SPECIFICATIONS
FOR

Emergency Generator Replacement
T.G.C. Juvenile Justice Center

SAN ANGELO, TEXAS

(TOM GREEN COUNTY RFP 22-017)

ARCHITECT OF RECORD
37B WEST CONCHO
SAN ANGELO, TX 76903
(325) 653-2900

POWER SYSTEMS INC.
MEP CONSULTANT
(325) 659-2235

Issued for Permit and Construction
03-09-2022

Project Manual

PROJECT NO. 306-15-1121

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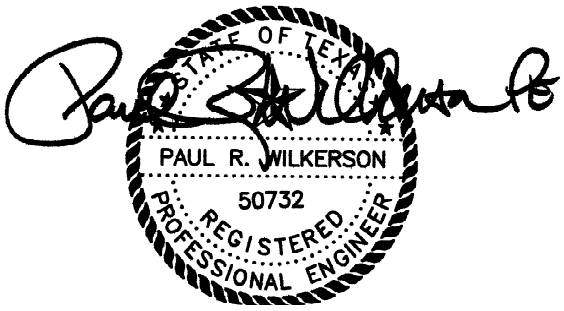
03-09-2022

PLUMBING, MECHANICAL & ELECTRICAL
SPECIFICATIONS



March 9, 2022

Paul Wilkerson, PE Texas # 50732
Power Systems
Firm #F-6257

SECTION 00 2116

GENERAL CONDITIONS FOR BIDDING

1. For General Conditions for Bidding – Refer to TGC RFP #22-017.

REQUEST FOR PROPOSAL

EMERGENCY GENERATOR REPLACEMENT
TOM GREEN COUNTY JUVENILE JUSTICE CENTER

1. For Request for Proposal – Refer to TGC RFP #22-017.

SECTION 00 6000

BID PROPOSAL FORM

PROPOSAL FOR LUMP SUM CONTRACT

1. For BID PROPOSAL FORM – Refer to TGC RFP #22-017.

SECTION 00 7300

SUPPLEMENTARY CONDITIONS

A. For Supplementary Conditions – Refer to TGC RFP #22-017.

SECTION 00 7343

PREVAILING WAGE RATES

1. For Prevailing Wage Rates – Refer to TGC RFP #22-017.

AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the _____ day of _____ in the year _____
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

The Architect:
(Name, legal status, address and other information)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement.

AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

The Owner and Contractor agree as follows.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

☐ The date of this Agreement.

☐ A date set forth in a notice to proceed issued by the Owner.

☐ Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

☐ Not later than ( ) calendar days from the date of commencement of the Work.

☐ By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

_____ % _____

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2017

☐ Litigation in a court of competent jurisdiction

☐ Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

☐ AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

☐ The Sustainability Plan:

Title	Date	Pages

☐ Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name and title)	*(Printed name and title)*

AIA® Document A101® – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the _____ day of _____ in the year _____
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201®–2017, General Conditions of the Contract for Construction. Article 11 of A201®–2017 contains additional insurance provisions.

THE OWNER:
(Name, legal status and address)

THE CONTRACTOR:
(Name, legal status and address)

TABLE OF ARTICLES

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's

property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Cause of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures
If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.
The Owner shall purchase and maintain the insurance selected and described below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

☐ **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance,** to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

☐ **§ A.2.4.2 Ordinance or Law Insurance,** for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

☐ **§ A.2.4.3 Expediting Cost Insurance,** for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

☐ **§ A.2.4.4 Extra Expense Insurance,** to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

☐ **§ A.2.4.5 Civil Authority Insurance,** for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

☐ **§ A.2.4.6 Ingress/Egress Insurance,** for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

☐ **§ A.2.4.7 Soft Costs Insurance,** to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

☐ **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

☐ **§ A.2.5.2 Other Insurance**

(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than _____ ($__) each occurrence, _____ ($__) general aggregate, and _____ ($__) aggregate for products-completed operations hazard, providing coverage for claims including

- **.1** damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- **.2** personal injury and advertising injury;
- **.3** damages because of physical damage to, or destruction of, tangible property, including the loss of use of such property;
- **.4** bodily injury or property damage arising out of completed operations; and
- **.5** the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- **.1** Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- **.2** Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- **.3** Claims for bodily injury other than to employees of the insured.
- **.4** Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured
- **.5** Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- **.6** Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- **.7** Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- **.8** Claims related to roofing, if the Work involves roofing.
- **.9** Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- **.10** Claims related to earth subsidence or movement, where the work involves such hazards.
- **.11** Claims related to explosion, collapse, and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than _____ ($__) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than _____ ($__) each accident, _____ ($__) each employee, and _____ ($__) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than_____ ($__) per claim and_____ ($__) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than_____ ($__) per claim and_____ ($__) in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

☐ **§ A.3.3.2.1** Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below.

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

☐ **§ A.3.3.2.2 Railroad Protective Liability Insurance,** with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate, for Work within fifty (50) feet of railroad property.

☐ **§ A.3.3.2.3 Asbestos Abatement Liability Insurance,** with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

☐ **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

☐ **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

☐ **§ A.3.3.2.6 Other Insurance**

(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	**Limits**

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	
Performance Bond	

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

SECTION 01 1100

PROJECT SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Emergency Generator Replacement, T.G.C. Juvenile Justice Center, San Angelo, Texas

B. Owner's Name: Tom Green County

C. Architect's Name: KFW Architects AIA

D. Project Base Proposal shall consist of the new diesel emergency generator replacement for an existing TGC Juvenile Justice Center facility. Majority of the generator replacement is exterior work, but there is some site modified/demo. structural work, and modified MEP interior work will be part of the project.

By submitting a bid, each bidder agrees to waive any claims it has or may have against the Owner, the Engineer, the Architect, and their respective employees and offices, arising out of or in connection with the administration, evaluation, or recommendation of any bid; waiver of any requirements under the Bid Documents; or the Contract Documents; acceptance or rejection or any bids; and award of the Contract. By submitting a bid, each bidder agrees to exhaust its administrative remedies under Owner's (Tom Green County) Policy or the Dispute Clause of any resulting contract before seeking judicial relief of any type in connection with any matter related to this solicitation, the award of any contract, and any dispute under any resulting contract.

E. See the below (3) photos showing the existing landscaping screening and generator fencing enclosure screening along N. River Dr. traveling west. Note that the existing landscaping shall remain in place and the existing fence shall be replaced with a new 8'-0" high version to provide more adequate river corridor screening of the new generator. Also, the existing LP gas tank, foundation and posts shall be removed in its entirety with ground returning to planting fill. Note that the new generator is fueled by diesel with the tank being located within the base support structure of the generator.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price.

1.04 OWNER OCCUPANCY

A. Owner intends to occupy the Project throughout the generator replacement.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations. Note that the JJC will be fully operational during the project and that all necessary safety precautions to protect property shall be taken.

D. Schedule the Work to accommodate Owner's occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and premises to allow:

1. Work by Others.

2. Work by Owner.

C. Provide access to and from site as required by law and by Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.

2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Utility Outages and Shutdown:

1. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED SECTIONS

A. Contract Documents issued by the Architect.

1.03 SCHEDULE OF VALUES

A. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.

B. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization.

D. Include in each line item, the amount of Allowances specified in this section.

E. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit to the Architect at monthly intervals.

B. Present required information in typewritten form.

C. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.

D. For each item, provide a column for listing each of the following:

1. Item Number.
2. Description of work.
3. Scheduled Values.
4. Previous Applications.
5. Work in Place and Stored Materials under this Application.
6. Authorized Change Orders.
7. Total Completed and Stored to Date of Application.
8. Percentage of Completion.
9. Balance to Finish.
10. Retainage.

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

H. Submit three copies of each Application for Payment or email Pay Application with Items “I” below to Kye Franke, kye@kfwarchitects.com.

I. Include the following with the application:

1. Transmittal letter as specified for Submittals in Section 01 3000.
2. Construction progress schedule, revised and current as specified in Section 01 3000.
3. Partial release of liens from major Subcontractors and vendors.

J. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710, or other documents.

B. Construction Change Directive: Architect may issue a document, signed by Owner, instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

   1. Document will describe changes in the Work, and will designate method of determining any change in Contract Sum or Contract Time.

   2. Promptly execute the change in Work.

C. Proposal Request: Architect may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change. Contractor shall prepare and submit a fixed price quotation within 7 calendar days.

D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.

E. Computation of Change in Contract Amount:

   1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.

   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.

   3. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

F. Substantiation of Costs: Provide full information required for evaluation.

   1. On request, provide following data:

      a. Quantities of products, labor, and equipment.

      b. Taxes, insurance, and bonds.

      c. Overhead and profit.

      d. Justification for any change in Contract Time.

      e. Credit for deletions from Contract, similarly documented.

2. Support each claim for additional costs with additional information:

    a. Origin and date of claim.

    b. Dates and times work was performed, and by whom.

    c. Time records and wage rates paid.

    d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

G. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract on AIA G701.

H. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

I. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

J. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due. Submit to Architect.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01 7000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2200

ALLOWANCES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cash allowances.
   2. Contingency allowance.

B. Related Sections
   1. Section 01 2000 – Price and Payment Procedures.
   2. Section 01 3000 – Administrative Requirements.

C. Include in Contract Sum cash allowances scheduled at end of Section and contingency allowance specified in this Section.

D. Designate in Construction Progress Schedule specified in delivery dates for products under each allowance.

E. Designate in Schedule of Values specified in quantities of materials under unit cost allowances.

1.2 CASH ALLOWANCES

A. General:
   1. Purchase products under each allowance as directed by Architect.
   2. Amount of allowance includes:
      a. Net cost of product, less any applicable trade discounts.
      b. Delivery to site.
      c. Applicable taxes.
      d. Labor required under allowance, only when labor is specified to be included in allowance.
   3. In addition to amounts of allowances, include in Contract Sum, General Contractor's costs for:
      a. Handling at site, including unloading, uncrating, and storing.
      b. Protection from elements and from damage.
      c. Labor required for installation and finishing, except where installation is specified to be part of allowance.
      d. Other expenses required to complete installation.
   4. General Contractor's overhead and profit shall be included in the Contract Sum itself, including on any allowances as noted. At the conclusion of the Project, Construction Manager shall return any unused portion of allowances back to the Owner and the reduction of the General Contractor's overhead and profit should be reflected on the final payment for this reduction in construction cost.
   5. At closeout of Contract, funds remaining in Allowances will be credited to Owner by Change Order showing final construction cost.

B. Selection of Products:
   1. Architect's Duties:
      a. Consult with General Contractor in consideration of products and suppliers.
      b. Make selection; designate products to be used.
   2. General Contractor's Duties:
      a. Assist Architect in determining:
         1) Supplier or installer, as applicable. Cost, delivered and unloaded at site.
      b. Obtain proposals from suppliers when requested by Architect.

c. Notify Architect of any effect anticipated by selection of product or supplier under consideration on construction schedule or contract sum.
d. On notification of selection, enter into purchase agreement with designated supplier.

C. Delivery:
1. General Contractor's Duties:
a. Arrange for delivery and unloading.
b. Promptly inspect products for damage or defects.
c. Submit any claims for transportation damage.

