,m)	10d 3h 45m
Generator Start Elapsed Time (Sec.)	1
In-Phase Time (Sec.)	6553.5

POWER	SYSTEM	A	B	C	MAX WATTS DEMAND	VALUE
KW	0	0	0	0	Max. Demand (kW)	0
KVA	0	0	0	0	Max. Demand Date	00/00/2000
KVAR	0	0	0	0	Max. Demand Time	00:00
Power Factor	0.00	0.00	0.00	0.00	In Last Hour (kW)	0
Frequency (Hz)	60.0	--	--	--	In Last Day (kW)	0

Dashboard

ENERGY CONSUMPTION	VALUE
Normal (kWh)	0
Emergency (kWh)	0

POWER SYSTEM GENERAL SETTINGS	VALUE
System Type	1Phase-2Wire
Source type	LOAD
Nominal Voltage (Volts)	480
Nominal Current (Amps)	400
PT Ratio	120/120
CT Ratio	400/5
Neutral CT Ratio	400/5

MAX WATTS DEMAND	VALUE
Max. Demand (kW)	0
Max. Demand Date	00/00/2000
Max. Demand Time	00:00
In Last Hour (kW)	0
In Last Day (kW)	0
In Last Month (kW)	0
In Last Year (kW)	0
Demand Interval (min)	10

VOLTAGE L-N	VALUE
Van (Volts)	119

Power Metering

LOG NO.	EVENT DATE & TIME	EVENT TYPE	EVENT CAUSE
1	12/11/2017 11:41:08.5	Engine Stop	---
2	12/11/2017 11:41:03.5	Emergency Source Accepted	---
3	12/11/2017 11:41:03.5	Normal Source Accepted	---
4	12/11/2017 11:41:02.2	Engine Start	Normal Not Accepted
5	12/11/2017 11:40:59.2	Emergency Source Not Accepted	Emergency Under Voltage
6	12/11/2017 11:40:59.1	Normal Source Not Accepted	Normal Under Voltage
7	11/29/2017 17:24:59.2	Engine Stop	---
8	11/29/2017 17:24:53.1	Transfer Emergency to Normal	---
9	11/29/2017 17:14:52.9	Normal Source Accepted	---
10	11/22/2017 10:44:40.4	Transfer Normal to Emergency	Normal Not Accepted
11	11/22/2017 10:44:40.1	Initial Switch Position (boot up)	Switch on Normal
12	11/22/2017 10:44:39.1	Emergency Source Accepted	---
13	11/22/2017 10:44:39.0	Emergency Source Not Accepted	Emergency Under Voltage
14	11/22/2017 10:44:39.0	Normal Source Not Accepted	Normal Under Voltage
15	11/22/2017 10:43:50.5	Engine Start	Normal Not Accepted
16	11/22/2017 10:43:47.4	Normal Source Not Accepted	Normal Under Frequency
17	11/16/2017 12:11:58.5	Emergency Source Not Accepted	Emergency Under Frequency
18	11/16/2017 12:11:52.3	Engine Stop	---
19	11/16/2017 12:11:46.5	Transfer Emergency to Normal	---
20	11/16/2017 12:11:46.3	Timer 3A Bypass	Local User
21	11/16/2017 12:11:44.2	Transfer Normal to Emergency	---
22	11/16/2017 12:11:43.7	Emergency Source Accepted	---

Events

5170 QUAD-ETHERNET MODULE CONFIGURATION

Device Detection: TTLRS485 APAC
APAC device found, please save

TCP/IP Alias Address

Enable	Type	Modbus	ASCobus	Name	Actual address
1	<input checked="" type="checkbox"/>	Group G	1	ATS 1	15
2	<input checked="" type="checkbox"/>	DPM	2	ASCO1	20
3	<input type="checkbox"/>		3		0
4	<input type="checkbox"/>		4		0
5	<input type="checkbox"/>		5		0

ETHERNET TCP/IPv4

AES Mode: Enable Disable
DHCP Mode: Enable Disable
IP Address: 47.19.223.24
Subnet Address: 255.255.0.0
Gateway Address: 47.19.223.1
TCP Port: 10002

SMTP CONFIGURATION FOR EMAIL NOTIFICATION

Email Notification: Enable Disable
Authentication: Enable Disable
Username: smtp@ascopower.com
Password: Password
SMTP Port Number: 587
DNS Server IP Address: 8.8.8.8
Host Name/IP Address: Server.ASCO.com
From Email Address: QEMCare@ascopower.com
To Email Address 1: default4@to.com
To Email Address 2: jrmatos5@gmail.com
To Email Address 3: default3@to.com
To Email Address 4: default4@to.com
To Email Address 5: default5@to.com

ALERT NOTIFICATIONS FOR EMAIL AND SNMP

Generator Start Signal Activated
 Generator Start Signal Removed

Configuration

5170 QUAD-ETHERNET MODULE & CONNECTED DEVICES

TRANSFER SWITCH CONTROLLER

Controller Type: Group G
Firmware Version: 894063-033
Firmware Date: 06/08/17
Nominal Voltage (Volts): 120
Nominal Current (Amps): 150
Nominal Frequency (Hz): 60
Name: ATS 1
Location: BASEMENT
Device Address: 16
Transfer Switch Type: OTTS

POWER METER - LOAD

Firmware Version: 843086-019
Firmware Date: Apr 18 2017
Name: ASCO1
Location: ASCO
Device Address: 20

5170 QUAD-ETHERNET MODULE

Firmware Version: 987204-020
Firmware Date: 11/13/2017
Bootloader Version: 987213-002
MAC Address: 00:01:01:02:03:84
IP Address: 47.19.223.24

CONTACT INFORMATION

ASCO Power Technologies - Global HQ
160 Park Avenue,
Florham Park, New Jersey 07932
United States
International Number: +1 973 360-3600
Main Number: +1 800 800-2726
Email: customercare@ascopower.com
Website: www.ascopower.com

About

Content-rich monitoring screens enable real-time information for power metering, event logs, voltages, time delays and alerts. The 72EE also allows for remote switch transfer.

SERIES 300 72EE CONNECTIVITY MODULE

The ASCO 72EE Connectivity Module offers remote monitoring for SERIES 300 ATs and 5210 Power Meter. For the ATS, the optional accessory 72EE provides remote ATS and generator control, monitoring and connectivity features via integrated web page dashboards. Once connected to an Ethernet, WiFi or cellular connection, the dashboards can easily be pulled up by any mobile or desktop device on the network by multiple users.

CONTROL

The control capabilities allows remote transfer and retransfer of the ATS while allowing you to view time delays and bypass functions. The generators can also be called to start and stop for emergency situations as well as for testing and maintenance. Running the generator periodically ensures that the battery is charged for power anomalies and increases reliability. Generator pick-up and drop-out set points are also viewable for comprehensive understanding of control events.

MONITORING

Monitor transfer switch and generator health, system state, metering and review calculated transfer statistics and activity. Active control timer information allows the operator to anticipate an automated control action such as generator start or ATS transfer. The device can also interface with an email server to keep users up-to-date on alarms and critical power events with alerts. In addition the 72EE can interface to an optional 5210 Power Meter, (stand-alone or with the ATS Acc. 135L) for enhanced monitoring features such as power metering, demand and energy usage.

CONNECTIVITY

Connect and extract ATS and metering data using industry-standard open protocols such as Modbus and SNMP. An integrated four-port Ethernet switch maximizes connectivity options and flexibility. Embedded password protection will only allow access to appropriate users while utilizing AES 128-bit encryption for enhanced data security per National Institute of Standards and Technology (NIST).



Fig. 22: Accessory 72EE

ADDITIONAL OPTIONAL POWERQUEST COMPONENTS

5160
Connectivity
Module



ASCO 5160 Remote Connectivity Unit (RCU) provides 10 Ethernet and Dual-Fiber Optic connections in a NEMA 3R enclosure.

5210, 5220
Power
Manager



ASCO 5210 (Left) and 5220 (Right) Power Meters measure, displays and provides single- or 3-phase Energy and Power information

ASCO 5221
Power Manager
Unit



ASCO 5221 Power Manager Unit (PMU) enables power measurement, discrete inputs for status and output relays for control of generators, breakers and other power equipment via 5700 Series CPMS solutions.

5310, 5350
Annunciators



ASCO 5310 (Left) and 5350 (Right) ATS Remote Annunciators provide distributed monitoring of transfer switch position and source availability as well as transfer test and re-transfer control.

5710,
5750, 5790
Display
Terminals



5700 Critical Power Management Systems (5790 Shown) provide various levels of monitoring, control and management capability of power equipment. It seamlessly monitors ASCO transfer switches as well as generators, breakers, paralleling busses, panel boards and other power equipment via a 5221 PMU. It consists of servers and touch-screen interfaces.



FULFILL YOUR NEED

Drill down for a closer look - Each transfer switch, generator, breaker and any other power equipment has its own dedicated screens.



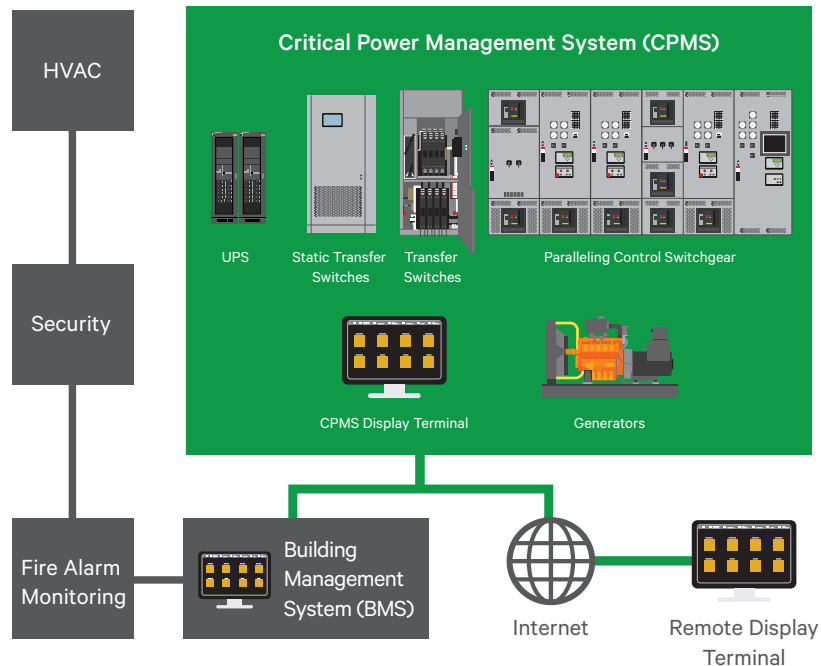
ASCO POWERQUEST® POWER MONITORING AND CONTROL SYSTEMS

The PowerQuest® family is the most comprehensive communication, monitoring and control solution ever offered by ASCO Power Technologies. It empowers you. It provides the ability to test, manage loads, optimize the bus bar, remotely monitor and be aware of the status of your facility's utility source and on-site power. It provides reports for events, tests, energy use or settings, and gets data directly from generators and transfer switches.

Whether users require standard monitoring and control or a comprehensive Critical Power Management System, PowerQuest can satisfy your needs.

Hardware. Software. Installation and testing. Service. And upgrades and technology refreshes. A truly complete solution for all your communication, monitoring and control needs.

This web-enabled management system is based on open protocols. As communications among equipment improve, so does the performance of critical power systems.



PowerQuest provides monitoring, alarming and control of Critical Power Management Systems, which comprise transfer switches, paralleling control switchgear, gensets, circuit breakers, UPSs, load banks, distribution and other gear. It also integrates with building management systems.

BE EMPOWERED POWERQUEST CAN ENABLE YOU TO:

- Monitor and control power transfer switches, paralleling control switchgear, gensets, breakers, UPS, bus bars and other equipment.
- Monitor normal and emergency voltages and frequency and their settings.
- Know transfer switch position and source availability.
- Transfer and re-transfer loads for system testing.
- View and adjust transfer switch time-delay settings.
- Receive automatic alerts or selected system alarms on system operation via email or pager.
- View transfer switch event log and know the transfer switch test schedule.
- Generate reports for alarms, energy consumption, settings, historical logs and code-mandated tests.

*For more PowerQuest product information see publication 3245

Life Is On | **Schneider**
Electric™

ASCO Power Technologies - Global Headquarters
160 Park Avenue
Florham Park, NJ 07932
Tel: 800 800 ASCO

www.ascopower.com
customercare@ascopower.com



Installation/Start-Up Service Info/ Checklist
Outdoor Housed Unit

Date: _____

Respond to: Service Department: (email) jlucas@curtisps.com

Installing Contractor: _____

Contact (On Site) _____ Cell/ Phone _____

Job Name/ Location: _____

Address _____

City _____ State _____ Zip _____

Directions to Jobsite to follow if necessary.