D. Installation: Comply with requirements of referenced specification section.

E. Adjustment of Costs:
1. Should actual purchase cost be more or less than specified amount of allowance, Contract Sum will be adjusted by Change Order equal to amount of difference.
2. Amount of Change Order will recognize any changes in handling costs at site, labor, installation costs, overhead, profit, and other expenses caused by selection under allowance.
3. For products specified under unit cost allowance, unit cost shall apply to quantity listed in Schedule of Values.
4. Submit invoices or other data to substantiate quantity actually used.
5. Submit any claims for additional costs at site or other expenses caused by selection under allowances, prior to execution of work. Failure to do so will constitute waiver of claims for additional costs.

1.3 **CONTINGENCY ALLOWANCES:**
Include in Contract Sum a stipulated sum of **Three Thousand Dollars ($3,000) for General Contractor Contingency & Three Thousand Dollars ($3,000) for Owner Contingency** for use upon Owner's instruction.

1. General Contractor's costs for products, delivery, installation, equipment and labor will be included in "Field Request for Owner's Contingency" (FROC) forms authorizing expenditure of funds from this Contingency Allowance. Both Contingency Allowances shall be required to have signed authorization of the Owner, Architect and General Contractor.
2. Funds will be drawn from Contingency Allowance only by FROC, signed by Owner, Architect and General Contractor.
3. General Contractor's overhead and profit shall be included in the Contract Sum itself, including on the contingency and any allowances as noted. At the conclusion of the Project, General Contractor shall return any unused portion of the contingency or allowances back to the Owner and the reduction of the General Contractor's overhead and profit should be reflected on the final payment for this reduction in construction cost.
4. At Closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order showing final construction cost.

1.4 **GENERATOR CONCRETE SLAB REPLACEMENT:**
Six Thousand Dollars ($6,000). Contractor shall include in Contract Sum a stipulated sum of $6,000 in the event that either argumentation, addition to or full replacement of existing generator conc. slab is required for installation of new generator.

END OF SECTION

SECTION 01 2300

ALTERNATES

PART 1 GENERAL

1.1 SUMMARY:

A. Section Includes Documentation of changes to Contract Sum and Contract Time.

B. Contract Documents contain pertinent requirements for materials and methods to accomplish work described herein.

C. Provide alternate costs for inclusion in Contract Sum if accepted by Owner.

1.2 RELATED REQUIREMENTS:

A. Owner/General Contractor Agreement: Alternates accepted by Owner for incorporation into the Work.

B. Individual specification sections identified.

1.3 PROCEDURES:

A. All work (including any alternates) shall be part of Base Proposal cost. Any alternates will be exercised at the option of Owner and then deducted from the Base Proposal.

B. Coordinate related work and modify surrounding work as required to complete the work, including changes under each Alternate, when acceptance is designated in Owner/General Contractor Agreement.

1.4 DESCRIPTION OF ALTERNATES:

Deduct Alternate No. 1 - Contractor shall deduct from the Base Proposal all material & labor costs related to demolition of existing LP gas tank, its foundation & pipe columns.

END OF SECTION

SECTION 01 2500

SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Product Substitution Procedures.

1.2 GENERAL

A. Definition: Proposal by Contractor to use manufacturer, product, material, or system different from one required in Contract Documents.

B. Do not substitute Products unless a substitution request has been approved by Architect.

C. Substitutions during Bidding: Refer to Instructions to Bidders.

D. Architect will consider substitution requests within 30 days after award of Contract. After initial 30 day period, substitutions requests will be considered only due to non-availability of a specified Product through no fault of Contractor.

E. In case of non-availability of a specified Product notify Architect in writing as soon as non-availability becomes apparent.

1.3 SUBSTITUTION REQUESTS

A. Submit substitution requests on form provided in Project Manual

B. Document specified product and proposed substitution with complete data, including:
   1. Product identification, including name and address of manufacturer.
   2. Product description, performance and test data, and reference standards.
   3. Sample, if requested.
   4. Description of any anticipated effect that acceptance of proposed substitution will have on Progress Schedule, construction methods, or other items of Work.
   5. Description of any differences between specified product and proposed substitution.
   6. Difference in cost between specified product and proposed substitution.

C. Burden of proof for substantiating compliance of proposed substitution with Contract Document requirements remains with Contractor.

D. A request constitutes a representation that the Contractor:
   1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified Product.
   2. Will provide the same warranty for the substitution as for the specified Product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Will reimburse Owner for design services associated with re-approval by authorities or revisions to Contract Documents to accommodate the substitution.

E. Substitutions will not be considered if:
   1. They are indicated or implied on Shop Drawings or other submittals without submittal of a substitution request.

2. Approval will require substantial revision of Contract Documents without additional compensation to Architect.

F. Submit electronically in Adobe PDF format.

G. Architect will notify Contractor of approval or rejection of each Substitution Request.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 2900

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Schedule of Values.
   2. Applications for Payment.

B. Related Sections:
   1. Section 01 7700 - Closeout Procedures.

1.2 SCHEDULE OF VALUES

A. General:
   1. Submit a Schedule of Values to Architect at least 20 days prior to submitting first Application for Payment.
   2. Upon request of Architect, furnish additional data to support values given that will substantiate their correctness.
   3. Approved Schedule of Values will be used as basis for reviewing Contractor's Applications for Payment.

B. Form and Content:
   1. Format: AIA Document G703 - Continuation Sheet of Application and Certification for Payment
   2. Use Table of Contents of Project Manual as basis of format for listing costs of Work.
   3. List installed value of component parts of Work in sufficient detail to serve as basis for computing values for progress payments.
   4. Include separate line items for:
      a. Site mobilization.
      b. Bonds and insurance.
      c. Contractor's overhead and profit.
   5. For items on which payment will be requested for stored materials, break down value into:
      a. Cost of materials, delivered and unloaded, with taxes paid.
      b. Total installed value.
   6. For each line item that has a value of more than $25,000.00, break down costs to list major products or operations under each item.
   7. Total of costs listed in Schedule shall equal Contract Sum.

C. Submit electronic copy via Adobe PDF.

D. Review and Resubmittal:
   1. After initial review by Architect, revise and resubmit if required.
   2. Revise and resubmit along with next Application for Payment when a Change Order is issued. List each Change Order as a new line item.

1.3 APPLICATIONS FOR PAYMENT

A. Preparation:
   1. Format: AIA Document G702 - Application and Certification for Payment, supported by AIA Document G703 - Continuation Sheet.
   2. Prepare required information in typewritten format or on electronic media format.
   3. Use data from reviewed Schedule of Values. Provide dollar value in each column for each line item representing portion of work performed.

4. List each authorized Change Order as a separate line item, listing Change Order number and dollar value.
5. Prepare Application for Final Payment as specified in Section 01 7700.

B. Waivers of Lien:
1. Along with each Application for Payment, submit waivers of lien from Contractor and each Subcontractor or Sub-subcontractor included on the current month's Application for Payment.
2. Submit partial waivers on each item for amount requested, prior to deduction of retainage.
3. For completed items, submit full or final waiver.

C. Substantiating Data:
1. When Architect requires substantiating information, submit data justifying dollar amounts in question.
2. Provide one copy of data with cover letter showing Application number and date, and line item number and description.

D. Submittal:
1. Submit 5 copies of each Application for Payment.
2. Payment period: Submit at intervals stipulated in Owner/Contractor Agreement.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 3100

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Project coordination.
   2. Coordination drawings.
   3. Project meetings.

B. Related Sections:
   1. Section 01 7700 - Contract Closeout.

1.2 PROJECT COORDINATION

A. Coordinate scheduling, submittals, and work of various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

C. Coordinate space requirements and installation of mechanical and electrical items that are indicated diagrammatically on Drawings.
   1. Follow routing shown as closely as practical; place runs parallel with building lines.
   2. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean up of work of separate Sections in preparation for Substantial Completion.

F. Coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents to minimize disruption of Owner's activities.

1.3 COORDINATION

A. Hold coordination meetings with trades providing plumbing, fire protection, and electrical work.

B. Resolve conflicts between trades, prepare composite coordination drawings and obtain signatures on original composite coordination Drawings.

C. When conflicts cannot be resolved:
   1. Cease work in areas of conflict and request clarification prior to proceeding.
   2. Prepare drawings to define and to indicate proposed solution.
   3. Submit drawings for approval when actual measurements and analysis of Drawings and Project Manual indicate that various systems cannot be installed without significant deviation from intent of Contract Documents.

D. Submit original composite coordination drawings as part of Project Record Documents specified in Section 01 7700.

1.4 PROJECT MEETINGS

A. Schedule and administer preconstruction conference, progress meetings, and pre-installation conferences

B. Make physical arrangements for meetings; notify involved parties at least 4 days in advance.

C. Record significant proceedings and decisions at each meeting; reproduce and distribute copies to parties in attendance and others affected by proceedings and decisions made.

1.5 PRECONSTRUCTION CONFERENCE

A. Schedule within 15 days after date of Notice to Proceed at Contractor's central site convenient to all parties.

B. Attendance:
   1. Contractor.
   2. Owner.
   3. Architect and principal consultants.
   4. Major subcontractors and suppliers as Contractor deems appropriate.

C. Review and Discuss:
   1. Relation and coordination of various parties, and responsible personnel for each party.
   2. Use of premises, including office and storage areas, temporary controls, and security procedures.
   3. Construction schedule and critical work sequencing.
   4. Processing of:
      a. Contract modifications.
      b. Shop Drawings, Product Data, and Samples.
      c. Applications for Payment.
      d. Substitutions.
      e. Requests for Information.
      f. Other required submittals.
   5. Adequacy of distribution of Contract Documents.
   6. Procedures for maintaining contract closeout submittals.
   7. Installation and removal of temporary facilities.
   8. Notification procedures and extent of testing and inspection services.

1.6 PROGRESS MEETINGS

A. Schedule bi-monthly progress meetings.

B. Location: Contractor's Office.

C. Attendance:
   1. Contractor.
   2. Owner.
   3. Architect and consultants as appropriate to agenda.
   4. Subcontractors and suppliers as appropriate to agenda.
   5. Others as appropriate to agenda.

D. Review and Discuss:
   1. Work progress since previous meeting, including:
      a. Field observations, deficiencies, conflicts, and problems.

b. Progress and completion date.
c. Corrective measures needed to maintain quality standards, progress, and completion date.

2. Status of:
   a. Requests for information.
   b. Submittals.
   c. Contract modifications.
3. Coordination between various elements of Work.
4. Maintenance of Project Record Documents.

1.7 PRE-INSTALLATION CONFERENCES

A. Where required in individual specification Section, convene a pre-installation conference at project site or other designated location.

B. Require attendance of parties directly affecting or affected by work of the specific Section.

C. Review conditions of installation, preparation and installation procedures, and coordination with related work.

END OF SECTION

SECTION 01 3216

CONSTRUCTION PROGRESS SCHEDULES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Construction progress schedule.

B. Related Sections:
   1. Section 01 1100 - Summary of Work:
   2. Section 01 2900 - Payment Procedures.

1.2 FORMAT

A. Prepare Progress Schedule as a horizontal bar chart with separate bar for each major portion of Work or operation, identifying first work day of each week.

B. Sequence of Listings: Chronological order of the start of each item of Work.

C. Scale and Spacing: To provide space for notations and revisions.

D. Sheet Size: Multiples of 8-1/2 x 11 inches.

1.3 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification Section number.

C. Identify work of logically grouped activities.

D. Provide subschedules to define critical portions of the entire Progress Schedule.

E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

F. Provide separate schedule of submittal dates for Shop Drawings, Product Data, and Samples, including:
   1. Dates reviewed submittals will be required from Architect.
   2. Delivery dates for [Owner furnished products] [and] [Products identified under Allowance].

G. Coordinate content with Schedule of Values specified in Section 01 2900.

H. Revisions:
   1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
   2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

I. Provide narrative report to define problem areas, anticipated delays, and impact on Progress Schedule. Report corrective action taken, or proposed, and its effect.

1.4 SUBMITTAL

A. Submit initial Progress Schedule within 15 days after date of Notice to Proceed. After review, resubmit required revised data within 10 days.

B. Submit revised Progress Schedule with each Application for Payment.

C. Submit one copy.

1.5 DISTRIBUTION

A. Distribute copies of approved Progress Schedule to project site file, Subcontractors, suppliers, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Progress Schedule.

END OF SECTION

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Submittal procedures.
   2. Proposed Products list.
   3. Submittal schedule.
   4. Shop Drawings.
   5. Product Data.
   6. Samples.
   7. Quality control submittals.

B. Related Sections:
   1. Section 01 4000 - Quality Requirements.

1.2 SUBMITTAL PROCEDURES

A. Number each submittal with Project Manual section number and a sequential number within each section. Number resubmittals with original number and an alphabetic suffix.

B. Identify Project, Contractor, Subcontractor or supplier, pertinent Drawing sheet and detail numbers, and specification Section number, as appropriate.

C. Submit all submittals listed under “Submittals for Review” simultaneously for each Product or Specification Section.

D. Where multiple products functions as an assembly, group submittals for all related Products into single submittal.

E. Architect will not review incomplete submittals.

F. Apply Contractor’s stamp, signed or initialed certifying that:
   1. Submittal was reviewed.
   2. Products, field dimensions, and adjacent construction have been verified.
   3. Information has been coordinated with requirements of Work and Contract Documents.

G. Schedule submittals to expedite the Project, and deliver to Architect. Coordinate submittal of related items.

H. For each submittal, allow 14 days for Architect’s review, excluding delivery time to and from Contractor.

I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of completed Work.

J. Revise and resubmit submittals when required; identify all changes made since previous submittal.

K. Distribute copies of reviewed submittals to concerned parties and to Project Record Documents file. Instruct parties to promptly report any inability to comply with provisions.

1.3 PROPOSED PRODUCTS LIST

A. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

B. Submit electronically in Adobe PDF format.

1.4 SUBMITTAL SCHEDULE

A. Within 15 days after date of Notice to Proceed, submit a submittal schedule showing all submittals proposed for project, including submittals listed as:
   1. Submittals for Review.
   2. Quality Control Submittals.
   3. Closeout Submittals.

B. Include for each submittal:
   1. Specification section number.
   2. Description of submittal.
   3. Type of submittal.
   4. Anticipated submittal date.
   5. For submittals requiring Architect's review, date reviewed submittal will be required from Architect.

C. Submit electronically in Adobe PDF format.

1.5 SHOP DRAWINGS

A. Present information in clear and thorough manner.

B. Identify details by reference to sheet and detail numbers or room number shown on Drawings.

C. Reproductions of details contained in Contract Documents are not acceptable.

D. Submit electronically in Adobe PDF format.

1.6 PRODUCT DATA

A. Mark each copy to identify applicable products, models, options, and other data.

B. Supplement manufacturers' standard data to provide information unique to this Project.

C. Submit electronically in Adobe PDF format.

1.7 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

B. Where so indicated, submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect's selection.

C. Include identification on each sample, with full Project information.

D. Unless otherwise specified in individual specifications, submit two of each sample.

E. Architect will notify Contractor of approval or rejection of samples, or of selection of color, texture, or pattern if full range is submitted.

1.8 QUALITY CONTROL SUBMITTALS

A. Quality control submittals specified in Section 01 4000 are for information and do not require Architect's responsive action except to require resubmission of incomplete or incorrect information.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. References and standards.

B. Quality assurance submittals.

C. Mock-ups.

D. Control of installation.

E. Tolerances.

F. Testing and inspection services.

G. Manufacturers' field services.

1.02 RELATED SECTIONS

A. Document 00700 - General Conditions: Inspections and approvals required by public authorities.

B. Section 01 3000 - Administrative Requirements: Submittal procedures.

C. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCES

A. ASTM C 1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 1997.

B. ASTM E 329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction; 2000b.

C. ASTM E 543 - Standard Practice for Agencies Performing Nondestructive Testing; 1999.

D. ASTM E 548 - Standard Guide for General Criteria used for Evaluating Laboratory Competence; 1994.

1.04 SUBMITTALS

A. Testing Agency Qualifications:

1. Prior to start of Work, submit agency name, address, and telephone number, and names of full-time registered Engineer and responsible officer.

B. Design Data: Submit for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.

1. Include:

a. Date issued.

b. Project title and number.

c. Name of inspector.

d. Date and time of inspection.

e. Identification of product and specifications section.

f. Location in the Project.

g. Type of test/inspection.

h. Date of test/inspection.

i. Results of test/inspection.

j. Conformance with Contract Documents.

k. When requested by Architect, provide interpretation of results.

2. Test reports are submitted for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.

1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.05 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.

2. Perform specified testing of products in accordance with specified standards.

3. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.

4. Perform additional tests and inspections required by Architect.

5. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.

2. Agency may not approve or accept any portion of the Work.

3. Agency may not assume any duties of Contractor.

4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:

1. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.

2. Provide incidental labor and facilities:

a. To provide access to Work to be tested/inspected.

c. To facilitate tests/inspections.

3. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

3.05 MANUFACTURERS' 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 and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.

C. Report observations and site decisions or instructions given to installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 5000

TEMPORARY FACILITIES, CONTROLS AND SALVAGEABLE ITEMS

PART 1 GENERAL

Note: General Contractor will require a superintendent, dedicated to this project.

1.01 SECTION INCLUDES.

A. Temporary sanitary facilities.

B. Temporary Controls: Barriers, enclosures, and fencing.

C. Security requirements.

D. Vehicular access and parking.

E. Waste removal facilities and services.

F. Field offices

1.02 TEMPORARY UTILITIES

A. Existing utilities may be used.

1.03 TELEPHONE SERVICE

A. Provide and maintain a mobile phone with voice mail or an answering service. Mobile phone shall be accessible during normal business hours during mobilization and for the duration of the project.

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Use of existing facilities is not permitted.

C. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades required by governing authorities for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition. This can be chain link fencing – no PVC orange fencing.

1.08 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.09 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and TGC.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.10 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site as required by TGC.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.11 REMOVAL OF PROJECT RELATED UTILITIES, FACILITIES, CONTROLS AND SALVABLE ITEMS

A. Remove temporary utilities, equipment, facilities, materials, etc. prior to Substantial Completion inspection. Note that all salvageable items related to the project (including the old generator) shall become the property of the General Contractor & be removed from the site prior to Substantial Completion.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition.

END OF SECTION

SECTION 01 6000

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Procedures for Owner-supplied products.

G. Spare parts and maintenance materials.

1.02 RELATED SECTIONS

A. Section 01 4000 - Quality Requirements: Product quality monitoring.

1.03 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

1. Submit within 15 days after date of Agreement.

2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Do not use products having any of the following characteristics:

1. Made using or containing ACM’s, CFC's or HCFC's.

C. Provide interchangeable components from the same manufacturer for components being replaced.

D. Motors: Refer to Division 16 sections, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.

E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.

F. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Architect will consider requests for substitutions only within 30 days after date of Agreement.

C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

E. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Will provide the same warranty for the substitution as for the specified product.
3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

G. Substitution Submittal Procedure:

1. Submit three copies of request for substitution for consideration using the substitution request forms included at the end of this section. Limit each request to one proposed

substitution.

2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:

1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
2. Arrange and pay for product delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:

1. Review Owner reviewed shop drawings, product data, and samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
3. Handle, store, install and finish products.
4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 7000

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition.

C. Pre-installation meetings.

D. Cutting and patching.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, except payment procedures.

1.02 RELATED SECTIONS

A. Section 01 1100 - Summary: Work sequence.

B. Section 01 3000 - Administrative Requirements: Submittals procedures.

C. Section 01 4000 - Quality Requirements: Testing and inspection procedures..

D. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

D. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.05 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of 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. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

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 any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a pre-installation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:

1. Review conditions of installation, preparation and installation procedures.
2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two

copies to Architect, Owner, participants, and those affected by decisions made.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Execute cutting and patching to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

C. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

E. Restore work with new products in accordance with requirements of Contract Documents.

F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do no burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if

possible.

3.08 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

C. Verify that wiring and support components for equipment are complete and tested.

D. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

E. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 DEMONSTRATION AND INSTRUCTION

A. Utilize 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.

3.10 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.11 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Use cleaning materials that are not hazardous.

C. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Notify Architect when work is considered ready for Substantial Completion.

C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.

E. Notify Architect when work is considered finally complete.

F. Complete items of work determined by Architect's final inspection.

END OF SECTION

SECTION 01 7800

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED SECTIONS

A. Conditions of the Contract: Performance bond and labor and material payment bonds, warranty, and correction of work.

B. Section 01 3000 - Administrative Requirements: Submittal procedures, shop drawings, product data, and samples.

C. Section 01 7000 - Execution Requirements: Contract closeout procedures.

D. Individual Product Sections: Specific requirements for operation and maintenance data.

E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.

2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.

3. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.

4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:

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 Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 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.

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.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.

G. All project record documents will be issued to architect upon completion of project.

3.02 OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.05 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

C. Binders: Commercial quality, 8-1/2" x 11" three D side ring binders with durable plastic covers; 2" maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

E. Text: Manufacturer's printed data, or typewritten data.

F. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

G. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

H. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify 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 special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

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 and bonds.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.

END OF SECTION

SECTION 02 4116

STRUCTURE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolition of designated fence structures.
   2. Disconnection and removal of utilities.
   3. Demolition of walks and slabs.
   4. Removal of materials from site.

1.2 SUBMITTALS

A. Submittals for Review:
   1. Demolition procedures and operational sequence.

B. Quality Control Submittals: Submit prior to beginning demolition:
   1. Permits authorizing building demolition.
   2. Certificates of severance of utility services.
   3. Permit for transportation and disposal of debris.

1.3 QUALITY ASSURANCE

A. Comply with applicable codes, ordinances, rules, and regulations, including those for demolition, transportation, and disposal of debris.