**THIS FORM IS REQUIRED AND TWO WEEKS NOTICE NEEDED TO PROCESS START-UP REQUEST AND SCHEDULE START-UP SERVICE. PLEASE EMAIL THIS FORM TO jlucas@curtisps.com . **

Please refer to the installation guide in the Owner's Manual of the Generator Set shipped with the unit. The Guide is also available on our Website id PDF format

Contractor Responsibility including but not limited to: (Check each item and initial)

Mechanical

- Clearance around generator set for airflow requirements and servicing (3 feet on all sides, with 6 feet on the radiator outlet end if not sound attenuated)
Unit in place on concrete pad with vibration pads/ isolators with anchor studs/ bolts to prevent movement
Exhaust system completed (muffler with raincap and exhaust flexible connection mounted if shipped loose)

Diesel Fuel System

- Fuel Inlet and Return Lines piped between the unit and external fuel storage tank (Not required if unit is mounted on a sub-base MAIN fuel tank - piping will be required on a sub-base day-tank)
Fuel tank full or sufficient amount of fuel to run unit (minimum 1/2 tank capacity)

Gaseous Fuel System

- (Check as applicable) Properly sized natural gas, or propane fuel line connected to generator set to deliver full-load CFH as specified on unit nameplate
Correct gas pressure at generator set as specified on unit nameplate
Flexible fuel connection (if shipped loose) installed after the fuel solenoid (if shipped loose)

Do Not Connect Batteries!

Electrical

- Generator Set and ATS properly grounded per NEC Article 250 _____
- Properly sized generator set output wiring between the main line breaker and the ATS (s)(vAC) _____
- Normal power available at ATS _____
- Properly sized and correct number of stranded remote start and control wiring between generator set control and ATS (vDC)_____ [Qty three (3) for auto start signal + _____]
- Correct wiring correct number of wires between generator set, ATS and *optional remote annunciator* (if applicable) (vDC). Please request information from sales/ service dept if needed _____
- Properly sized and correct number of stranded remote start and control wiring between generator set control and Fire Pump Controller (vDC)_____ (if applicable) _____

NOTE: For proper unit operation with all MTU microprocessor and solid-state control panels – generator set control and remote annunciator wiring must be in a separate conduit with no vAC present! AC present can cause induced voltages and erratic operation. Please insure this is completed!

- Properly sized/ protected wiring and correct voltage for engine preheater (wired to terminal strip in generator set output box) DO NOT ENERGIZE _____
- Properly sized/ protected wiring and correct voltage for unit mounted battery charger (wired to terminal strip in generator set output box) DO NOT ENERGIZE _____
- Properly sized/ protected wiring and correct voltage to day-tank/ (subbase) (where applicable) DO NOT ENERGIZE _____
- Properly sized and correct number of stranded control wires between radiator duct mounted load bank and ATS (if applicable) _____

NOTE: Preferred installation would have these vAC circuits in a conduit separate from the generator set vAC output conduit or vDC conduit.

- Complete system test requires ATS transfer and sufficient building load _____

** If you have any questions on the above requirements, please contact our office for installation technical support at:

(215) 536-4973 (Mon-Fri 8:00AM to 4:30 PM) **

NOTE: Only one (1) no charge visit is authorized for start-up service. Requirements for a non-warranty return visit for incomplete items are subject to invoice. This form must be completed and returned via fax to schedule start-up service.

Company _____

Signature _____ Printed Name _____

Date _____

YOUR PARTNER FOR



TRANSMITTAL



Transmittal number	E1	Date	11/30/2023
Project	Lockport RAW Water Genera	One Locks Plaza Lockport, NY 14094	
Project number	23-4088-00		
To	Chris Freese, Nussbaumer & Clarke Inc. Work phone 1 (402) 415-4274 Fax 1 (716) 826-7958 cfreese@nussclarke.com		
		3556 Lake Shore Road Suite 500 Buffalo, NY 14219-1494	
Cc			
From	Frey Electric Construction	100 Pearce Ave Tonawanda, NY 14150	

We are sending	Submittal for Enclosed Transfer Switch		
For the purpose of	For approval		
Sent via	E-Mail	Reference	Attached

Copies	Date	Description
1	11/30/2023	Electronic Submittal

Remarks	
By	

SUBMITTAL



Submittal number	E1	Date	11/30/2023
Project	Lockport RAW Water Genera	One Locks Plaza Lockport, NY 14094	
Project number	23-4088-00		
Spec section	262826 (Enclosed Transfer Switch)		
Subsection		Status	Open
Current action	Submitted	Ball in court	
Topic	Submittal for Enclosed Transfer Switch		

Submitter	Jack Lasher
Reviewer	Chris Freese
Cc	

Date submitted	11/30/2023	Submission due date	
Released for review		Review due date	
Date returned		Required on site date	
Date released			

Notes

PROVIDE FACTORY CERTIFIED START-UP TECHNICIAN AND MEET ALL REQUIREMENTS OF SPECICATION SECTION 3.2

PROVIDE OPERATION AND MAINTENANCE MANUAL AND TRAINING PER SPECIFICATION SECTION 3.4



**LOCKPORT PUMP STATION
TRANSFER SWITCH
SUBMITTAL REVISION 00**

November 17, 2023

www.ascopower.com | customercare@ascopower.com
800.800.ASCO | 160 Park Avenue, Florham Park NJ 07932

Internal

Lockport Pump Station

Reference Quote: B1-23-587980-1-1
Sales Order: N/A

TRANSFER SWITCH DETAILS									
ATS NAME	QTY	AMPS / POLES (VOLTS)	BYPASS	TRANSITION TYPE	CATALOG NUMBER	ACCESSORIES	OUTLINE DRAWING	WIRING DIAGRAM	BOM NUMBER
	1	1600 / 3 (480V)	N/A	OPEN	G03ATSA31600NGXC	11BE,18RX	1001395	1001662	1092772

Transfer Switch Withstand and Closing Ratings																					
300, 4000 & 7000 Series																					
ATS NAME	FRAME SIZE	SWITCH RATING AMPS		CURRENT LIMITING FUSES				SPECIFIC BREAKER			TIME BASED			Short Time Ratings ³ (sec)							
		Transfer Switches	Bypass Switches	480V Max.	600V Max.	MAX SIZE, A	CLASS	240V Max.	480V Max.	600V Max.	Time(Sec)	240V Max.	480V Max.	600V Max.	480V Max.			600V Max.			
															.13	.2	.3	.5	.1	.13	.3
-	G ⁸	1600 - 2000	1600 - 2000	200kA	200kA	3000	L	200kA	200kA	100kA	0.05	100kA	100kA	100kA	42kA	36kA	42kA	-			

NOTES:

- 1) All WCR values indicated are tested in accordance with the requirements of UL 1008, 7th Edition.
- 2) Application requirements may permit higher WCR for certain switch sizes.
- 3) Short Time ratings are provided for applications involving circuit breakers that utilize trip delay settings for system selective coordination
- 6) Rating shown is for Bypass switches only, Transfer Switch rating is 100kA
- 8) These frames are only available on the 7000 Series product

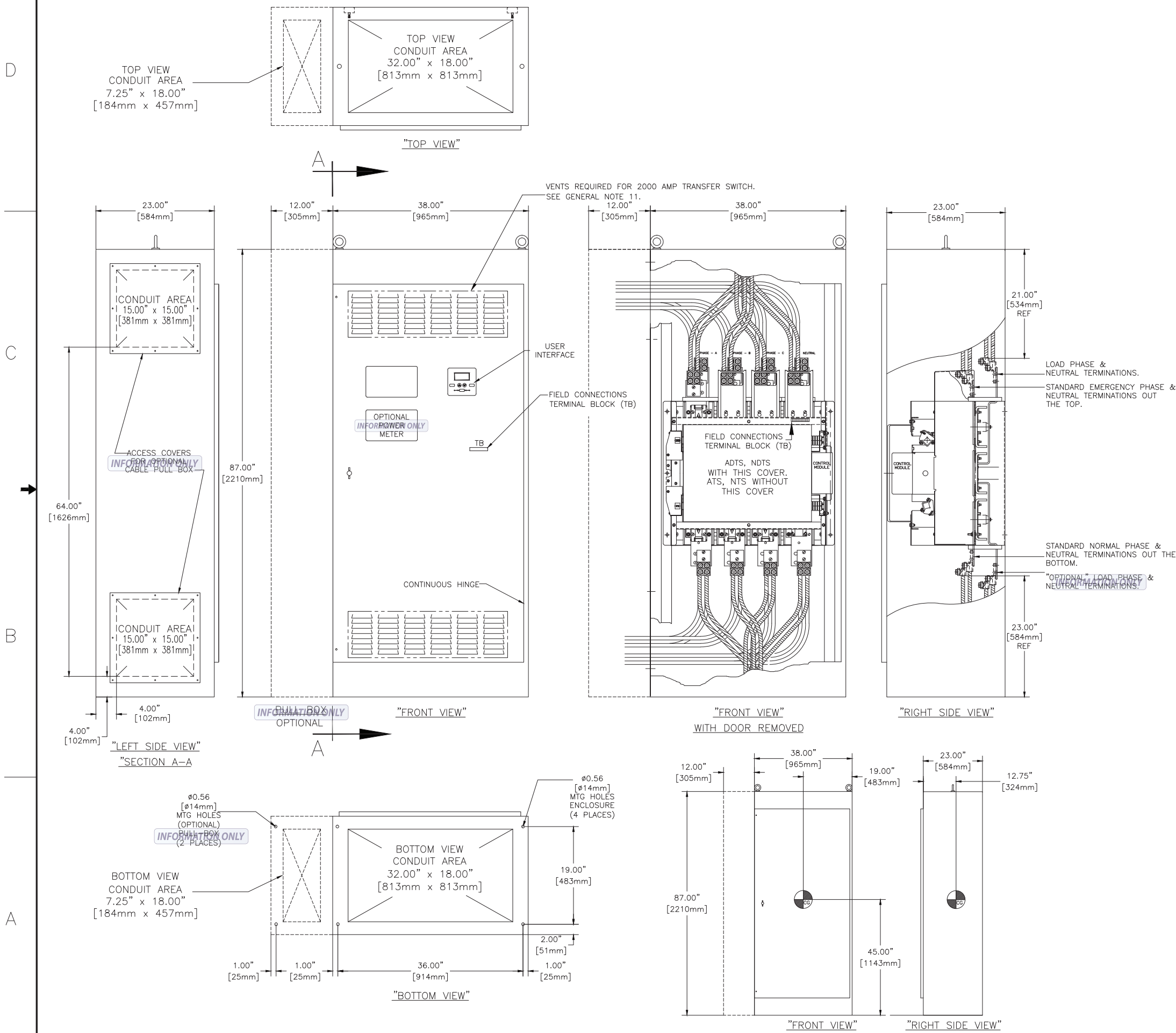
Lockport Pump Station

Transfer Switch Details

#1	ATS	AMPS: 1600	QTY: 1
Product	: Series 300	Catalog Number	: G03ATSA31600NGXC
Service Voltage / Hz	: 480V/60Hz	Optional Accessories	: 11BE,18RX
Bypass Isolation	: Not Applicable	Product Description	: 300 Series, Automatic Open Transition Transfer Switch
No. of Switched Poles: 3	: 3	Neutral Configuration	: Solid [A]
Withstand Rating:	: See WCR Table Below	No. of Cables & Lug Size	: See Outline Drawing
Frame = G, Switch Rating = 1600, Series = 300			
Enclosure	: 1(C)-UL Type 1 Enclosure	Service	: Three Phase, 4-wire
Extended Warranty	: Not Included	Markings	: Not Included

#	ACCESSORY DESCRIPTIONS	
	Accessory Code	Description
1	11BE	Adds the following features to the Group G controller: (1) Serial RS-485 Modbus Communications (2) Multi-Schedule Engine Exerciser (3) a 300 Entry Event Log and (4) a common alarm output function. When applied on 3-phase systems it also enables: (1) 3-Phase Emergency Source VLL sensing (2) Phase Rotation Monitoring (3) Emergency Source VLL Unbalance Monitoring.
2	18RX	REX (Relay Expansion Module) with Normal and Emergency available output contacts (18B & 18G)

OUTLINE FOR ASCO® 300 SERIES 1000-2000 AMPERE "G" FRAME (G3ATS,G3NTS,G3ADTS,G3NDTS) FRONT CONNECTED TRANSFER SWITCHES TYPE 1 ENCLOSURE



GENERAL NOTES

- TYPE 1** ENCLOSURE. FREE STANDING. FLOOR MOUNTED. CODE GAUGE FORMED FRAME CONSTRUCTION.
 - NEC STANDARD GAUGE PAN TYPE DOOR WITH LOCKABLE HANDLE.
 - FINISH: ANSI 61 GRAY, POLYESTER POWDER STANDARD. OTHER ANSI COLORS AVAILABLE CONSULT FACTORY. UL RECOGNIZED.
 - CONSTRUCTION IS IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF UL 1008.
 - RECOMMENDED CLEARANCES:
FRONT: 36.00" [914mm].
 - A 20% RATED GROUND BUS IS PROVIDED.
 - UNIT IS DESIGNED FOR COMBINATION TOP AND BOTTOM CABLE ENTRY. THE STANDARD SWITCH CONFIGURATION IS FOR TOP ENTRY EMERGENCY & LOAD AND BOTTOM ENTRY NORMAL. OPTIONALLY, THE SWITCH MAY BE SUPPLIED WITH BOTTOM ENTRY LOAD. (REFER TO THE WIRING DIAGRAM FURNISHED WITH EACH TRANSFER SWITCH TO DETERMINE TERMINATION POSITIONS).
- IMPORTANT NOTE:**
UNDER NO CIRCUMSTANCES SHOULD POWER CABLES BE ROUTED ALONG THE SIDES OF THE TRANSFER SWITCH. AN OPTIONAL CABLE PULL BOX WHICH MOUNTS ON THE LEFT SIDE OF THE ENCLOSURE IS AVAILABLE WHEN CONDITIONS EXIST FOR WHICH CABLES MUST RUN BETWEEN THE TOP AND BOTTOM OF THE UNIT. GROUND CONDUCTORS ONLY MAY BE RUN ALONG THE LEFT SIDEWALL OF THE ENCLOSURE.
- NEUTRAL CONFIGURATIONS:
AN OPTIONAL FULL RATED NEUTRAL CONFIGURATION FOR EACH SOURCE AND THE LOAD MAY BE PROVIDED. WHEN EQUIPPED IT IS IN ONE OF THE FOLLOWING FORMATS AS SPECIFIED BY THE CATALOG NUMBER NO. NEUTRAL TYPE:
(A) SOLID (COPPER BUS) NEUTRAL.
(B) SWITCHED NEUTRAL POLE.
 - NO KNOCKOUTS ARE PROVIDED.
 - 2000 AMP TRANSFER SWITCH ONLY.
 - (OPTIONAL) LEFT SIDE PULL BOX AVAILABLE FOR TOP AND BOTTOM CABLE ACCESS WHEN REQUIRED. CONTACT FACTORY FOR DETAILS AND SHIPPED SEPARATELY.
A. TO ATTACH PULL BOX TO THE LEFT SIDE OF THE ENCLOSURE. REMOVE CONDUIT SIDE COVERS FROM ENCLOSURE. MOVE PULL-BOX INTO POSITION. USE HARDWARE FROM CONDUIT SIDE COVERS TO ATTACH THE PULL-BOX TO ENCLOSURE.