B. Arrange for, obtain permits and certificates for, and pay fees required for:
   1. Transportation and disposal of debris.
   2. Demolition.
   3. Utility severance or relocation, including capping lines.
   4. Use of sidewalks, or other public places.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 PREPARATION

A. Prior to beginning demolition, verify that:
   1. Structures are unoccupied and removed from service.
   2. Temporary controls and devices are in place and operational.
   3. Utilities are temporarily or permanently disconnected or relocated as required.
   4. Items salvaged for Owner are removed and stored in designated area.

3.2 DEMOLITION

A. Demolish structures in accordance with demolition procedures approved by Architect.

B. Do not use water to extent causing flooding, contaminated runoff, or icing.

C. Break concrete into sections less than 3 feet in any dimension.

D. Remove slabs and foundations to full depth.

E. Remove any encountered below grade wood and metal.

F. Remove walks and slabs.

G. Uniformly grade areas to smooth surface. Adjust contours to eliminate water ponding and provide positive drainage. Make grade changes gradually. Blend slopes into level areas.

3.3 MATERIAL DISPOSAL

A. Salvage: Remove, protect, and relocate materials designated to remain property of Owner.

B. Disposal:
   1. Owner unwanted materials, equipment, and debris resulting from demolition operations becomes property of the General Contractor. Remove debris as soon as practical.
   2. Cover debris in trucks to prevent spillage during transportation.
   3. Do not store or burn materials on site.
   4. Transport debris to off site disposal area and legally dispose of.

END OF SECTION

SECTION 03 1000

CONCRETE FORMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Forms for cast-in-place concrete, with shoring, bracing, and anchorage.
   2. Form accessories.
   3. Stripping of forms.

B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. American Concrete Institute (ACI):
   1. 301 - Specifications for Structural Concrete for Buildings.
   2. 347 - Recommended Practice for Concrete Formwork.

B. American Society of Mechanical Engineers (ASME) A17.1 - Safety Code for Elevators and Escalators.

C. Engineered Wood Association (APA) PRP-108 - Performance Standards and Qualification Policy for Structural-Use Panels.

1.3 SUBMITTALS

A. Submittals for Review:
   1. Shop Drawings: Diagram of proposed construction joints not indicated on Drawings.

1.4 QUALITY ASSURANCE

A. Design formwork in accordance with ACI 301 and 347 [under supervision of Professional Structural Engineer licensed in State in which project is located].

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers - Architectural Form Liners:
   1. Dayton Superior. (www.daytonsuperior.com)
   2. Fitzgerqald Formliners.
   3. Greenstreak, Inc.

B. Acceptable Manufacturers - Form Accessories:
   1. Dayton Superior. (www.daytonsuperior.com)
   2. Greenstreak, Inc.
   3. Meadow Burke. (www.meadowburke.com)
   4. Nox-Crete Products Group.

C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Forms:
   1. Wood:
      a. Concealed surfaces:
         1) Lumber, No. 2 Common or better, dressed to smooth contact surfaces, or:
         2) APA Rated Plyform Class I or ll with HDO faces.
      b. Exposed surfaces: Non absorptive medium density overlay plywood.
   2. Metal: Minimum 16 gage steel, tight fitting, stiffened to support concrete.

B. Tubular Forms:
   1. Round, spirally wound laminated fiberboard, surface treated with release agent, non reusable.

2.3 ACCESSORIES

A. Form Release Agent: Nonstaining, colorless mineral oil that will not absorb moisture, stain concrete, or impair adhesion of coatings to be applied to concrete.

B. Construction Joints Forms: Formed galvanized steel, minimum 18 gage, with keyway.

C. Anchors and Fasteners: Size as required, sufficient strength to maintain forms in place while concrete is placed.

PART 3 EXECUTION

3.1 CONSTRUCTION

A. Construct formwork, shoring, and bracing to produce concrete of required shape, line, and dimension.

B. Arrange and assemble formwork with minimum joints, located to allow dismantling without damage to concrete.

C. Make joints watertight.

D. Provide chamfer strips in corners of forms to produce beveled external corners.

E. Camber formwork to compensate for deflection during concrete placement.

F. Adjust supports to take up settlement caused by concrete placement.

G. Provide temporary openings in formwork to allow cleaning and observation; locate at bottom of forms. Close with tight fitting panels flush with face of forms.

H. Construct forms for beams and girders so that sides may be removed without disturbing bottom of form or its support.

I. Clean contact and screed surfaces prior to concrete placement.

J. Construction Joints:
   1. Unless otherwise indicated on drawings, each unit of construction is a single unit; place concrete continuously to provide monolithic construction.
   2. Obtain Architect's approval of construction joint locations not indicated on Drawings.
   3. Provide keys and dowels in joints.
   4. Use construction joint form for joints in floor slabs. Set screed edge at required elevation. Secure to prevent movement.

K. Form Release Agent:
   1. Apply form release agent to formwork prior to placing reinforcing, anchoring devices, and embedded items; follow manufacturer's instructions.
   2. Do not allow agent to puddle in forms or to contact hardened concrete against which fresh concrete is to be placed.

L. Inserts and Embedded Parts:
   1. Before concrete is placed, install inserts, anchor slots, anchor bolts, and embedded parts required for attachment of work.
   2. Provide formed openings where required for pipes, conduits, sleeves, and other work passing through concrete members.
   3. Maintain in position during concrete placement.

M. Form Removal:
   1. Do not remove formwork until concrete has attained sufficient strength to resist dead loads plus applied live loads.
   2. Remove formwork in manner that will not damage surfaces of concrete; patch work damaged during form removal operations.
   3. Provide shoring, reshoring, and bracing as required.

N. Installation Tolerances:
   1. Construct formwork to maintain tolerances required by ACI 301.

END OF SECTION

SECTION 03 2000

CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Reinforcing bars, wire fabric, and accessories for cast-in-place concrete.

B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. American Concrete Institute (ACI) 301 - Specifications for Structural Concrete for Buildings.

B. ASTM International (ASTM):
   1. A185/A185M - Standard Specification for Welded Steel Wire Reinforcement, Plain, for Concrete.
   2. A615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   3. A767 - Standard Specification for Zinc-Coated (Galvanized) Bars for Concrete Reinforcement.
   4. D3963 - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Reinforcing Steel.

C. American Welding Society (AWS) D1.4 - Structural Welding Code - Reinforcing Steel.

D. Concrete Reinforcing Steel Institute (CRSI):
   1. Manual of Practice.
   2. Publication 63 - Recommended Practice for Placing Reinforcing Bars.
   3. Publication 65 - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

1.3 SUBMITTALS

A. Submittals for Review:
   1. Shop Drawings:
      a. Include bar sizes, spacings, laps, locations, and quantities of reinforcing bars, wire fabric, and accessories.
      b. Provide bending and cutting schedules.
      c. Show complete layout plan for each layer of reinforcing.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcing to project site in bundles marked with tags indicating bar size, length, and mark.

B. Store reinforcing above ground in dry, well drained area; protect from corrosion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Reinforcing Bars:

1. ASTM A615/A615M, deformed billet steel as indicated on Drawings.

B. Welded Wire Fabric:
1. ASTM A185/A185M. Furnish in flat sheets.

2.2 ACCESSORIES

A. Spacers, Chairs, Bolsters, and Bar Supports:
1. Sized and shaped for strength and support of reinforcement during concrete placement.
2. Galvanized or plastic coated steel for surfaces exposed to weather.

B. Tie Wire: Annealed steel, minimum 16 gage.

2.3 FABRICATION

A. Fabricate in accordance with ACI 301 and CRSI Manual.

B. Bend bars cold; do not heat or bend by makeshift methods. Discard damaged bars.

C. Welding: AWS D1.4.

D. Fabrication Tolerances:
1. Sheared length: Plus or minus 1 inch.
2. Bends in stirrups and ties: Plus or minus 1/2 inch.
3. All other bends: Plus or minus 1 inch.

PART 3 EXECUTION

3.1 PREPARATION

A. Before placing in work, thoroughly clean reinforcing of loose rust, mill scale, dirt, oil, and other materials that could reduce bonding.

B. Inspect reinforcing left protruding for future bonding or following delay in work, and clean if necessary.

3.2 INSTALLATION

A. Install reinforcing in accordance with ACI 301, and CRSI Manual and Publications 63 and 65.

B. Accurately position reinforcing; securely tie at intersections.

C. Welding: AWS D1.4.

D. Install wire fabric reinforcing in longest practical lengths. Offset end laps in adjacent widths to prevent continuous lap.

E. Do not displace or damage vapor retarder.

F. Locate splices not indicated on Drawings at points of minimum stress.

G. Clean and reprotect [galvanized] [epoxy coated] surfaces cut or damaged during installation.

END OF SECTION

SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cast-in-place concrete for slabs on grade.

B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. American Concrete Institute (ACI):
   1. 301 - Structural Concrete for Buildings.
   2. 305R - Hot Weather Concreting.
   3. 306R - Cold Weather Concreting.
   4. 308 - Standard Practice for Curing Concrete.
   5. 318 - Building Code Requirements for Structural Concrete.

B. ASTM International (ASTM):
   1. C31 - Standard Test Method for Method of Making and Curing Concrete Test Specimens in the Field.
   2. C33 - Standard Specification for Concrete Aggregates.
   3. C39 - Standard Test Method for Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   4. C94 - Standard Specification for Ready-Mixed Concrete.
   5. C143 - Standard Test Method for Slump of Portland Cement Concrete.
   6. C150 - Standard Specification for Portland Cement.
   7. C171 - Standard Specification for Sheet Materials for Curing Concrete.
   8. C172 - Standard Test Method for Method of Sampling Freshly Mixed Concrete.
   9. C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   10. C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
   11. C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
   12. C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
   13. C494 - Standard Specification for Chemical Admixtures for Concrete.
   14. C618 - Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.
   15. C1116/1116M - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
   16. D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.3 SUBMITTALS

A. Submittals for Review:
   1. Concrete Mix Designs: Include:
      a. Proportions of cement, fine and coarse aggregates, [fibrous reinforcing where scheduled,] and water.
      b. Combined aggregate gradation.
      c. Aggregate specific gravities and gradations.
      d. Water/cement ratio, design strength, slump, and air content.
      e. Type of cement and aggregates.

f. Air dry density and split cylinder ratio for lightweight concrete.
g. Type and proportion of admixtures.
h. Special requirements for pumping.
i. Range of ambient temperature and humidity for which design is valid.
j. Special characteristics of mix requiring precautions in mixing, placing, or finishing techniques to achieve finished product.

1.4 QUALITY ASSURANCE

A. Concrete Mix Design: In accordance with ACI 301, Method 1 or 2.

1.5 DELIVERY, STORAGE AND HANDLING

A. Mix and deliver concrete to project ready mixed in accordance with ASTM C94.

B. Schedule delivery so that pours will not be interrupted for over 15 minutes.

C. Place concrete on site within 90 minutes after proportioning materials at batch plant.

1.6 PROJECT CONDITIONS

A. Cold Weather Placement - Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures. Comply with ACI 306R and following requirements:
1. Air temperature at or expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

B. Hot Weather Placement - Place concrete in accordance with ACI 305R and following requirements:
1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Use chilled mixing water or chopped ice if water equivalent of ice is calculated in total amount of mixing water.
2. If required, cover reinforcing steel with water soaked burlap, so that steel temperature will not exceed ambient air temperature.
3. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers - Concrete Chemicals:
1. BASF Corporation. (www.buildingsystems.basf.com)
2. Dayton Superior. (www.daytonsuperior.com)
3. W. R. Meadows, Inc. (www.wrmeadows.com)
4. Meadow Burke. (www.meadowburke.com)
5. Nox-Crete Products Group. (www.nox-crete.com)

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Portland Cement: ASTM C150, Type I or III, gray color.