CABLING NOTES

- ALL SIZES SUPPLIED STANDARD WITH MECHANICAL (SCREW TYPE) LUGS. (SEE AMP SIZE BELOW)
A. LUG MATERIAL: ALUMINUM ALLOY 6061-T6 WITH ELECTRO TIN PLATED FINISH.
B. SCREW MATERIAL: ALUMINUM ALLOY 6262-T9 WITH ELECTRO TIN PLATED FINISH.
C. UL LISTED, CSA CERTIFIED.
D. LUG SCREW TIGHTENING TORQUE PER UL 486B: 19 FT-LBS.
E. SUITABLE WIRE BENDING SPACE IS PROVIDED. (SEE AMP SIZE BELOW)
- GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS. (SEE AMP SIZE BELOW)

NOTES 1000-1200 AMPS

- SUPPLIED WITH STANDARD MECHANICAL (SCREW TYPE) LUGS ON THE NORMAL, EMERGENCY & LOAD BUS STABS. ONE (1) LUG PER PHASE AND NEUTRAL EACH SUITABLE FOR CONNECTION OF FOUR (4) 1/0 - 750MCM CU/AL CABLE (SEE NOTE "E" BELOW).
E. SUITABLE WIRE BENDING SPACE IS PROVIDED FOR UP TO FOUR (4) 600MCM CABLES PER TERMINAL PER NEC.
- GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS;
(12) 1/0 - 750MCM CU/AL CABLE

NOTES 1600-2000 AMPS

- SUPPLIED WITH STANDARD MECHANICAL (SCREW TYPE) LUGS ON THE NORMAL, EMERGENCY & LOAD BUS STABS. ONE (1) LUG PER PHASE AND NEUTRAL EACH SUITABLE FOR CONNECTION OF SIX (6) 1/0 - 750MCM CU/AL CABLE (SEE NOTE "E" BELOW).
E. SUITABLE WIRE BENDING SPACE IS PROVIDED FOR UP TO SIX (6) 750MCM CABLES PER TERMINAL PER NEC.
- GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS;
(12) 1/0 - 750MCM CU/AL CABLE

Job Name: Lockport Pump Station
 ATS Name:
 Catalog No.: G03ATSA31600NGXC.11BE.18RX

PROJECT NAME:		REV. TO SHEET		ECN NO.	BY	APP.	DATE
OUTLINE		300 SERIES		1000-2000 AMP (F/C ONLY)		THIRD ANGLE PROJECTION	
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005		ASSEM. REF. NO.	COMPUTER GENERATED DRAWING		
DRAWN BY	BWM	10/25/13	PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		DWG. NO.	SCALE	SIZE
CHECKED	SDH	10/25/13	1001395		1001395	DS	
PROJECT APPROVAL	SDH	10/25/13	ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DRAWING B	ECN NO.	SHEET
FINAL APPROVAL			289440		289440	1	1 OF 1

THREE PHASE WIRING FOR ASCO® 300 SERIES TRANSFER SWITCHES (G3ATS/G3NTS) 1000-3200 AMPERES WITH GROUP G CONTROLS

GENERAL INFORMATION

THIS WIRING APPLIES TO 300 SERIES TRANSFER SWITCHES THAT UTILIZE THE "G" FRAME POWER TRANSFER SWITCH RATED 1000-3200 AMPERES.

THE GROUP G CONTROLLER PROVIDES EITHER AUTOMATIC (G3ATS) OR NON-AUTOMATIC [MANUAL] (G3NTS) OPERATION BASED ON ITS FACTORY SETTING ACCORDING TO THE CUSTOMER ORDER REQUIREMENTS.

THE TYPE OF TRANSFER SWITCH PROVIDED CAN BE DETERMINED FROM THE PRODUCT IDENTIFICATION MARKINGS LOCATED ON BOTH THE POWER TRANSFER SWITCH AND THE COVER OF THE GROUP G CONTROLLER.

ALL OPERATIONAL SETTINGS AND SEQUENCES OF THE GROUP G CONTROLLER AND ITS RELATED OPTIONAL ACCESSORIES (1UP, 18RX, 23G) ARE PROVIDED IN THE USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400.

INFORMATION FOR INSTALLATION AND TESTING OF THE TRANSFER SWITCH IS PROVIDED IN THE INSTALLATION MANUAL, ASCO 3ATS & 3NTS, G-DESIGN 1000-3200 A TRANSFER SWITCHES, PART NUMBER 381333-406.

ENGINE CONTROL CONTACTS

FEATURE 7 & FEATURE 8:
ONE SET OF FORM C CONTACTS "NR" (FEAT. 7 N/C, FEAT. 8 N/O) THAT CHANGE POSITION ON EXPIRATION OF THE FEATURE 1C, OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES TIME DELAY, AND RESET ON EXPIRATION OF THE FEATURE 2E ENGINE COOLDOWN TIME DELAY.
AN AUXILIARY CONTACT THAT IS CLOSED WHEN THE TRANSFER SWITCH IS CONNECTED TO THE EMERGENCY SOURCE, IS CONNECTED ACROSS THE N/C CONTACT (FEATURE 7).

AN ADDITIONAL SET OF ENGINE STARTING CONTACTS ARE AVAILABLE ON THE GROUP G CONTROLLER WHEN THE FEATURE SETTING OF THE CONTROLLER OUTPUT CONTACTS "OP1" IS SET TO OPERATE AS "NR2".

ADDITIONAL OPTIONAL ENGINE STARTING CONTACTS "NR2" ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2" AND/OR "OP3" PROVIDE THE ENGINE STARTING FUNCTION WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "NR2".

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR SETTING INFORMATION.

LOAD DISCONNECT FEATURE

FEATURE 31: INCLUDES SUB-FEATURES 31F, 31G, 31M, 31N
A SET OF FORM C CONTACTS ARE PROVIDED ON THE GROUP G CONTROLLER AS "OP1". WHEN THE FEATURE SETTING OF "OP1" IS SET TO OPERATE THE CONTACTS AS "FEATURE 31", THE TIME DELAY SETTINGS OF THE SUB-FEATURES ARE AVAILABLE.

"OP1" CAN BE SET TO OPERATE TO PROVIDE THE FOLLOWING FUNCTIONS USING THE TIME DELAY SETTINGS ASSOCIATED WITH EACH SUB-FEATURE:

- 31F - NORMAL TO EMERGENCY PRE-TRANSFER SIGNAL
 - 31G - EMERGENCY TO NORMAL PRE-TRANSFER SIGNAL
 - 31M - NORMAL TO EMERGENCY POST-TRANSFER SIGNAL
 - 31N - EMERGENCY TO NORMAL POST-TRANSFER SIGNAL
- THE "OP1" OUTPUT CONTACTS CHANGE POSITION FOLLOWING EACH OF THE ABOVE TIME DELAYS.

ADDITIONAL LOAD DISCONNECT CONTACTS, "FEATURE 31" ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2" AND/OR "OP3" WILL PROVIDE LOAD DISCONNECT FUNCTIONS WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "FEATURE 31".

ALL OUTPUT CONTACTS ("OP1", "OP2", "OP3") SET TO OPERATE AS "FEATURE 31", SHARE THE COMMON TIME DELAY SETTINGS OF SUB-FEATURES 31F, 31G, 31M, AND 31N.

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR SETTING INFORMATION.

INPHASE TRANSFER FEATURE FOR LOAD TRANSFER

INPHASE TRANSFER CONTROL INITIATES AN INPHASE TRANSFER OF LOADS BETWEEN LIVE SOURCES. THIS IS USED TO PREVENT NUISANCE TRIPPING OF DISTRIBUTION CIRCUIT BREAKERS AND POSSIBLE DAMAGE TO MECHANICAL LOADS ASSOCIATED WITH OUT OF PHASE TRANSFER.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR SETTING INFORMATION.

SOURCE AVAILABILITY SIGNALS

SIGNALS INDICATING THE AVAILABILITY OF THE NORMAL & EMERGENCY SOURCES IS PROVIDED WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "RL5" (EMERGENCY SOURCE AVAILABLE) AND "RL6" (NORMAL SOURCE AVAILABLE) CHANGE POSITION WHEN THE SOURCE IS ACCEPTABLE.

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

NOTES

1. SWITCH SHOWN DE-ENERGIZED CONNECTED TO NORMAL SOURCE.
2. DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUB. ICS 1, PART 1-101A.
3. ALL WIRING IS #16 AWG, TINNED, STRANDED COPPER UNLESS OTHERWISE INDICATED.
4. ○ INDICATES CUSTOMER CONNECTION POINTS.
4. ● INDICATES FACTORY CONNECTION POINTS.
5. CONNECTION POINTS THAT HAVE BOTH CUSTOMER CONNECTIONS AND FACTORY CONNECTIONS ARE SHOWN OPEN AS CUSTOMER CONNECTION POINTS.
6. THE TRANSFER UNIT IS MOUNTED ON THE BACK INSIDE SURFACE OF THE ENCLOSURE. THE CONTROL PANEL AND ANY OPTIONAL ACCESSORIES ARE MOUNTED ON THE INSIDE SURFACE OF THE DOOR.
7. AN OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.
8. GROUND STRAP ON CONTROL PANEL IS AFFIXED TO CHASSIS (ENCLOSURE) AT LOWER LEFT CONTROL PANEL MOUNTING STUD.

COMMON ALARM & NOT IN AUTO SIGNALING FEATURES

A SET OF FORM C CONTACTS IS PROVIDED ON THE GROUP G CONTROLLER AS "OP1". THE FEATURE SETTING OF "OP1" CAN BE SET TO OPERATE THE CONTACTS AS A "NOT IN AUTO" SIGNAL.

WHEN "OP1" IS SET FOR "NOT IN AUTO", THE OUTPUT CONTACTS CHANGE POSITION WHEN THE TRANSFER IS BEING INHIBITED FROM TRANSFERRING TO THE EMERGENCY SOURCE (FEATURE 34B) OR THE TRANSFER SWITCH HAS BEEN SET FOR NON-AUTOMATIC (MANUAL) OPERATION.

WHEN OPTIONAL ACCESSORY 11BE "SOFTWARE BUNDLE" IS PART OF THE TRANSFER SWITCH ASSEMBLY, "OP1" MAY ALTERNATIVELY SET FOR A "COMMON ALARM" SIGNAL. THE OUTPUT CONTACTS CHANGE POSITION WHEN A "COMMON ALARM" IS NOT PRESENT AND RESET WHEN A "COMMON ALARM" CONDITION IS PRESENT. THE "COMMON ALARM" SIGNAL CONDITIONS ARE SELECTABLE.

ADDITIONAL "COMMON ALARM" AND "NOT IN AUTO" CONTACTS ARE AVAILABLE WHEN OPTIONAL ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2 AND/OR "OP3" WILL PROVIDE SIGNAL FUNCTIONS WHEN THE FEATURE SETTING OF EACH IS SET TO OPERATE AS "COMMON ALARM" OR "NOT IN AUTO".

CONTACTS ARE RATED 5 AMPS RESISTIVE AT 30 VDC MAXIMUM, 100 mA AT 5 VDC MINIMUM.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR SETTING INFORMATION.

EXTERNAL POWER SUPPLY COMPATIBILITY

USE OF AN EXTERNAL POWER SUPPLY IS USEFUL WHEN REQUIRED TO EXTEND THE FOLLOWING CONTROLLER TIME DELAYS BEYOND 6 SECONDS:

FEATURE 1C - OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES
FEATURE 1F - OVERRIDE MOMENTARY EMERGENCY SOURCE OUTAGES

AN EXTERNAL POWER SUPPLY IS ALSO USEFUL WHEN THE TRANSFER SWITCH IS USED WITH COMMUNICATIONS FEATURES BY ENABLING THE CONTROLLER TO CONTINUE COMMUNICATING.