B. Aggregates:
   1. Fine: ASTM C33, clean, hard, durable, uncoated natural sand, free from silt, loam, and clay.
   2. Coarse: ASTM C33, clean, hard, durable, uncoated crushed stone, maximum size No. 467, Table No. 2.
   3. Lightweight: ASTM C330, expanded shale or clay produced by rotary kiln method.

C. Fibrous Reinforcing: ASTM C1116/1116M, 100 percent virgin polypropylene free from reprocessed olefin materials and specifically manufactured for use as concrete secondary reinforcement.

2.3 ACCESSORIES

A. Water: Clean and potable.

B. Admixtures:
   1. Water reducing or water reducing/set retarding: ASTM C494, Type A or D.
   2. Air entraining: ASTM C260.

C. Expansion Joint Filler: ASTM D1752, non asphaltic type.

D. Non Shrink Grout: Premixed, consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

E. Bonding Agent: Two component modified epoxy resin.

F. Curing Compound: ASTM C309, water based type.

G. Curing Paper: ASTM C171, waterproof paper or polyethylene film.

2.4 MIXES

A. Proportions: In accordance with ACI 301.

B. Design concrete to yield characteristics indicated on Drawings.

C. Use accelerating admixture in cold weather only when approved by Architect. Use of admixtures will not reduce cold weather placement requirements.

PART 3 EXECUTION

3.1 PREPARATION

A. Notify Architect and Testing Laboratory minimum 24 hours prior to placing concrete.

B. Accurately position anchor bolts, sleeves, conduit, inserts, and accessories. Do not cut reinforcing steel to facilitate installation of inserts or accessories.

C. Remove water and debris from forms and excavations.

D. Close openings left in forms for cleaning and inspection.

E. Prepare previously placed [and existing] concrete surfaces by cleaning with steel wire brush and applying bonding agent in accordance with manufacturer's instructions.

F. Where new concrete is doweled to existing, drill holes in existing concrete, insert steel dowels, and pack holes solid with non shrink grout.

3.2 PLACEMENT OF CONCRETE

A. Place concrete in accordance with ACI 301 and ACI 318.

B. Ensure reinforcement, inserts, and embedded parts are not disturbed during concrete placement.

C. Deposit concrete as nearly as possible in its final position to minimize handling and flowing.

D. Place concrete continuously between predetermined expansion, control, and construction joints.

E. Do not place partially hardened, contaminated, or retempered concrete.

F. Do not allow concrete to free fall over 8 feet; provide tremies, chutes, or other means of conveyance.

G. Consolidate concrete with mechanical vibrating equipment. Hand compact in corners and angles of forms.

H. Screed slabs level, to flatness tolerance of 1/8 inch in 10 feet.

3.3 PLACEMENT OF SEPARATE FLOOR TOPPINGS

A. Prior to placing toppings, remove deleterious material from concrete substrates; broom surfaces clean.

B. Apply bonding agent to concrete substrate; follow manufacturer's instructions.

**** OR ****

C. Apply sand and cement slurry coat to concrete surfaces just prior to placing topping.

D. Place divider strips and reinforcing.

E. Place toppings to required lines and elevations; screed level, to tolerance of 1/8 inch in 10 feet.

3.4 PLACEMENT OF GROUT

A. Remove loose and foreign matter from concrete; lightly roughen bonding surface.

B. Just prior to grouting, thoroughly wet concrete surfaces; remove excess water.

C. Mix grout in accordance with manufacturer's instructions. Do not retemper.

D. Place grout continuously, by most practical means; avoid entrapped air. Do not vibrate grout.

3.5 PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Provide artificial heat to maintain temperature of concrete above minimum specified temperature for duration of curing period.

D. Keep forms sufficiently wet to prevent cracking of concrete or loosening of form joints.

3.6 CURING

A. Cure concrete in accordance with ACI 308:
   1. Horizontal surfaces:
      a. Surfaces to receive additional toppings or setting beds: Use curing paper method.
      b. Other surfaces: Use either curing paper or curing compound method.
   2. Vertical surfaces: Use either wet curing or curing compound method.

B. Curing Compound Method:
   1. Spray compound on surfaces in two coats, applying second at right angle to first, at minimum rate recommended by manufacturer.
   2. Restrict traffic on surfaces during curing.

C. Curing Paper Method:
   1. Spread curing paper over surfaces, lapping ends and sides minimum 4 inches; maintain in place by use of weights.
   2. Remove paper after curing.

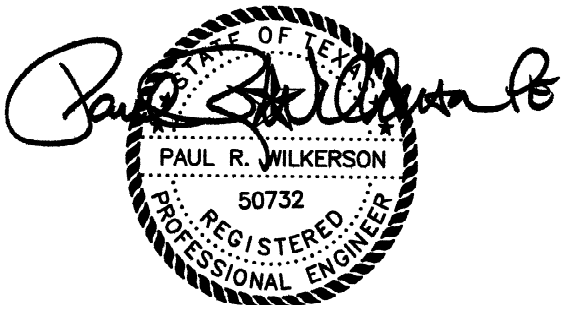
D. Wet Curing Method: Spray water over surfaces and maintain wet for 7 days.

3.7 CLEANING

A. Remove efflorescence, stains, oil, grease, and foreign materials from exposed surfaces.

END OF SECTION

PLUMBING, MECHANICAL & ELECTRICAL
SPECIFICATIONS



March 9, 2022

Paul Wilkerson, PE Texas # 50732
Power Systems
Firm #F-6257

SECTION 26 00 00 GENERAL PROVISIONS FOR ELECTRICAL

1 PART 1 GENERAL

1.1 SPECIAL NOTE

A. The Architectural and Structural Plans and Specifications, including the supplements issued thereto, Information to Bidders, and other pertinent documents issued by the Owner, are a part of these specifications and the accompanying mechanical and electrical plans, and shall be complied with in every respect. All the above is included herewith, will be issued separately or is on file at the Owner's office, and shall be examined by all bidders. Failure to comply shall not relieve the Contractor of responsibility or be used as a basis for additional compensation due to omission of drawings. Where the Supplementary General Conditions conflict with the General Conditions, the Supplementary General Conditions shall govern.

B. All work covered by this division of the specifications shall be accomplished in accordance with all applicable provisions of the contract documents and any addenda or directive which may be issued.

1.2 CHECKING DOCUMENTS

A. The drawings and the specifications are numbered consecutively. The Contractor shall check the drawings and specifications thoroughly and shall notify the Owner of any discrepancies or omissions of sheets or pages. Upon notification, the Owner will promptly provide the Contractor with any missing portions of the drawings or specifications. No discrepancies or omissions of sheets or pages of the contract documents will relieve the Contractor of his duty to provide all work required by the complete contract documents.

1.3 QUALITY ASSURANCE:

A. All plumbing work shall be in accordance with the requirements of the International Plumbing Code, 2015 Edition.

B. All mechanical work shall be in accordance with the requirements of the International Mechanical Code, 2015 Edition.

C. All electrical work shall be in accordance with the requirements of the National Electrical Code, 2014 Edition. All work shall comply with the 20155 International Energy Conservation Code.

D. Buy American Act: Only domestic construction materials will be used by the Contractor, Subcontractors, materialmen, and suppliers in the performance of this contract.

E. Products Criteria:

1. Standard Products: Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products for at least 3 years. See other specification sections for any exceptions.

2. Equipment Service: Products shall be supported by a service organization which maintains an adequate inventory of repair parts and is located within a one hundred mile radius of the site.

3. Multiple Units: When two or more units of materials or equipment of the same type or class are required, these units shall be products of one manufacturer.

4. Assembled Units: Manufacturers of equipment assemblies, which use components made by others, assume, complete responsibility for the final assembled product.

5. Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.

F. Manufacturer's Recommendations: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Architect prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.4 LAWS, CODES AND ORDINANCES

A. All work shall be executed in strict accordance with all local, state and national codes, ordinances and regulations governing the particular class of work involved, as interpreted by the inspecting authority. The Contractor shall be responsible for the final execution of the work under this heading to suit those requirements. Where these specifications and the accompanying drawings conflict with these requirements, the Contractor shall report the matter to the Owner, shall prepare any supplemental drawings required illustrating how the work may be installed so as to comply and, on approval, make the changes at no cost to the Owner. On completion of the various portions of the work the installation shall be tested by the constituted authorities, approved and, on completion of the work, the Contractor shall obtain and deliver to the Owner a final certificate of acceptance.

1.5 TERMINOLOGY

A. Whenever the words "furnish", "provide", "furnish and install," "provide and install", and/or similar phrases occur, it is the intent that the

materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.

B. Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.

C. The use of the word "shall" conveys a mandatory condition to the contract.

D. "This section" always refers to the section in which the statement occurs.

E. "The project" includes all work in progress during the construction period.

F. "Concealed" areas are those areas which cannot be seen by the building occupants from the floor with all building components in place.

G. "Exposed" areas are all areas which are exposed to view by the building occupants including mechanical rooms.

H. In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.6 ENGINEER'S STATUS DURING CONSTRUCTION:

A. The work, from its commencement to its completion, shall be under the exclusive charge and control of the Contractor, and all risks in connection therewith shall be borne by the Contractor.

B. The Engineer's efforts during periodic site visits will be directed toward assisting the Architect in providing assurance for the Owner that the completed project will conform to the requirements of the contract documents, but the Engineers will not be responsible for the Contractor's failure to perform the work in accordance with contract documents.

C. The Engineer will make recommendations to the Architect regarding disapproval or rejection of work which, in his opinion, is defective, i.e.; is unsatisfactory, faulty or defective, or does not conform to the requirements of the contract documents. Failure on the part of the Engineer to recommend disapproval of or rejection of work, methods, or acts or omissions of any kind shall never at any time be deemed to constitute acceptance or approval of the same.

1.7 GENERAL

A. In general, the lines and ducts to be installed by the various trades under these specifications shall be run as indicated, as specified herein, as required by particular conditions at the site, and as required to conform

to the generally accepted standards as to complete the work in a neat and satisfactorily workable manner. The following is a general outline concerning the running of various lines and ducts and is to be excepted where the drawings or conditions at the building necessitate deviating from these standards.

B. All piping, conduit and ductwork for the mechanical and electrical trades shall be concealed in chases in finished areas, except as indicated on the drawings. Horizontal lines run in areas that have ceilings shall be run concealed in those ceilings, unless otherwise specifically indicated or directed.

C. Piping, ductwork, conduits and raceways may be run exposed in machinery and equipment spaces, where serving as connections to motors and equipment items in finished rooms where exposed connections are required, and elsewhere as indicated on the drawings or required.