AN EXTERNAL POWER SOURCE MAY BE PROVIDED TO THE CONTROLLER, UNTIL THE NORMAL SOURCE OR EMERGENCY SOURCE IS AVAILABLE, BY USE OF:

- AN EXTERNAL 24 VDC POWER SUPPLY WITH ACCESSORY 18RX (RELAY EXPANSION MODULE) OR
- OPTIONAL ACCESSORY 1UP (UNINTERRUPTIBLE POWER SUPPLY MODULE)

EXTERNAL 24 VDC POWER SUPPLY (OPTIONAL)

AN EXTERNAL 24 VDC POWER SUPPLY MAY BE USED TO POWER THE CONTROLLER WHEN ACCESSORY 18RX (RELAY EXPANSION MODULE) IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY. OUTPUT CONTACTS "OP2" WILL PROVIDE EXTERNAL 24 VDC POWER SUPPLY FUNCTIONALITY WHEN ITS FEATURE SETTING IS SET TO OPERATE AS "1G". ADDITIONALLY, JUMPERS MUST BE RECONFIGURED ON ACCESSORY 18RX (RELAY EXPANSION MODULE) TO ENABLE THIS FUNCTION AS FOLLOWS:

REMOVE JUMPERS "J1" 1-2 & "J1" 3-4
CONNECT JUMPERS "J1" 5-7 & "J1" 6-8

THE OUTPUT CONTACTS CHANGE POSITION WHEN EITHER THE NORMAL SOURCE OR EMERGENCY SOURCE IS AVAILABLE AND RESET WHEN NEITHER SOURCE IS AVAILABLE. THE "OP2" N/C CONTACT SWITCHES CUSTOMER PROVIDED +24 VDC FROM THE EXTERNAL POWER SUPPLY TO THE CONTROLLER.

ACCESSORY 1UP (UNINTERRUPTIBLE POWER SUPPLY)

WHEN OPTIONAL ACCESSORY 1UP IS INCLUDED IN THE TRANSFER SWITCH ASSEMBLY, THE CONTROLLER IS PROVIDED WITH LIMITED RESERVE POWER (APPROXIMATELY 3 MINUTES).

LOAD CURRENT METERING

WHEN OPTIONAL ACCESSORY 23GB IS PART OF THE TRANSFER SWITCH ASSEMBLY, THREE PHASE CURRENT MEASUREMENTS ARE AVAILABLE FOR DISPLAY ON THE GROUP G CONTROLLER.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR SETTING INFORMATION.

ADVANCED-FUNCTION SOFTWARE BUNDLE

WHEN OPTIONAL ACCESSORY 11BE IS PART OF THE TRANSFER SWITCH ASSEMBLY, AN ADVANCED-FUNCTION SOFTWARE BUNDLE IS AVAILABLE TO PERFORM THE FOLLOWING FUNCTIONS:

- SERIAL COMMUNICATIONS (RS-485)
- PROGRAMMABLE ENGINE EXERCISER
- EVENT LOG
- COMMON ALARM SIGNAL CAPABILITY ON GROUP G CONTROLLER "OP1" OUTPUT.

(3 PHASE SENSING ONLY)
- 3 PHASE EMERGENCY SOURCE SENSING.
- PHASE ROTATION SENSING.
- EMERGENCY VOLTAGE UNBALANCE SENSING.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR INFORMATION ON THESE FUNCTIONS.

NON-AUTOMATIC (MANUAL) OPERATION

TRANSFER SWITCH ASSEMBLIES FACTORY SET FOR NON-AUTOMATIC OPERATION PROVIDE USER INITIATED, ELECTRICAL OPERATION OF THE TRANSFER SWITCH TO EITHER AVAILABLE SOURCE. THE TRANSFER SWITCH ASSEMBLY IS PHYSICALLY IDENTICAL TO THAT OF THE AUTOMATIC TYPE.

WHEN THE TRANSFER SWITCH IS SET FOR NON-AUTOMATIC OPERATION, A CUSTOMER PROVIDED SELECTOR SWITCH MAY BE USED TO OPERATE IT FROM A REMOTE LOCATION.

REMOTE CONTROL FEATURES

THE FOLLOWING CONTROL PANEL INPUTS PROVIDE REMOTE CONTROL FUNCTIONS FOR THE TRANSFER SWITCH. EACH FUNCTION CAN BE IMPLEMENTED BY THE CUSTOMER PROVIDING THE FORM OF CONTROL DESCRIBED. EACH CONTROL CONTACT MUST BE SUITABLE FOR A 5 VDC LOW ENERGY CIRCUIT.

EXTERNAL FEATURE 17: REMOTE TRANSFER TO EMERGENCY FEATURE (FOR AUTOMATIC TRANSFER TYPE ONLY) - REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT CAUSES ENGINE START AND TRANSFER TO THE EMERGENCY SOURCE. RE-CLOSURE OF THE CONTACT ACTIVATES THE FEATURE 3A "RETRANSFER TO NORMAL (IF JUST TEST)" TIME DELAY PRIOR TO RETRANSFER. IN THE EVENT THAT THE EMERGENCY SOURCE FAILS WHILE THE TRANSFER SWITCH IS CONNECTED TO EMERGENCY AND THE CUSTOMER SUPPLIED CONTACT IS OPEN, THE TRANSFER SWITCH WILL AUTOMATICALLY RETRANSFER TO THE NORMAL SOURCE.

EXTERNAL FEATURE 6B: REMOTE BYPASS OF RETRANSFER TO NORMAL TIME DELAY - REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT BYPASSES FEATURE 3A RETRANSFER TO NORMAL DELAY IF ACTIVE.

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR SETTING INFORMATION.

ACCESSORIES

REFER TO USER'S GUIDE, ASCO GROUP G CONTROLLER FOR AUTOMATIC & NON-AUTOMATIC TRANSFER SWITCHES, PART NUMBER 381333-400 FOR SETTING INFORMATION.

Job Name: Lockport Pump Station
ATS Name:
Catalog No.: G03ATSA31600NGXC.11BE.18RX

CATALOG NUMBER SUFFIXES										EXPLANATION OF CATALOG NUMBER CODES									
TS	CATALOG	NEUTRAL	PHASE	AMPS	VOLT	CONTROLLER	OPTIONAL	ENCLOSURE		NEUTRAL	VOLTAGE	ENCLOSURE		DESCRIPTION					
FRAME	TYPE	TYPE	POLES		CODE		ACCESSORY	CODE		CODE	CODE	TYPE	DESCRIPTION	TYPE	DESCRIPTION	TYPE	DESCRIPTION		
				1000	C					A	SOLID	BLANK	OPEN TYPE (NO ENCLOSURE)						
				1200	D					B	SWITCHING	C	1	GENERAL PURPOSE, INDOOR					
				1600	E							F	3R	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT					
				2000	F							G	4	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT					
				2600	G							H	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)					
				3000	H							L	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT					
				3200	I							M	3R	(SECURE ENCLOSURES)					
					J							N	4	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT					
					K							O	4X	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT					
					L							P	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)					
					M							Q	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT					
					N														
					O														
					P														
					Q														
					R														

CATALOG NUMBER _____
BY _____
DATE _____

FORM REV J

PROJECT NAME: _____

WIRING _____ DIAGRAM _____

300 SERIES (G3ATS/G3NTS) 3PH 1000-3200 AMPS
"G" FRAME, GROUP G CONTROLS

SCALE: NONE SIZE DS

COMPUTER GENERATED DRAWING

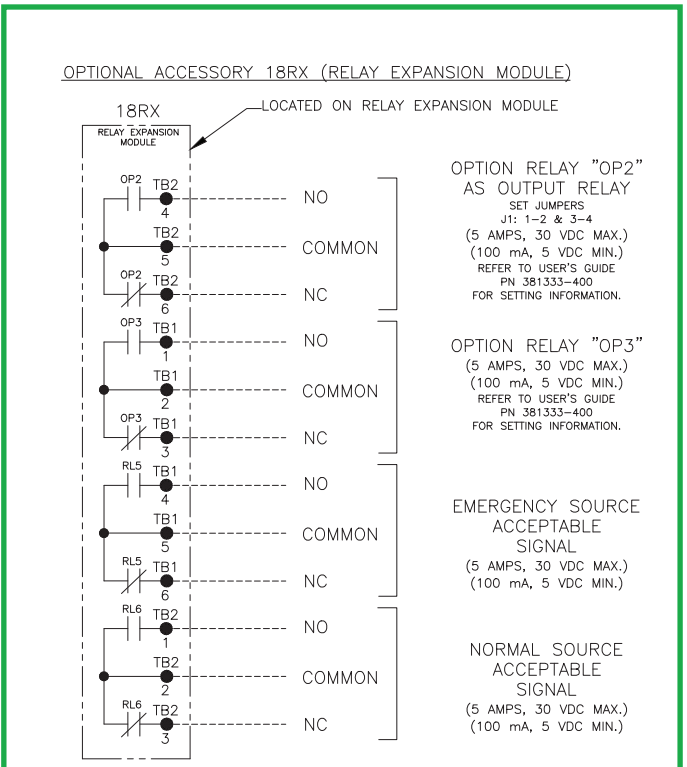
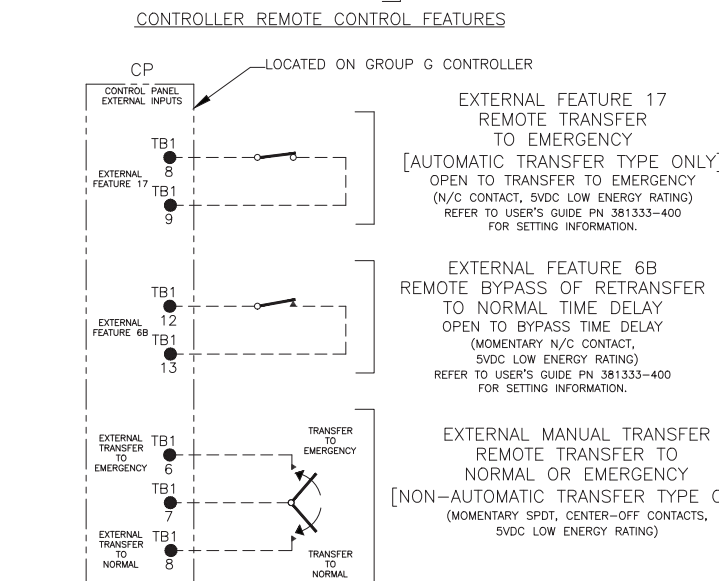
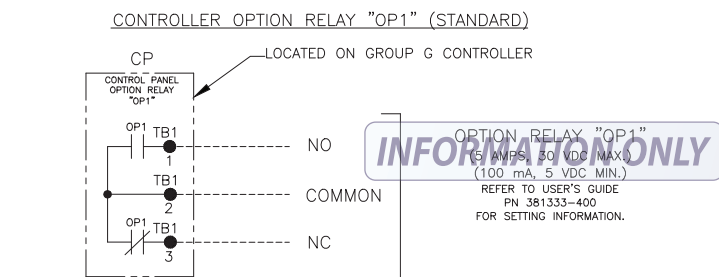
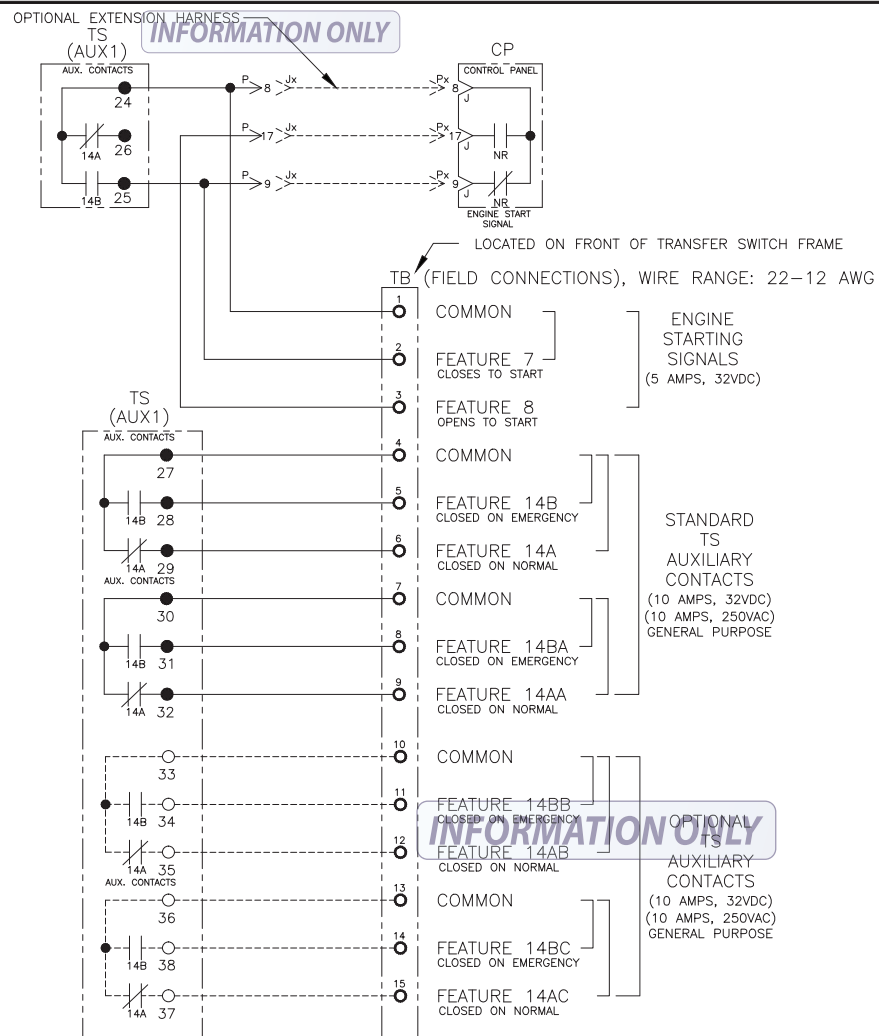
ASCO® CERTIFIED TO S.O. _____