D. All conduits in any space where they are exposed shall run parallel with the building walls. They shall enter the concealed areas perpendicular with the walls, ceilings or floors. Fittings shall be used where necessary to comply with this requirement.

E. The Contractor shall thoroughly acquaint himself with the details of the construction and finishes before submitting his bid as no allowances will be made because of the Contractor's unfamiliarity with these details. Place all inserts in masonry walls while they are under construction. All concealed lines shall be installed as required by the pace of the general construction to precede that general construction.

F. The mechanical and electrical plans do not give exact details as to elevations of lines and ducts, exact location, etc., and do not show all the offsets, control lines, pilot lines and other installation details. The Contractor shall carefully lay out his work at the site to conform to the architectural and structural conditions, to provide proper grading of lines, to avoid all obstruction, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and thereby to provide an integrated, satisfactorily operating installation. Each Contractor shall verify that each item of mechanical equipment, each electrical panel, light fixture, and device, each grille or ceiling outlet, and each other item of work furnished by him shall fit into the available space before ordering same. Any required changes due to the Contractor's failure to verify that each item of his equipment will fit into the available space shall be made by the Contractor furnishing the equipment, all at no additional cost to the Owner.

G. The routing of piping, ductwork, conduits, etc., indicated on the drawings is approximate and where light fixtures or other items of work are to be recessed in ceiling, piping, ductwork, conduits, etc., shall be routed around the light fixtures or other items of work where there is not sufficient space for same to be routed above such item of work with the

recessed item properly installed. Any required changes due to the Contractor's failure to properly coordinate his work with recessed items shall be made by the Contractor installing such piping, ductwork, conduits, etc., all at no additional cost to the Owner.

H. The electrical plans show diagrammatically the locations of the various electrical outlets and apparatus and the method of circuiting and controlling them. Exact locations of these outlets and apparatus shall be determined by reference to the general plans and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the building, and in cooperation with other sections, and in all cases shall be subject to the approval of the Owner. The Owner reserves the right to make any reasonable change in location of any outlet or apparatus before installation (within 10 feet of location shown on drawings) or after installation if an obvious conflict exists, without additional cost to the Owner.

I. The Contractor shall submit working scale drawings of all his apparatus and equipment which in any way varies from these specifications and plans, which shall be checked by the Owner before the work is started, and interferences with the structural conditions shall be corrected by the Contractor before the work proceeds.

J. Order of precedence shall be observed in laying out the pipe, ductwork, material, and conduit in order to fit the material into the space above the ceiling and in the chases and walls. The following order shall govern:

1. Items affecting the visual appearance of the inside of the building such as lighting fixtures, diffusers, grilles, outlets, panelboards, etc. Coordinate all items to avoid conflicts at the site.

2. Large ducts and pipes with critical clearances.

3. Conduit, water lines, and other lines whose routing is not critical and whose function would not be impaired by bends and offsets.

K. Piping, ducts, and conduits serving outlets on items of equipment shall be run in the most appropriate manner. Where the equipment has built-in chases, the lines shall be contained therein. Where the equipment is of the open type, the lines shall be run as close as possible to the underside of the top and in a neat and inconspicuous manner. All piping, ductwork, conduits and all other items of work supported from the structure above shall be installed as high as physically possible (not just as convenient) considering all work required to be installed in the available space. If any such work is installed lower than it could have been installed, the Contractor shall furnish all labor, equipment, and materials to remove same and reinstall the work as high as possible, all at no additional cost to the Owner.

L. Adequate provisions shall be provided for the replacement of all filters.

M. In addition to insulation called for elsewhere in the specifications, all piping and equipment subject to condensation and/or whose normal operating surface temperature is below 70 degrees F or above 110 degrees F shall be insulated. All piping subject to condensation and/or whose operating temperature is below 70 degrees F shall be insulated same as specified elsewhere in the specifications for chilled water or refrigerant suction line piping. All piping with operating surface temperature above 110 degrees F shall be insulated same as specified elsewhere in the specifications for domestic hot water or steam piping. All insulation shall be provided by the particular Contractor who installs the particular equipment or piping system. All equipment shall be insulated and finished in a manner suitable for the conditions and as approved by the Engineers. Armaflex insulations shall not be permitted in breathing air spaces.

N. Exceptions and inconsistencies in plans and specifications shall be brought to the Owner's attention before the contract is signed. Otherwise, the Contractor shall be responsible for any and all changes and additions that may be necessary to accommodate his particular apparatus, material, or equipment.

O. The Contractor shall distinctly understand that the work described herein and shown on the accompanying drawings shall result in a finished and working job, and any item required to accomplish this intent shall be included whether specifically mentioned or not.

P. Each bidder shall examine the plans and specifications for the General Construction. If these documents show any item requiring work under Division 22, 23 or 26 and that work is not indicated on the respective "M", "P" or "E" drawings, he shall notify the Owner in sufficient time to clarify before bidding. If no notification is received, the Contractor is assumed to require no clarification, and shall install the work as indicated on the General Plans in accordance with the specifications.

1.8 DIMENSIONS

A. Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings. Any difference which may be found shall be submitted to the Owner for consideration before proceeding with the work.

1.9 INSPECTION OF SITE

A. The accompanying plans do not indicate completely the existing mechanical and electrical installations. The bidders for the work under these sections of the specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to met and the work to be accomplished in removing and codifying the existing work, and in

installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.

1.10 ELECTRICAL WIRING

A. All electric wiring of every character, both for power supply, for pilot and control, for temperature control, for communications, etc. will be done under Division 26 of these specifications. The Contractor for each section shall erect all his motors in place ready for connections. The Contractor, under Division 26, shall mount all the starters and controls, furnishing the supporting structures and any required outlet boxes.

B. Every electrical current consuming device furnished as a part of this project, or furnished by the Owner and installed in this project, shall be completely wired up under Division 26. Verification of exact location, method of connection, number and size of wires required, voltage requirements, and phase requirements is the responsibility of the Contractor under Division 26. If conflicts occur between the drawings and the actual requirements, actual requirements shall govern.

1.11 MOTORS AND CONTROLS

A. All motors furnished under any of the several sections of these specifications shall be of recognized manufacture, of adequate capacity for the loads involved and wound for the current characteristics shown on the electrical drawings. All motors shall conform to the standards of manufacture and performance of the National Electrical Manufacturer's Association as shown in their latest publications. They shall further be listed by Underwriters Laboratories.

B. Unless otherwise noted, the Contractor under Division 16 shall furnish each motor with a starter and all controls of the types specified or required. The starters shall be of the totally enclosed type, of capacity rating within the required limits of the motors which they are to serve, shall be suitable for the motor current characteristics and shall provide thermal overload protection. All starters shall be of standard manufacture and performance as defined by the National Electrical Manufacturers' Association. They further shall be listed by Underwriters Laboratories. Provide overload protection in each phase wire.

C. All motors larger than 1/3 horsepower shall be of a type that the power consumed is in approximate direct proportion to the load on the motor. At 50% of rated brake horsepower, the power consumed shall be approximately 50% of the power consumed at full load.

1.12 TESTING

A. The Contractor under each division shall at his own expense perform the various tests as specified and required by the Owner and as required by the State and local authorities. The Contractor shall furnish all fuel and materials necessary for making test.

1.13 PAINTING

A. Painting for Divisions 22, 23 and 26 shall be as follows:

1. If the factory finish on any apparatus or equipment is marred, it shall be touched up and then given one coat of half-flat-half-enamel, followed by a coat of machinery enamel of a color to match the original. Paint factory prime surfaces.

1.14 SEALING AROUND PIPES, CONDUITS, DUCTS, ETC.

A. The Contractor installing pipes, conduits, ducts, etc. shall seal all spaces between pipes and/or sleeves where they pierce walls, partitions or floors with Dow Corning No. 2000 fire resistant caulk. The packing shall effect a complete fire and/or air seal where pipes, conduits, ducts, etc., pierce walls, floors or partitions.

1.15 GENERAL

A. The contractor shall provide all labor, equipment, materials, etc. and shall perform all operations in connection with the installation of electrical work in accordance with these contract documents.

B. The contractor shall execute all work specified or indicated on accompanying drawings. Contractor shall provide all equipment necessary and usually furnished in connection with such work and systems, whether or not specifically mentioned.

C. Every contractor shall be responsible for all his work fitting into place in a satisfactory and neat workmanlike manner in every particular to the approval of the owner.

D. Confer with the general contractor and other contractors regarding the location and size of pipes, equipment, fixtures, conduit, ducts, openings, switches, outlets, etc., that there be no interferences between the installation or progress of the work of any contractor on the project.

E. The electrical drawings are diagrammatic and shall be followed as closely as actual construction of the building and the work of other trades will allow. All changes from drawings necessary to make the work of each contractor conform to the building construction and the work of other trades shall be done at the appropriate contractor's expense.

F. Should any bidder consider that any requirement of these specifications and drawings will make the effective operation of any portion or the whole installation impossible, or if he feels a vital component has been omitted, he must describe in his bid changes he deems necessary. Failure to do so shall be considered as an agreement on the part of the bidder to guarantee the effective operation of the installation.

G. All equipment shall be installed complete with all necessary fittings, supports, accessories, etc., as necessary for a complete installation, providing the desired function. All equipment shall be installed in accordance with manufacturer's recommended procedure unless specifically stated otherwise.

H. Nothing in these specifications or drawings shall be construed as directing any contractor from deviating from any legally binding code or ordinance.

1.16 SUBMITTALS

A. Sequence: The contractor is required to submit four copies of the following types of information:

1. Prior to ordering equipment: shop drawings/ component data.

2. At the end of the project before final inspection: maintenance manuals, warranties, certificate of owner's instruction and a certificate of receipt of loose items.

B. Maintenance manuals shall include shop drawings, wiring diagrams, operating instructions, lubrication instructions, maintenance instructions, parts lists, and test reports.

2 PART 2 PRODUCTS

A. PRODUCT LISTING

1. When two or more items of same material or equipment are required, they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, wire, conduit, fittings, sheet metal, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in work, except where indicated otherwise.
2. Provide products which are compatible within systems and other connected items.

B. NAMEPLATE DATA

1. Provide permanent operational data nameplate on each item of power operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, operating and power

characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

3 PART 3 EXECUTION

3.1 OPENINGS AND SLEEVES IN CONSTRUCTION

A. Most openings required in wall, floor, roof, ceiling, etc., construction for electrical work will be provided by the general contractor in accordance with information furnished by the electrical contractor. All sleeves, inserts, forms, etc., required for openings shall be furnished by the contractor requiring same. The electrical contractor shall be responsible for their size, fabrication and location. Where new work has been installed previous to this request, the general contractor will do the necessary cutting and patching at the expense of the electrical contractor.

3.2 PROTECTING SITE

A. Provide adequate barricades, signs, torches, etc. as required during progress of the work. Observe all applicable regulations respecting safety provisions.

B. Protect utilities, trees, shrubbery, fences, poles, sidewalks, curbs and all other property and surface structures from damage. Any items which are damaged shall be restored by the contractor at his own expense.

3.3 MECHANICAL-ELECTRICAL COORDINATION

A. Unless otherwise specified the electrical contractor will furnish and install all conduit, wiring, disconnects, starter, overloads, holding coils, remote pushbutton stations, control switches, and pilot lights for all electrically operated mechanical equipment, including final connections.

B. The mechanical contractor shall provide and connect wiring for all control devices such as thermostats, pressure sensors, humidistats, etc., associated with the mechanical equipment, and shall install those items which due to their method of operation must be connected or integrated into the equipment. Items not attached to mechanical equipment, conduit, duct or piping shall be installed by the electrical contractor. All wiring for mechanical control shall be provided and installed by the mechanical contractor. The mechanical contractor is responsible for coordinating his requirements with the electrical contractor. Control diagrams shall be provided by the mechanical contractor.

C. Each contractor shall consult with the electrical contractor before ordering or installing electrical equipment and shall be responsible to insure the equipment installed is of proper size and type.

D. After wiring is completed by the electrical contractor, each mechanical contractor shall inspect the appropriate wiring before motors are

operated. If any discrepancies are discovered, the mechanical contractor shall notify the owner in writing. The owner shall arrange to have changes made as required.

3.4 MOUNTING HEIGHTS TO COMPLY WITH ADA REGULATIONS

A. Install all electrical components regulated by ADA regulations at heights required in areas of the building which comply with ADA regulations. Coordinate the height of any component not listed below.

B. Electrical Components:
1. Light Switches: 48" max. (measured to top of box).
2. Receptacles and Telephone Jacks: 18" min. (measured from floor to center of box).
3. Thermostats: 48" max. (measured from floor to top of box).
4. Audio/Visual Warning Devices: 80" max. (measured from floor to center of device).

3.5 STRUCTURAL CONDITIONS

A. These specifications and the drawings accompanying same are intended to cover an installation which will not interfere with the structural design of the building, which will fit into the several available spaces, and which will insure a complete and satisfactory mechanical and electrical system.

B. Each bidder shall carefully examine the plans for all branches of the work and shall be responsible for the proper fitting of his material and apparatus into the building.

C. Should the particular equipment which any bidder proposes to install require other space conditions than those shown on the drawings, he shall arrange for such space with the Architect before submitting his bid. Should changes become necessary on account of failure to comply with this clause, the Contractor shall make such necessary changes at his (the Contractor's) own expense.

3.6 OWNER INSTRUCTIONS

A. Each contractor shall instruct the owner's representative in the operation and maintenance of each system. Instruction periods shall be at the convenience of the owner. Submit a letter signed by the owner certifying satisfactory completion of instructional activities.

3.7 FINAL INSPECTION

A. Final inspection will be made only after the contractor certifies in writing that the work is 100% complete.

B. A representative from each contractor and sub-contractor shall be present and be prepared to assist the owner in performing the inspection.

C. A report describing incomplete or unacceptable work will be reviewed with the contractor. The contractor shall then certify to the owner in writing that such unacceptable or incomplete work is 100% corrected.

3.8 PROJECT CLOSEOUT

A. Before final application for payment will be accepted, contractor must complete the following requirements:

1. Final inspection performed and all corrections made.

2. Submittal of maintenance manuals, certificate of owner instruction, equipment warranties and receipt for loose items.

3.9 COMMISSIONING

A. Contractor shall employ an independent testing agency to perform the commissioning required in Section C 408 of the 2015 IECC.

1. Compliance with the power allowance for lighting fixtures shall be documented.

2. Commissioning of the lighting controls installed on the project shall be performed. This includes occupancy sensors and controls, time switch controls and daylight responsive controls. All parts of the lighting control and switching system shall be documented to be fully operational in accordance with the plans and specifications.

END OF SECTION

SECTION 26 00 10 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

1 PART 1 - GENERAL

1.1 DESCRIPTION – Documents to be submitted for approval before construction

1.2 SUBMITTALS

A. Shop and Installation Drawings, Product Data and Samples as required.

B. Prepare and submit, with construction schedule, a separate schedule listing dates when shop drawings, product data and any requested samples will be needed for each product.

1.3 GENERAL

A. Requests for material substitutions must be received and approved prior to submission of shop drawings, said submittals and/or samples; reviewed by architect or engineer does not constitute acceptance of materials other than those originally specified.

1.4 SHOP DRAWINGS

A. Original drawings, which illustrate portion of the work: Showing equipment, layout, setting or installation details. Deviation from Contract Drawings shall be marked in RED with an explanation of reason for change

B. Prepared by a qualified detailer.

C. Identify details by reference to sheet and detail number shown on contract drawings.

D. Reference specification section and paragraph number(s) represented on the submitted drawings.

E. Minimum Sheet Size: 8½" x 11".

1.5 PRODUCT DATA

A. Manufacturer's standard schematic drawings:

1. Modify drawings to delete information which is not applicable to project.

2. Supplement standard information to provide additional information applicable to project.

B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.

1. Clearly mark each copy to identify pertinent materials, products or models.

2. Show dimensions and clearance required.

3. Shop performance characteristics and capacities.

4. Show wiring diagrams and controls.

C. Complete catalogs will not be acceptable. Manufacturer's regular catalog sheets will be acceptable if they completely indicate specification requirements. When manufacturer's catalog sheets are submitted, completely line out material not directly connected with subject.

1. Assemble in indexed brochure, catalog sheets of submittals containing more than five (5) different items or equipment.

D. Reference specification section and paragraph number represented on data submitted.

1.6 CONTRACTORIS RESPONSIBILITIES

A. Review shop drawings, product data and samples prior to submission and certify with signature of reviewer

B. Verify:

1. Field measurements.

2. Field construction criteria.

3. Catalog numbers and similar data.

4. Quantities

C. Coordinate each submittal with requirements of work and of contract documents.

D. Contractor's responsibility for errors, omissions and deviations in submittals from requirements of contractor documents is not relieved by architect's review of submittals, unless architect gives written acceptance of specific deviations.

1. Notify architect in writing of deviations at the time of submittal.

E. Begin no work which requires submittals until return of submittals with architect's stamp and initials or signature indicating review.

F. After architect's / engineer's review, distribute copies.

1.7 SUBMISSION REQUIREMENTS

A. Schedule submissions at least 15 days before dates reviewed submittals will be needed.

B. Submit a minimum of 5 copies of all submittals.

C. Accompany submittals with transmittal in duplicate, containing:

1. Date.

2. Project title and number.

3. Contractor's name and address.

4. The number of each shop drawings, product data and samples submitted.

5. Notification of deviations from contract documents.

6. Other pertinent data.

D. Submittals shall include:

1. Date and revision date.

2. Project title and number.

3. The names of:

a. Architect.

b. Contractor.

c. Subcontractor.

d. Supplier.

e. Manufacturer.

f. Separate detailer when pertinent.

4. Identification of product or material.

5. Relation to adjacent structure or materials.

6. Field dimensions, clearly identified as such.

7. Specification section number.

8. Applicable standards, such as ASTM or Federal Specifications numbers.

9. A blank space, 3" x 3" for the architect's stamp.

10. Identification of deviations from contract documents in red ink include justification for deviation.

11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with contract documents.

Failure to comply with the above requirements shall be grounds for rejection of submittal.

1.8 RESUBMISSION REQUIREMENTS

A. Shop Drawings:

1. Revise initial drawings as required and resubmit as specified for initial submittal.

2. Indicate on drawings any changes which have been made other than those requested by architect.

3. Product Data and Samples: Submit new data and samples as required for initial submittal.

1.9 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

A. Distribute copies of Shop Drawings and Product Data which carry architect's stamp to:

1. Contractor's file.

2. Job-site file.

3. Record document's file.

4. Other prime contractors.

5. Subcontractor.

6. Supplier.

7. Fabricator.

B. Distribute samples as directed.

1.10 ARCHITECT'S / ENGINEER"S RESPONSIBILITIES

A. Review submittals with reasonable promptness.

B. Review for:

1. Design concept of project.

2. Information given in contract documents.

3. Architect or Engineer is not responsible for verification of quantities.

C. Review of separate items does not constitute review of an assembly in which item functions.

D. Affix stamp and initials or signature certifying the review of submittals.

E. Return submittals to contractor for distribution.

END OF SECTION

SECTION 26 05 10 BUILDING WIRE AND CABLE

1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Building wire and cable.

B. Nonmetallic-sheathed cable.

C. Direct burial cable.

D. Service entrance cable.

E. Armored cable.

F. Metal clad cable.

G. Intercom/Speaker cable.

H. Telephone cable.

I. Computer cable

J. Television cable

K. Wiring connectors and connections.

1.2 RELATED SECTIONS

A. Section 26 05 53 - Electrical Identification.

B. Section 27 20 00 - Communications and Computer Systems.

1.3 REFERENCES

A. NECA Standard of Installation (National Electrical Contractors Association).

B. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. NFPA 70 - National Electrical Code, Governing Edition.

D. TIA/EIA Standards 568, 568-A, 569, 570, 606, 607

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years experience.

1.5 REGULATORY REQUIREMENTS

A. Conform to NFPA 70, Governing or Latest Edition as applicable.

B. Furnish products listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.6 PROJECT CONDITIONS

A. Verify that field measurements are as indicated.

B. Conductor sizes are based on copper. All power wiring shall be stranded.

C. Wire and cable routing indicated is approximate unless dimensioned.

1.7 COORDINATION

A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

2 PART 2 PRODUCTS

2.1 BUILDING WIRE

A. Description: Single conductor insulated stranded wire.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: NFPA 70, Type THHN/THWN.

2.2 NONMETALLIC-SHEATHED CABLE

A. Description: NFPA 70, Type NMC.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

2.3 DIRECT BURIAL CABLE

A. Description: NFPA 70, Type UF.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation Temperature Rating: 90 degrees C.

E. Use only if specifically permitted on drawing sheets.

F. Underground Warning Tape: 4-inch wide plastic tape, colored red with suitable warning legend describing buried electrical lines.

2.4 SERVICE ENTRANCE CABLE

A. Description: NFPA 70, Type SE or USE.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: Type RHH or XHHW or THHN.

2.5 ARMORED CABLE

A. Not allowed on this project.

2.6 METAL CLAD CABLE

A. Not allowed on this project.

2.7 INTERCOM/SPEAKER CABLE

A. Description: UL Listed Type CL2.

B. Conductor: Copper.

C. Insulation Voltage Rating: 300 volts.

D. Temperature Range: -20 deg C to 105 deg C.

E. Insulation Material: PVC, plenum rated.

F. Size: 22 gauge, single pair.

G. Aluminum Foil Shield.

H. Raceway: required.

2.8 TELEPHONE CABLE (N/A)

A. Description: Belden type 9566 or equal or CAT-3 or equal.

B. Conductor: Copper.

C. Insulation Voltage Rating: 300 volts.

D. Insulation material: PVC.

E. Size 24 gauge, 3 pair minimum.

F. Unshielded

G. Raceway: Required.

2.9 COMPUTER CABLE (SECTION 27 20 00 HAS PRECEDENCE)

A. Description: EIA/TIA 568 Belden type 1583A or equal, non-plenum rated. Provide CAT-6 or as noted on the drawings. Verify category of cable before bidding on the project.