ASCO Power Technologies, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

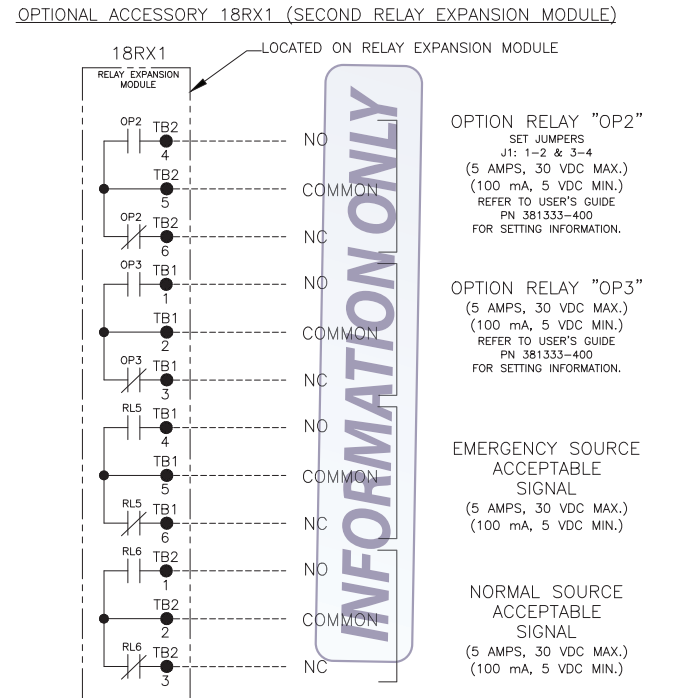
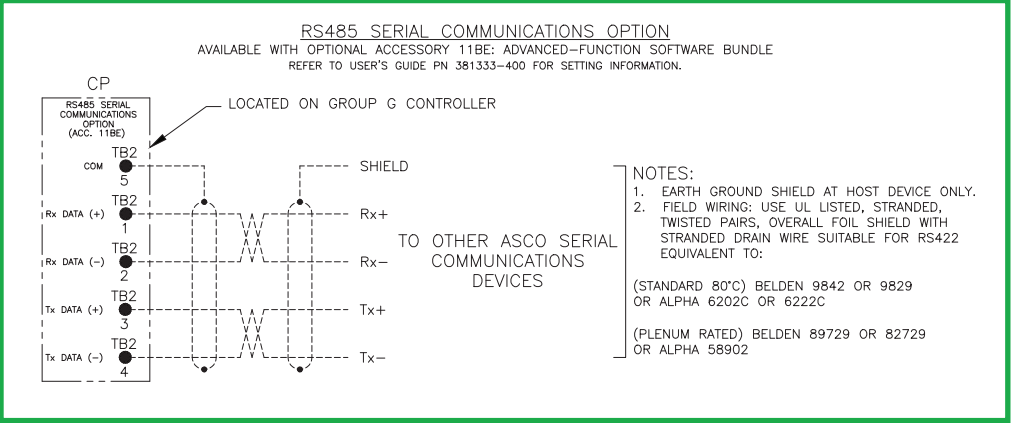
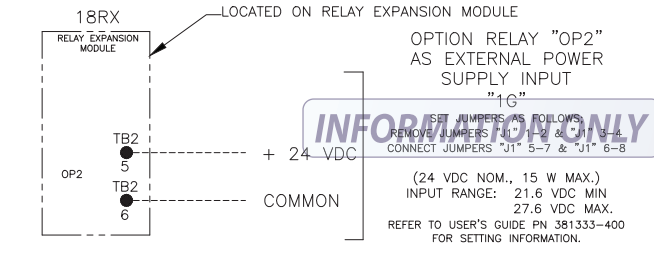
DRAWING J ECN 275211 SHEET 1 OF 7

J	275211	TR	BK	10/15/18
SEE ECN				
H	265313	TR	BK	1/31/17
SHT 4 SINGLE PHASE EMGR.				
G	254970	TR	BK	05/26/15
SEE ECN				
F	252347	MPP	AB	12/22/14
SEE ECN				
E	247772	SDH	SDH	4/14/14
SEE ECN				
D	247048	TR	BK	3/4/14
SEE ECN				
C	246325	AE	BK	01/16/14
SEE ECN				
B	246211	AE	BK	01/10/14
SEE ECN				
A	245959	BK	BK	12/23/13
SEE ECN				
-	245072	BK	BK	10/28/13
ISSUE				

FIELD CONNECTIONS



"OP2" OPTIONAL USES



INFORMATION ONLY

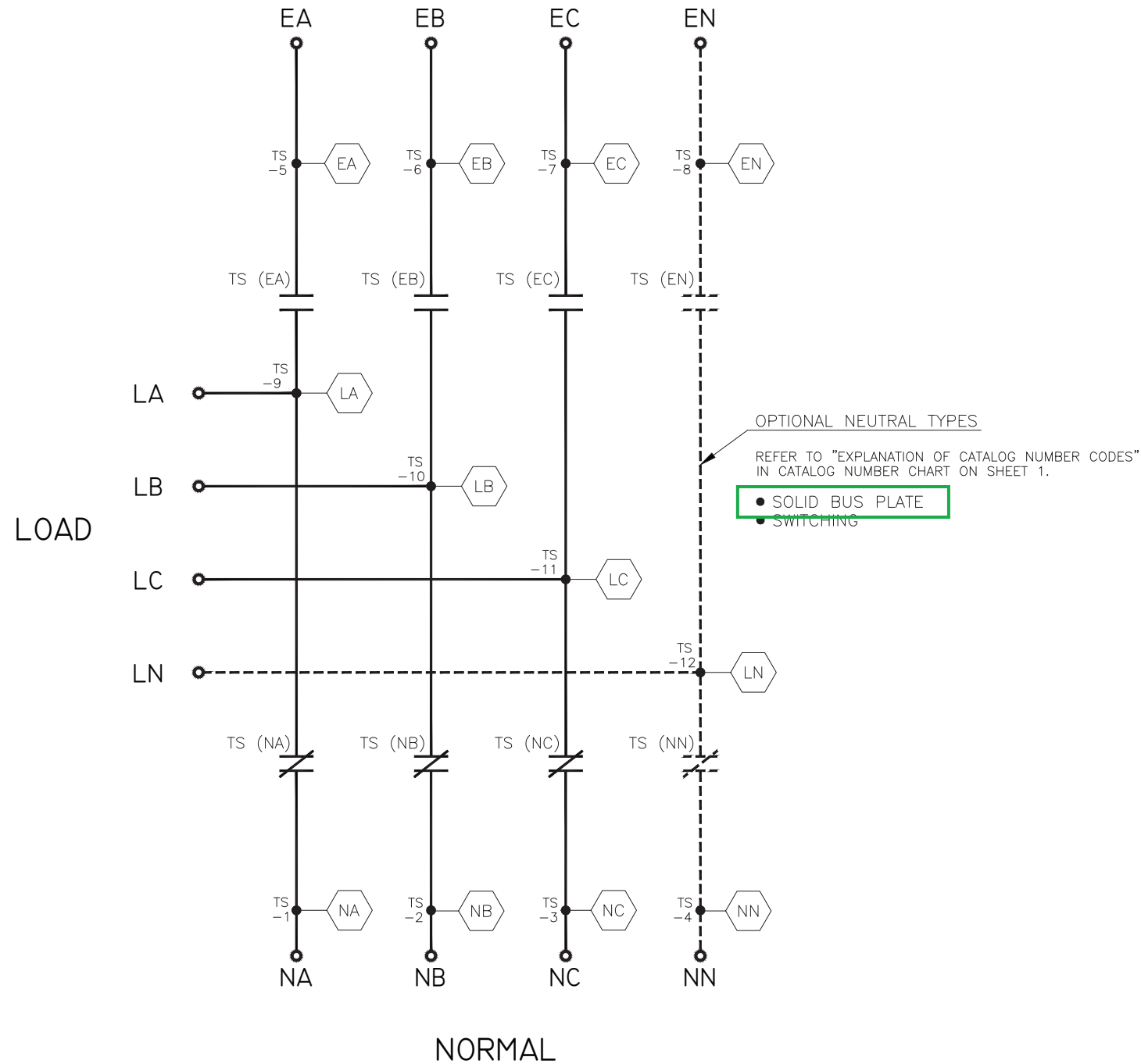
PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING DIAGRAM		J	275211	TR	BK	10/15/18
300 SERIES (G3ATS/G3NTS) 3PH 1000-3200 AMPS		SEE ECN				
"G" FRAME, GROUP G CONTROLS		H	265313	TR	BK	1/31/17
		SHT 4 SINGLE PHASE EMGR.				
		G	254970	TR	BK	05/26/15
		SEE ECN				
MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005.		ASSEM. REF. NO.		COMPUTER GENERATED DRAWING		
PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE		NONE		
DRAWN BY: DJB 10/28/13		SIZE		DS		
CHECKED BY: BK 10/28/13		DWG. NO.		1001662		
PROJECT APPROVAL BY: BK 10/28/13		DRAWING J		ECN 275211		
FINAL APPROVAL		REV.		SHEET 2 OF 7		
ASCO ASCO POWER TECHNOLOGIES, L.P. FLOHAM PARK, NEW JERSEY 07932 U.S.A.						

MAIN POWER POLES

TS OPERATOR CIRCUIT

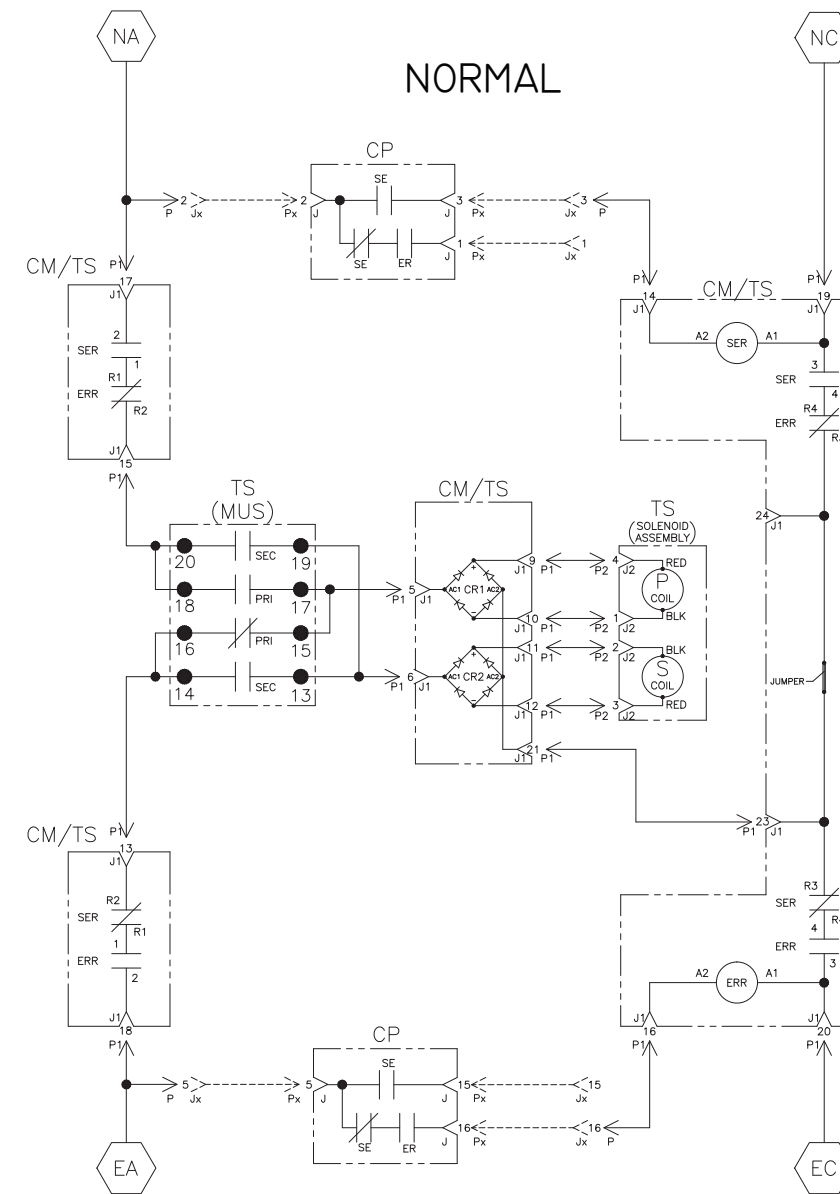
EMERGENCY

NORMAL



NORMAL

NOTE:
 ATS/NTS SHOWN CLOSED ON NORMAL SOURCE.



EMERGENCY

TS (MUS) CONTACTS		SOLENOID POSITION				
MUS		NORM	>	AFTER TDC	<	EMER
13-14						
15-16						
17-18						
19-20						

* AFTER SOLENOID PASSES THROUGH TOP DEAD CENTER POSITION.

PROJECT NAME: WIRING DIAGRAM
 300 SERIES (G3ATS/G3NTS) 3PH 1000-3200 AMPS
 "G" FRAME, GROUP G CONTROLS

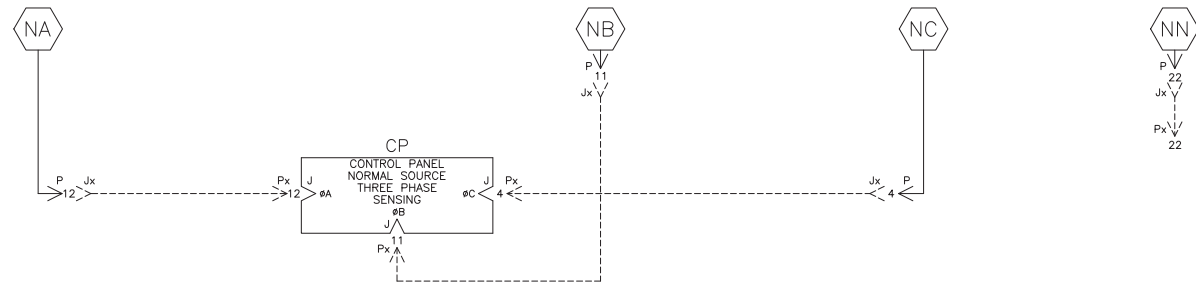
REV. TO SHEET	ECN NO.	BY	APP.	DATE
J	275211	TR	BK	10/15/18
H	265313	TR	BK	1/31/17
G	254970	TR	BK	05/26/15

SCALE: NONE SIZE DS
 DWG. NO. 1001662
 DRAWING J ECN 275211 SHEET 3 OF 7

ASCO POWER TECHNOLOGIES, L.P.
 FLORHAM PARK, NEW JERSEY 07932 U.S.A.

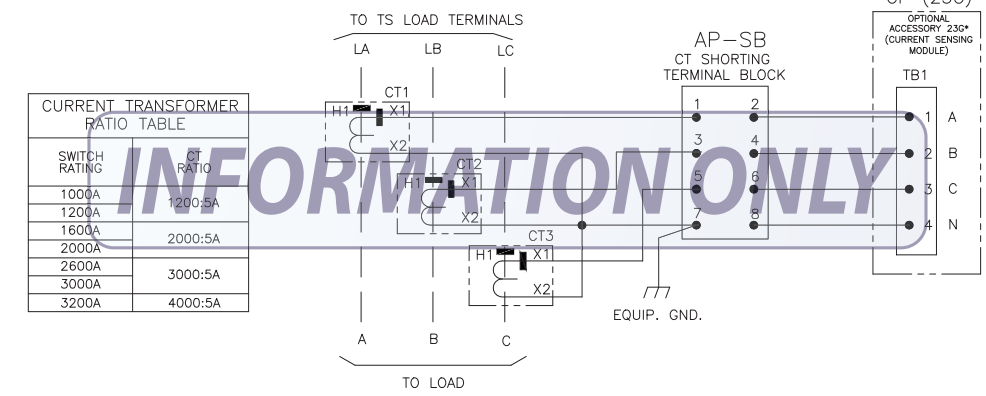
NORMAL SOURCE CIRCUITS

NORMAL



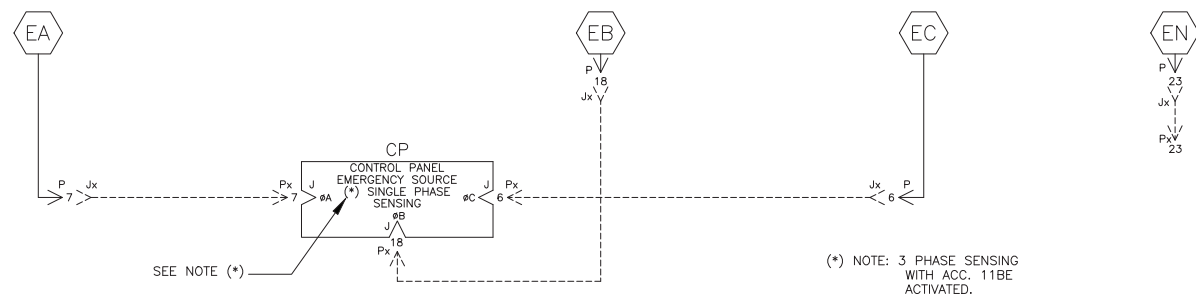
ADDITIONAL CIRCUITS

OPTIONAL ACCESSORY 23GB (LOAD CURRENT METERING)



EMERGENCY SOURCE CIRCUITS

EMERGENCY



SEE NOTE (*)

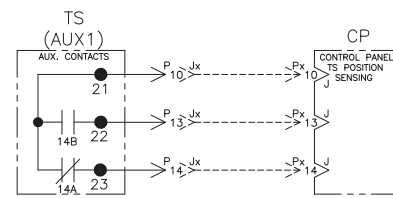
(*) NOTE: 3 PHASE SENSING WITH ACC. 11BE ACTIVATED.

LOAD TERMINAL CIRCUITS

LOAD



CONTROL SIGNALS & INDICATION



J	275211	TR	BK	10/15/18
	SEE ECN			
H	265313	TR	BK	1/31/17
	SHT 4 SINGLE PHASE EMGR.			
G	254970	TR	BK	05/26/15
	SEE ECN			

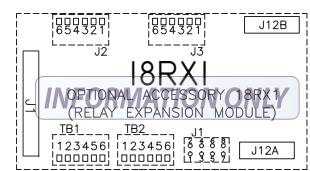
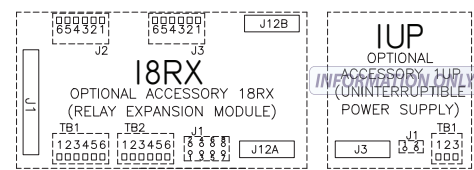
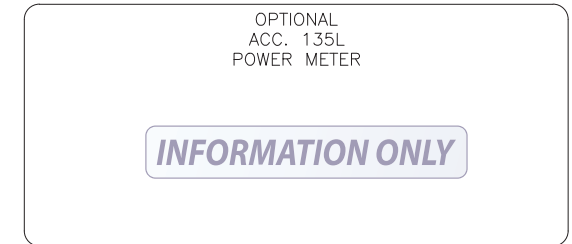
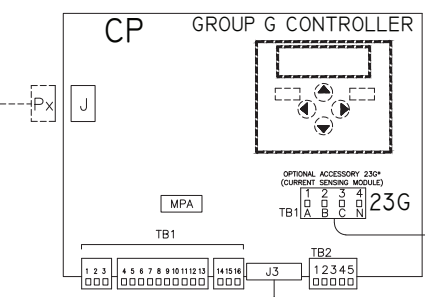
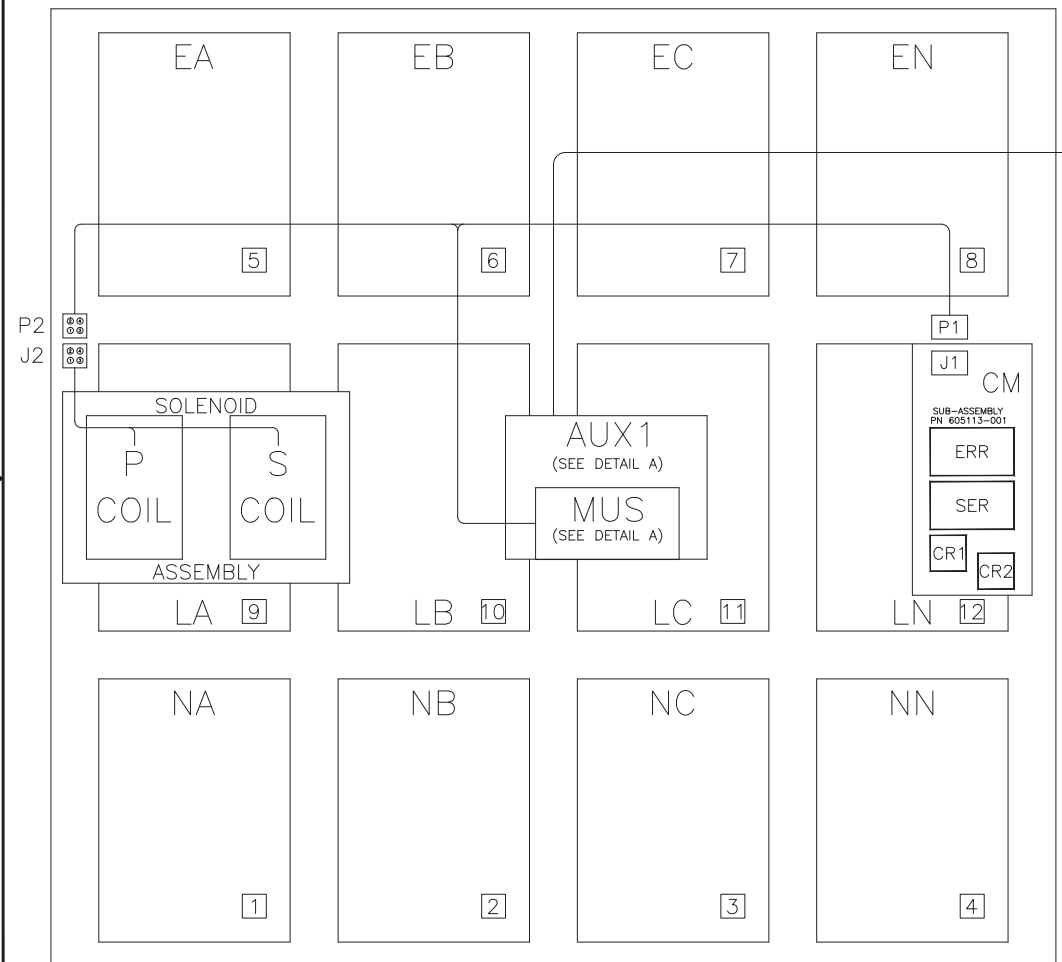
PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING DIAGRAM						
300 SERIES (G3ATS/G3NTS) 3PH 1000-3200 AMPS						
"G" FRAME, GROUP G CONTROLS						
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.	COMPUTER GENERATED DRAWING	
DJB	10/28/13				SCALE	SIZE DS
CHECKED	BK	PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.			DWG. NO.	
PROJECT APPROVAL	BK				1001662	
FINAL APPROVAL					DRAWING J	ECN NO. 275211 SHEET 4 OF 7
		ASCO		ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		

PHYSICAL DIAGRAM

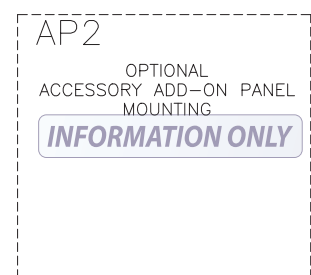
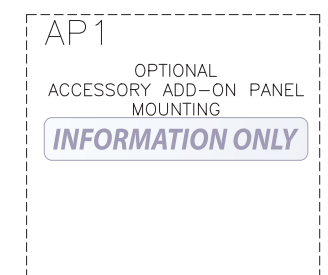
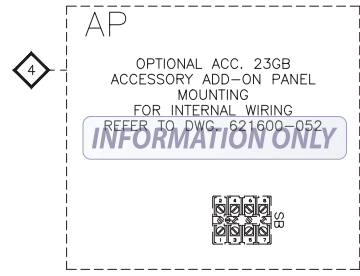
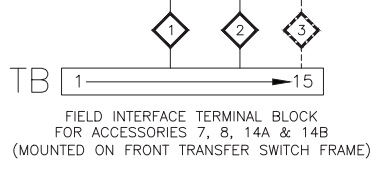
ENCLOSURE

DOOR, INSIDE

TS (TRANSFER SWITCH)

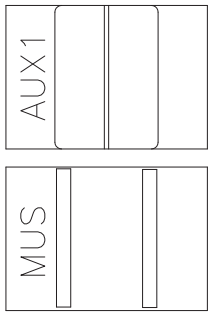


OPTIONAL ACCESSORY 23GB TO AP-SB
TO FIRST OPTIONAL ACCESSORY 18RX (J12A OR J12B) OR 1UP (J3) [1UP MUST BE LAST ACCESSORY IN CHAIN] USE INFORMATION ONLY FOR EACH CONNECTION



NOTE: PHYSICAL MAY VARY BASED ON ENCLOSURE PROVIDED.

DETAIL A
MUS & AUX1
TOP VIEW



J	275211	TR	BK	10/15/18
SEE ECN				
H	265313	TR	BK	1/31/17
SHT 4 SINGLE PHASE EMGR.				
G	254970	TR	BK	05/26/15
SEE ECN				

PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING DIAGRAM						
300 SERIES (G3ATS/G3NTS) 3PH 1000-3200 AMPS "G" FRAME, GROUP G CONTROLS						
DRAWN BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005		ASSEM. REF. NO.	COMPUTER GENERATED DRAWING	
CHECKED	DATE	PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE	NO.	SIZE DS
PROJECT APPROVAL	DATE			DWG. NO.		
FINAL APPROVAL	DATE			1001662		
		ASCO POWER TECHNOLOGIES, L.P.		DRAWING J		SHEET 5 OF 7
		FLORHAM PARK, NEW JERSEY 07932 U.S.A.		ECN NO. 275211		

PHYSICAL DIAGRAM (CONTINUED)

REAR CONNECTED SWITCH
1000 - 3200 AMP. TS REAR VIEW

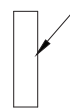
OPTIONAL ACCESSORY 23GB
(LOAD CURRENT METERING)

MAIN BUS STABS/TERMINALS (TYPICAL)

EN
EMERGENCY
NEUTRAL



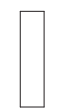
EC
EMERGENCY
PHASE C



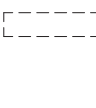
EB
EMERGENCY
PHASE B



EA
EMERGENCY
PHASE A



LN
LOAD
NEUTRAL



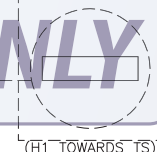
LC
LOAD
PHASE C



LB
LOAD
PHASE B



LA
LOAD
PHASE A



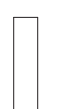
INFORMATION ONLY

TO SB (AP)

NN
NORMAL
NEUTRAL



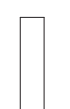
NC
NORMAL
PHASE C



NB
NORMAL
PHASE B



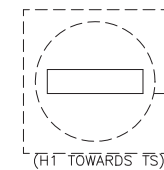
NA
NORMAL
PHASE A



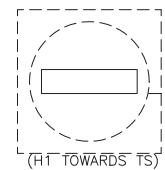
FRONT CONNECTED SWITCH
1000 - 2000 AMP. TS TOP VIEW

OPTIONAL ACCESSORY 23GB
(LOAD CURRENT METERING)

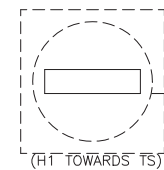
LA
LOAD
PHASE A



LB
LOAD
PHASE B



LC
LOAD
PHASE C



LN
LOAD
NEUTRAL



STANDARD:
EMERGENCY & LOAD OUT
OF THE TOP AND NORMAL
OUT THE BOTTOM.

TO SB (AP)

MAIN BUS STABS/TERMINALS (TYPICAL)

EA
EMERGENCY
PHASE A



EB
EMERGENCY
PHASE B



EC
EMERGENCY
PHASE C



EN
EMERGENCY
NEUTRAL



BOTTOM VIEW

NA
NORMAL
PHASE A



NB
NORMAL
PHASE B



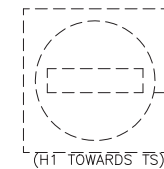
NC
NORMAL
PHASE C



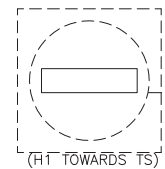
NN
NORMAL
NEUTRAL



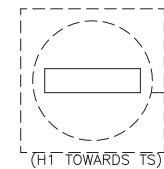
LA
LOAD
PHASE A



LB
LOAD
PHASE B



LC
LOAD
PHASE C



LN
LOAD
NEUTRAL



OPTIONAL:
EMERGENCY OUT OF THE TOP
AND NORMAL & LOAD
OUT THE BOTTOM.

TO SB (AP)

J	275211	TR	BK	10/15/18
SEE ECN				
H	265313	TR	BK	1/31/17
SHT 4 SINGLE PHASE EMGR.				
G	254970	TR	BK	05/26/15
SEE ECN				

PROJECT NAME:		DIAGRAM		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING		300 SERIES (G3ATS/G3NTS) 3PH 1000-3200 AMPS						
"G" FRAME, GROUP G CONTROLS		MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005.		ASSEM. REF. NO.		COMPUTER GENERATED DRAWING		
DRAWN BY	DJB	DATE	10/28/13	SCALE	NONE	SIZE	DS	
CHECKED	BK	DATE	10/28/13	PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				DWG. NO.
PROJECT APPROVAL	BK	DATE	10/28/13	DRAWING J				1001662
FINAL APPROVAL		DATE		ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.				ECN NO. 275211 SHEET 6 OF 7

Limited Warranty

Series 150, 200, 300 and 4000 Power Transfer Switches

This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser's business.

General

ASCO Power Technologies, LP products and systems are in our opinion the finest available. We take pride in our products and are pleased that you have chosen them. Under certain circumstances we offer with our products the following Limited Guardian Warranty Against Defects in Material and Workmanship.

Please read your Guardian Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

Limited Warranty Against Defects in Material and Workmanship:

Product Description	Series	Catalog Code
Automatic Transfer Switch	150, 200	1ATS, 2ATS
	300	3ATS, 3ADTS
	4000	4ATS, 4ADTS, 4ACTS
Non-Automatic Transfer Switch (Electrically Operated)	300	3NTS, 3NDTS
ASCO Lighting Control Panels	4000	4NTS, 4NDTS, 4NCTS
Manual Transfer Switch	300	3MTS, 3MTQ, 3MUQ, 3MPQ, 3MGQ, 3MGDQ, 3MTDQ
Service Entrance Transfer Switch (SEATS)	300	3AUS, 3ADUS, 3APS, 3ARS, 3MUS
Power Transfer Load Center (PTLC)	300	300L
Quick Connect Panels	300	3QCN, 3QCU, 3QCD
Electrically Operated Bypass Switch	4000	4ATE, 4NTE, 4ADTE, 4NDTE

Limited Warranty

ASCO warrants that the ATS will be free from defects in material and workmanship and will conform to ASCO's standard specifications for the ATS for a period of twenty four (24) months from date of product shipment from ASCO (the "Warranty Period"). This Limited Warranty does not extend to subsequent owners of the structure during the Warranty period.

Terms of Warranty

The foregoing Limited Warranty is conditioned upon user's compliance with the following:

1. The ASCO Power Transfer Switch is installed in accordance with ASCO specifications and state and local codes and standards by an electrician licensed in the state of installation.
2. The ASCO Power Transfer Switch is maintained in accordance with ASCO instructions and used under normal conditions for the purposes intended by ASCO.

All warranty field-related repairs, replacements or adjustments must be made by ASCO Services Inc. or its duly authorized representative.

Optional Available Extended Warranty

Optional extended warranty coverage may be purchased from ASCO for a specified fee at the time of the original sale. If purchased, Warranty period shall be extended up to an additional thirty - six (36) months beyond the standard twenty - four (24) months to provide up to five (5) year coverage applicable to the above referenced products, except for 3AUS, 3APS, and 3ARS products where the warranty period for the circuit breaker shall be limited to 24 months from date of shipment from ASCO. The length of optional extended coverage shall be reflected on the ASCO invoice and/or order acknowledgement document.

INFORMATION ONLY

**Warranty Extends
To First Purchaser
for Use,
Non-Transferable**

This Warranty is extended to the first person, firm, association, or corporation for whom the ASCO product specified herein is originally installed for use (the "user") in the fifty United States or Canada. This Warranty is not transferable or assignable without the prior written permission of ASCO.

**Assignment of
Warranties**

ASCO assigns to user any warranties which are made by manufacturers and suppliers of components of, or accessories to, the ASCO product and which are assignable, but ASCO makes no representations as to the effectiveness or extent of such warranties, assumes no responsibility for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components or accessories.

**Drawings,
Descriptions**

ASCO warrants for the period and on the terms of the Warranty set forth herein that the ASCO product will conform to the descriptions contained in the certified drawings, if any, applicable thereto, to ASCO's final invoices, and to applicable ASCO product brochures and manuals current as of the date of product shipment ("descriptions"). ASCO does not control the use of any ASCO product. Accordingly, it is understood that the descriptions are not Warranties of performance and not Warranties of fitness for a particular purpose.

**Warranty Claims
Procedure**

Within a reasonable time, but in no case to exceed thirty (30) days, after user's discovery of a defect, user shall contact ascopowerwarranty@ascopower.com. Subject to the limitations specified herein, an ASCO Services field service representative will repair the non-conforming ASCO product warranted hereunder, without charge for parts, labor, or travel expenses. Warranty coverage will apply only after ASCO's inspection discloses the claimed defect and shows no signs of treatment or use that would void the coverage of this Warranty . All defective products and component parts replaced under this Warranty become the property of ASCO.

**Warranty
Performance of
Component
Manufacturers**

It is ASCO's practice, consistent with its desire to remedy Warranty defects in the most prompt and effective manner possible, to cooperate with and utilize the services of component manufacturers and their authorized representatives in the performance of work to correct defects in the product components. Accordingly, ASCO may utilize third parties in the performance of Warranty work, including repair or replacement hereunder, where, in ASCO's opinion, such work can be performed in less time, with less expense, or in closer proximity to the ASCO product.

**Items Not Covered
By Warranty**

This Warranty does not cover damage or defect caused by misuse, improper application, wrong or inadequate electrical current or connection, negligence, inappropriate on site operating conditions, repair by non-ASCO designated personnel, accident in transit, tampering, alterations, a change in location or operating use, exposure to the elements, water, or other corrosive liquids or gases, acts of God, theft or installation contrary to ASCO's recommendations or specifications, or in any event if the ASCO serial number has been altered, defaced, or removed.

This Warranty does not cover shipping costs, installation costs, external circuit breaker resetting or maintenance or service items and further, except as may be provided herein, does not include labor costs or transportation charges arising from the replacement of the ASCO product or any part thereof or charges to remove or reinstall same at any premises of user.

Repair or replacement of a defective product or part thereof does not extend the original Warranty period.

The products listed in this Warranty are not for use in the control area or any reactor connected or safety applications or within the containment area of a nuclear facility or for integration into medical devices.

Limitations

This Warranty is in lieu of and excludes all other Warranties, express or implied, including merchantability and fitness for a particular purpose.

User's sole and exclusive remedy is repair or replacement of the ASCO product as set forth herein.

If user's remedy is deemed to fail of its essential purpose by a court of competent jurisdiction, ASCO's responsibility for property loss or damage shall not exceed the net product purchase price.

In no event shall ASCO assume any liability for indirect, special, incidental, consequential or exemplary damages of any kind whatsoever, including without limitation lost profits, business interruption or loss of data, whether any claim is based upon theories of contract, negligence, strict liability, tort, or otherwise.

Miscellaneous

No salesperson, employee, or agent of ASCO is authorized to add to or vary the terms of this Warranty. Warranty terms may be modified, if at all, only in writing signed by an ASCO officer.

ASCO obligations under this Warranty are conditioned upon ASCO timely receipt of full payment of the product purchase price and any other amounts due. ASCO reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to user or others.

In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the Warranty period, the remaining terms and provisions shall continue in full force and effect.

This Warranty shall be governed by, and construed under, the laws of the State of New Jersey, without reference to the conflict of laws principles thereof.

This Warranty represents the entire agreement between ASCO and user with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings, or agreements relating to this subject.

EQUIPMENT STORAGE REQUIREMENTS

Equipment provided by Schneider-Electric and/or ASCO Power Technologies that is stored for a short-term duration (i.e., days to weeks) or long-term duration (i.e., months to years), must be kept in a cool, dry, temperature-controlled environment. Storage of equipment in open warehouses, locations without proper temperature and humidity control, and/or outdoor storage is not acceptable without the utilization of heating elements, thermostats, humidistats, and protection from weather and dirt. Failure to comply may result in moisture ingress and/or condensation to form resulting in rusting and or corrosion, component and/or equipment failure and replacement, and/or nullification of any manufacturer warranty.

For **General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less**, refer to [ANSI NEMA PB 2.1-2013](#)

Copies of the following documents should be included on the submittals, depending on the units that are on the proposal:

For ASCO Power Technology's **Switchgear and Switchboards**, refer to Instruction Bulletin **381333-393**.

For Schneider-Electric/Square D's **Power Zone 4 (PZ4) Switchgear**, refer to Instruction Bulletin **80298-002-09**.

For Schneider-Electric/Square D's **Power Zone 4 (PZ4) NEMA 3R Walk-In Switchgear**, refer to Instruction Bulletin **80298-156-02**.

For Schneider-Electric/Square D's **Quality, Efficient, Delivery" (QED2) Switchboard**, refer to Instruction Bulletin **80043-055-14**.

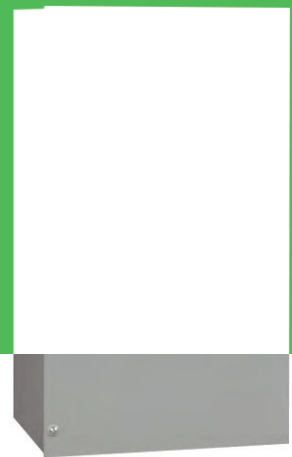
For Schneider-Electric/Square D's **Masterclad Metal-Clad Indoor Switchgear**, refer to Instruction Bulletin **6055-30**.



Flexible Power Transfer Solutions for Commercial & Industrial Applications

ASCO Power
Technologies™

ASCO SERIES 300
Power Transfer Switches



ascopower.com

Life Is On

Schneider
Electric

ASCO SERIES 300 Automatic Transfer Switches

Power outages impact small and large facilities alike. ASCO SERIES 300 Automatic Transfer Switches offer rugged design and reliable performance to small and mid-size commercial and industrial facilities in packaged solutions that are easy to select, procure, install, and operate.

Every SERIES 300 generator transfer switch is engineered with ASCO's reliability expertise in a package that makes backup power accessible for small and mid-size facilities. Leveraging knowledge derived from a century of critical power transfer experience, each SERIES 300 is backed by the same ASCO technical support and service that solves the most demanding critical power challenges facing facilities today.

Product Details

Transfer Switch Overview

SERIES 300 Automatic Transfer Switches

Designed to Fit Anywhere

The ASCO SERIES 300 product line provides the most compact design of generator power transfer switches in the industry.

Available to mount on walls or floors, all models through 2000 amperes are designed to be completely front-accessible. This permits installation flush against walls while allowing installation of cabling and connections from the front of the switch. Cable entrance plates are standard on 1600 and 2000 amperes units; these allow use of optional side-mounted pull boxes for additional cable bending space.

- 30 through 3000 amperes in compact designs
- Up to 600 VAC, single or three phase
- Listed to UL 1008 - Standard for Safety - Transfer Switch Equipment
- True double-throw operation: The single solenoid design is inherently interlocked to prevent simultaneous connections of two power sources.
- Will not transfer to a dead source - single solenoid operator derives power from the destination source
- Easy-to-navigate 128x64 graphical LCD display with keypad provides LED indicators for switch position, source availability, not-in-auto mode, and alert conditions.
- Integrated, multilingual, user interface for configuration and monitoring
- Available Delayed Transition operation
- Non-automatic operation can be selected without opening enclosure door
- Optional Relay Expansion Module with extra relays for accessory outputs
- Soft keys for test function and time delay bypass
- Emergency source failure alert indication
- Optional Historical Event Log
- Displays statistical ATS monitoring information
- Built-in diagnostic functions
- Password protection to prevent unauthorized actions
- Adjustable delay feature prevents nuisance transfer due to momentary utility power outages and generator dips
- Auxiliary contacts signal position of main contacts - two for normal and two for emergency position
- Standard solid neutral terminals
- Restriction of Hazardous Substances (RoHS) compliant controller
- Standard 2 year warranty. Optional 1, 2, and 3 year extensions

Power Knowledge

Basic Automatic Transfer Switch Functions



SERIES 300 Power Transfer Switch rated 200 amps



ASCO's SERIES 300 lineup offers flexible backup power solutions for businesses of every size.

SERIES 300 Automatic Switching Solutions

Automatic and Non-Automatic Transfer Switching

ASCO Transfer Switches are available in both automatic and non-automatic types. Both are electrically operated. For automatic transfer switches, the controller initiates transfer between power sources. For non-automatic transfer switches, a user initiates transfer using local or remote controls.

SERIES 300 non-automatic transfer switches offer the following features:

- Models range from 30 through 3000 amperes, up to 600V
- Controller prevents inadvertent operation under low voltage conditions
- Source acceptability lights inform operator when sources are available to accept load
- Standard in-phase monitor for transferring motor loads between live sources

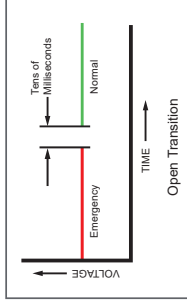
Power Knowledge

Non-Automatic and Manual Transfer Switches for Backup Power Applications

Open Transition Transfer Switching

ASCO Transfer Switches are available with a standard, 2-position, open transition models that reliably transfer loads in less than 100 milliseconds. Open transition switches are suitable for a wide range of applications.

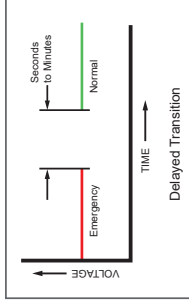
- 30 to 3000 amps
- Single-operator switching mechanism prevents simultaneous connection of both sources
- Available In-Phase Monitor can be activated for transferring motor loads



Delayed Transition Transfer Switching

ASCO Delayed Transition Transfer Switches transfer loads between power sources using a timed load disconnect position with an adjustable delay.

- 150 through 3000 amps
- Reliable, field-proven, dual-solenoid operating mechanism
- Mechanical interlocks to prevent simultaneous connection of both power sources
- Adjustable delay for load disconnect - 0 to 5 minutes
- Non-automatic models available in manual operation configuration
- Automatic models available with load shed feature



SERIES 300 Group G Controller

The SERIES 300 Group G Controller is reliable and field-proven. It provides all of the voltage, frequency, control, timing, and diagnostic functions required for most emergency and standby power applications.



- Touch pad programming
- Displays active timers
- On-board diagnostics
- Password protection
- Voltage and frequency sensing
- Status and control functions

Power Knowledge

Transition Mode Basics

Transferring Motor Loads between Power Sources

Transferring Loads with Zero Power Interruption

Product Details

Group G Controller



Transfer Switch Communications and Metering

Options to Customize Functionality and Increase Value

Product Details

5300 SERIES Annunciators

Monitoring and control transfer switches from across the room, building, or from Internet.

5310 – LED annunciator – Single ATS

5350 – LED annunciator – up to 8 ATSs



Remote Annunciation

Monitor Power Equipment Status from Anywhere

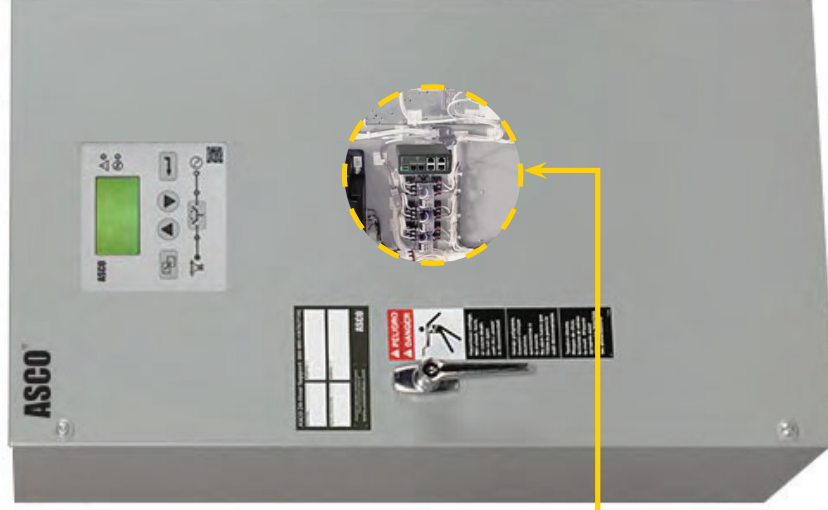
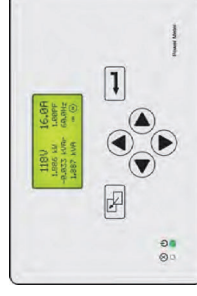
Product Details

5210 Power Meter

Metering

Transfer Switches are the Perfect Place to Monitor Power Flow, Power Conditions, and Power Events

5210 Power Meter – Provides deeper insight into circuit status and conditions.



Product Details

5140 Connectivity Module

Turn Transfer Switches into Power Information Portals

5140 Connectivity Module – Makes status and power information from a single switch available to via ModBUS, SNMP, and web pages.



Communication

SERIES 300 Optional Accessories

Communications	
11BE	Feature Bundle - Programmable engine exerciser with seven independent routines run the generator with or without loads, on a daily, weekly, bi-weekly, or monthly basis. Controlled from the user interface keypad. <ul style="list-style-type: none"> Event log display shows the event number, time and date, type and reason (if applicable). Stores up to 300 events RS485 Communication Port enabled common alarm output contact On three-phase systems, Accessory 11BE enables line-to-line voltage imbalance sensing and three-phase sensing capabilities for the Emergency power source as well as the Phase Rotation checking for both power sources.
18RX	Relay Expansion Module provides accessory relays and includes one Form C contact for normal source availability (18G), and one Form C contact for emergency source availability (18B) (contact rating 5 amperes @ 30 VDC or @ 125 VAC resistive (100 ma, 4 VDC min) Additional output relay is provided the default is to indicate a common alarm.
72EE	Connectivity module provides remote monitoring and control capabilities and includes accessory 11BE feature bundle
Environment and Power	
44A	Strip heater with thermostat for cold environment to prevent internal condensation and icing. External 120-volt AC power source required.
44G	Strip heater with thermostat, wired to load terminals on 208-240, 360-380, 460-480, 550-600 volt models. Contains wiring harnesses for all transfer switch sizes.
1UP	UPS back-up power runs controller and LCD display for 30 seconds without AC power
Extension Harness	
37B	Six-foot extension harness for open type units to accommodate customer mounting of controls and switch
37C	Nine-foot extension harness for open type units to accommodate customer mounting of controls and switch
Indicators	
62W	Audible alarm with silencing feature to signal transfers to emergency. (For D-frame models, may require oversize enclosure depending on accessory combination).
Customer Control Circuits	
30A	Load-shed circuit initiated by opening of a customer-supplied contact (Open Transition model only)
30B	Load-shed circuit initiated by removal of customer-supplied control voltage (Open Transition model only)
30AA	Load-shed circuit initiated by opening of a customer-supplied contact (Delayed Transition model only)
30BA	Load-shed circuit initiated by removal of customer-supplied control voltage (Delayed Transition model only)
Surge Protection	
73	Surge suppressor rated 65 kA
Metering	
23GA	Load Current Meiring card measures either single or three-phase load current. Not available with Power Meter option
23GB	135L Use 23GA for Single-Phase, 23GB for Three-Phase.
135L	Power Meter on load side (includes shunting block and current transformers). Not available with Load Current Metering options 23GA or 23GB.

Field Conversion Kits

Kit No.	Description
935147	Advanced Function Bundle Retrofit Kit (11BE) - See above accessory 11BE description for details.
935148	REX Module with Source Availability Contacts (Acc. 18RX)
935149	UPS to allow controller to run for 30 seconds minimum without AC Power (Acc. 1UP)
935150	1/3 Phase load current sensing card only (Acc. 23GA/GB)
K613127-001	Strip Heater (125 watt) 120 volt (Acc. 44A)
K613127-002	Strip Heater (125 watt) 208-480 volt (Acc. 44G)
948551	Quad-Ethernet Module (Acc. 72EE)
K609027	Cable Pull Box (1600-2000 amperes)

Withstand and Closing Ratings

FRAME	RATINGS AMPERES	CURRENT LIMITING FUSES			SPECIFIC BREAKER		
		480V MAX.	800V MAX.	CLASS	240V MAX.	480V MAX.	600V MAX.
D	30	100A	-	300	J	22kA	10kA
		200kA	35kA	200	J	22kA	10kA
		35kA	35kA	200	RK1		
	70-100	35kA	35kA	200	RK1	150kA	25kA
		200kA	35kA	200	J	150kA	25kA
		35kA	35kA	200	RK1		
E	150	200kA	35kA	200	J	150kA	85kA
		200kA	35kA	200	J	200kA	85kA
		35kA	35kA	200	RK1		
	200	200kA	35kA	200	J	200kA	85kA
		200kA	35kA	200	RK1		
		35kA	35kA	200	J	200kA	85kA
J	200	100kA	-	300	J	200kA	85kA
		200kA	200kA	600	J	65kA	42kA
		200kA	200kA	800	J	200kA	200kA
	400	200kA	200kA	800	L	200kA	42kA
		200kA	200kA	800	L	65kA	50kA
		200kA	200kA	800	L	65kA	85kA
H	800-1200*	200kA	200kA	1200	L	65kA	150kA
		200kA	200kA	2500	L	85kA	85kA
		200kA	200kA	4000	L	125kA	100kA
	1600-2000	200kA	200kA	5000	L	100kA	100kA
		200kA	200kA	5000	L	100kA	100kA
		200kA	200kA	5000	L	100kA	100kA
G	2800-3000	200kA	200kA	5000	L	100kA	100kA
		200kA	200kA	5000	L	100kA	100kA
		200kA	200kA	5000	L	100kA	100kA
	4000	200kA	200kA	5000	L	100kA	100kA
		200kA	200kA	5000	L	100kA	100kA
		200kA	200kA	5000	L	100kA	100kA

Notes:

* Front connection only

All units are RMS Symmetrical Amperes

All Withstand and Closing Rating values are tested in accordance with UL 1008. See [ASCO Publication 1128](#) for more information.

Application requirements may permit higher WCR for certain switch sizes.

Power Knowledge

UL 1008 Withstand and Closing Ratings

Performance Testing for Transfer Switches

Additional SERIES 300 Product Information

Transfer Switches and Panels	Controls	Technical Information
Manual Transfer Switch	Group G Controller	Withstand and Closing Ratings
Manual Transfer Switch with Quick Connects		Weights and Dimensions and Ordering Info
Quick Connect Power Panel		Drawings
Dual Purpose Quick Connect Power Panel		Wiring Diagrams

SERIES 300 Manual Transfer Switching and Quick Connection Solutions

ASCO SERIES 300 Manual Transfer Switching and Quick Connection Solutions offer reliable service and application flexibility for a wide range of facilities.

Manual Transfer Switches



- Three-position, easy-to-use center-off switch
- Compact design - easy to install and maintain
- Designed to handle demands of motors and inrush currents

Power Knowledge

Differences Between Manual, Non-Automatic, & Automatic Transfer Switches

Product Details

SERIES 300 Manual Transfer Switch

Quick Connect Panels



- Listed to UL 1008 Transfer Switch Accessory standard
- Utilizes standard Cam-Lok™ receptacles for quick connections
- Standard Type 3R construction is weatherproof with or without cable
- Utilizes standard Series 16 Single Pole quick connect receptacles

Power Knowledge

NEC Requirement for Permanent Manual Switching Means

Product Details

SERIES 300 Quick Connect Power Panel

Manual Transfer Switches with Quick Connects



- The ASCO SERIES 300 Manual Transfer Switch with integrated Quick Connects provides a total temporary power connection and transfer solution
- Enables connection and control of a temporary or portable generator
- Provides a complete UL 1008-listed solution in a single unit

Product Details

SERIES 300 Manual Transfer Switch with Quick Connects

Dual-Purpose Manual Transfer Switches with Quick Connects



- Provides both supplemental backup power and load testing connectivity through a single device.
- Listed to UL 891 by ETL
- Utilizes standard Series 16 Single Pole quick connect receptacles

Product Details

SERIES 300 Dual Purpose Quick Connect Power Panel

Life Is On | **Schneider**
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