B. Conductor: Copper.

C. Insulation Rating: 300 volts.

D. Insulation Material: PVC, blue, plenum rated.

E. Size: 24 gauge, 4 pair twisted.

F. The Contractor shall install all computer cabling and terminations.

G. Unshielded.

H. Raceway: Required.

I. Termination: At work area, terminate each 4 pair cable in an eight pin, modular jack. Connectors to be 100-ohm UTP outlets.

2.10 TELEVISION CABLE (SECTION 27 20 00 HAS PRECEDENCE)

A. Description: 75 ohm coaxial cable, Belden type 9104 or equal, RG-59.

B. Conductor: Copper.

C. Insulation: Gas Injected, plenum rated.

D. Jacket: PVC, black.

E. Size: 18 gauge

F. Shielded.

G. Raceway: required.

2.11 SECURITY SYSTEM CABLING (SECTION 27 20 00 HAS PRECEDENCE)

A. ALARM
1. Door Contact: 22 ga. / 2 pair Belden
2. Motion Detector: 22 ga. / 4 pair Belden
3. Glass Break Detector: 22 ga. / 4 pair Belden
4. Keypad: 22 ga. / 4 pair or 18 ga. / 4 pair for longer runs Belden. Must be Fire Wire if any fire is involved.
5. Zone Expander: 22 ga. / 4 pair Belden
6. Wireless Expander: 22 ga. / 4 pair Belden
7. Siren: 22 ga. / 2 pair Belden, must be Fire Wire if any fire is involved.
8. A/C Power: 22 ga. / 4 pair Belden, must be Fire Wire if any fire is involved.

B. ACCESS CONTROL
1. Mag Lock: 18 ga. / 2 pair
2. Door Strike: 18 ga. / 2 pair
3. Contact: 22 ga. / 2 pair
4. Reader: CAT-5e or 22 ga. / 6 pair
5. Request to Exit Button: 22 ga. / 4 pair
6. Request to Exit Motion: 22 ga. / 4 pair
7. Kantech KT-300 Link to other KT-300 panels: CAT-5e
8. Touch Crash Exit Bar: 22 ga. / 4 pair

C. CCTV
1. Camera – Analog: RG-59 Coax paired with 18 ga. / 2 pair Siamese wire
2. Camera – IP: CAT-6
3. Camera Power: 18 ga. / 2 pair
4. Other Monitors: RG-59 Coax or RG-6 Coax
5. Microphones: 18 ga. / 2 pair shielded with ground

D. STRUCTURED CABLE
1. Ethernet: CAT-6
2. Telephone: CAT-6
3. CATV: RG-6 Coax

E. Conductor: Copper.

F. Jacket: PVC, Color as determined by Owner.

3 PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

C. Verify that raceway installation is complete and supported.

3.2 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.3 WIRING METHODS

A. Concealed Dry Interior Locations: Use only building wire, THHN insulation, in raceway.

B. Exposed Dry Interior Locations: Use only building wire, Type THHN insulation, in raceway.

C. Wet or Damp Interior Locations: Use only building wire, Type THWN insulation, in raceway.

D. Exterior Locations: Use only building wire, Type THWN insulation, in raceway.

E. Underground Installations: Use only building wire, Type THWN insulation, in raceway.

F. Use wiring methods indicated.

3.4 INSTALLATION

A. Route wire and cable as required to meet Project Conditions.

B. Install cable in accordance with the NECA "Standard of Installation."

C. Use stranded conductor for all feeders and branch circuits.

D. Use stranded conductors for control circuits.

E. Use conductor not smaller than 12 AWG for power and lighting circuits.

F. Use conductor not smaller than 16 AWG for control circuits.

G. Increase wire size by one wire size for branch circuits that are longer than 75 feet.

H. Increase wire size by two wire sizes for branch circuits that are longer than 200 feet.

I. Pull all conductors into raceway at same time.

J. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

K. Protect exposed cable from damage.

L. Support cables above accessible ceiling, using spring metal clips. Do not rest cable on ceiling panels.

M. Use suitable cable fittings and connectors.

N. Neatly train and lace wiring inside boxes, equipment, and panelboards. Provide cable ties every 12 inches minimum to keep wiring neatly trained.

O. Clean conductor surfaces before installing lugs and connectors.

P. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

Q. Use wedget connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

R. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

S. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

T. Trench and backfill for direct burial cable installation. Install warning tape along entire length of direct burial cable, within 6 inches of grade.

U. Identify and color code wire and cable under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation.

V. Seal all penetrations of fire rated walls.

W. All Computer Cabling drops shall be 295 feet or less, color-coded according to TIA/EIA 568, Section 10.2.1.1.3 and shall have no bends tighter than 6 times the OD of cable.

X. TV terminations to be mounted in a standard cable face plate at height noted on the drawings. Provide 120- volt receptacle within 12 inches of face plate at same height.

3.5 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

C. Computer cable shall meet requirements of TIA/EIA 568-A. Any cables failing test shall be replaced at contractor's expense.

END OF SECTION

SECTION 26 05 26 GROUNDING AND BONDING

1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grounding electrodes and conductors.

B. Equipment grounding conductors.

C. Bonding.

1.2 REFERENCES

A. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).

B. NFPA 70 - National Electrical Code.

1.3 GROUNDING SYSTEM DESCRIPTION

A. Metal underground water pipe.

B. Metal frame of the building.

C. Rod electrodes.

1.4 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 10 ohms.

1.5 SUBMITTALS FOR CLOSEOUT

A. Project Record Documents: Record actual grounding system resistance of components and grounding electrodes.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

2 PART 2 PRODUCTS

2.1 ROD ELECTRODES

A. Material: Copper-clad steel.

B. Diameter: 3/4 inch.

C. Length: 10 feet.

2.2 EXOTHERMIC CONNECTIONS

A. Manufacturers:
1. Erico Cadweld.

2.3 WIRE

A. Material: Stranded copper.

B. Foundation Electrodes: 2/0 AWG.

C. Grounding Electrode Conductor: Size to meet NFPA 70 requirements.

3 PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rods.

3.2 INSTALLATION

A. Install rod electrodes at service entrance and dry type transformers 25 KVA or larger. Install additional rod electrodes to a maximum of three (3) to achieve specified resistance to ground. Bond all electrodes together with #2 copper grounding conductor connected to service entrance grounding electrode.

B. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing.

C. Provide bonding to meet Regulatory Requirements.

D. Bond together metal siding not attached to grounded structure; bond to ground.

E. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

F. Isolated Grounding Conductor: From designated panel grounding bar, run isolated ground conductor continuously back to service entrance grounding electrode. Bond with exothermic weld.

3.3 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.13.

END OF SECTION

SECTION 26 05 33 CONDUIT

1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal conduit.

B. Flexible metal conduit.

C. Liquidtight flexible metal conduit.

D. Electrical metallic tubing.

E. Nonmetal conduit.

F. Electrical nonmetallic tubing.

G. Flexible nonmetallic conduit.

H. Fittings and conduit bodies.

1.2 RELATED SECTIONS

A. Section 26 05 34 - Boxes.

B. Section 26 05 26 - Grounding and Bonding.

C. Section 26 05 29 - Supporting Devices.

D. Section 26 05 53 - Electrical Identification.

1.3 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

C. ANSI C80.5 - Rigid Aluminum Conduit.

D. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

E. ANSI/NFPA 70 - National Electrical Code.

F. NECA "Standard of Installation."

G. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.

H. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

I. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.4 DESIGN REQUIREMENTS

A. Conduit Size: ANSI/NFPA 70.

B. All cabling, both power rated and low voltage, shall be installed in conduit or cable tray.

1.5 PROJECT RECORD DOCUMENTS

A. Accurately record actual routing of conduits larger than 2 inches.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle Products to site.

B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

D. Protect PVC conduit from sunlight.

1.8 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

2 PART 2 PRODUCTS

2.1 CONDUIT REQUIREMENTS

A. Minimum Size: 3/4 inch unless otherwise specified.

B. Underground Installations:

1. More than Five Feet from Foundation Wall: Use thickwall nonmetallic conduit.
2. Within Five Feet from Foundation Wall: Use rigid steel conduit or intermediate metal conduit.
3. In or Under Slab on Grade: Use rigid steel conduit, intermediate metal conduit, Schedule 40 PVC conduit.
4. Minimum Size: 3/4 inch.

C. Outdoor Locations, Above Grade: Use rigid steel, or intermediate metal conduit.

D. In Slab Above Grade:

1. Use rigid steel conduit, intermediate metal conduit, or Schedule 40 PVC conduit. No PVC conduit to extend above concrete.
2. Maximum Size Conduit in Slab: 3/4 inch; 1/2 inch for conduits crossing each other.

E. Wet and Damp Locations: Use schedule 80 PVC conduit or PVC coated rigid conduit.

F. Dry Locations:

1. Concealed: Use rigid steel, intermediate metal conduit or electrical metallic tubing throughout project.
2. Exposed: Use rigid steel, intermediate metal conduit or electrical metallic tubing throughout project.

2.2 METAL CONDUIT

A. Rigid Steel Conduit: ANSI C80.1.

B. Rigid Aluminum Conduit: ANSI C80.5.

C. Intermediate Metal Conduit (IMC): Rigid steel.

D. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.

2.3 PVC COATED METAL CONDUIT

A. Manufacturers:
1. Robroy Plasti-Bond REDH$_2$OT PVC coated conduit.
2. Substitutions of approved equals permitted.

B. Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick. Use in highly corrosive areas.

C. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.4 FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. Hubbell PolyTuff I with nonmetallic liquidtight connectors.
2. Substitutions of approved equals permitted.

B. Description: Interlocked steel construction. Maximum length of 6' for final connections to equipment.

C. Fittings: ANSI/NEMA FB 1.

2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Description: Interlocked steel construction with PVC jacket. Maximum length of 6' for final connections to equipment.

B. Fittings: ANSI/NEMA FB 1.

2.6 ELECTRICAL METALLIC TUBING (EMT)

A. Description: ANSI C80.3; galvanized tubing.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; compression steel type for all applications.

2.7 NONMETALLIC CONDUIT

A. Manufacturers:
1. Carlon Plus 40 and Plus 80 rigid PVC conduit.
2. Substitutions of approved equals permitted.

B. Description: NEMA TC 2; Schedule 40 and Schedule 80 PVC.

C. Fittings and Conduit Bodies: NEMA TC 3.

2.8 NONMETALLIC TUBING

A. Note: Conduit type ENT is NOT allowed.

2.9 TYPE MC AND AC CABLE

A. Type MC and Type AC cable are NOT allowed.

3 PART 3 EXECUTION

3.1 INSTALLATION

A. Install conduit in accordance with NECA "Standard of Installation."

B. Install nonmetallic conduit in accordance with manufacturer's instructions.

C. Arrange supports to prevent misalignment during wiring installation.

D. Support conduit using steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers. In all cases, conduit supports shall be commercially available, conform to code spacing requirements and be recommended by the manufacturer. Galvanized wire, baling wire and pipe strapping are not allowed.

E. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.

F. Fasten conduit supports to building structure and surfaces under provisions of Section 26 05 29.

G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports

H. Do not attach conduit to ceiling support wires.

I. Arrange conduit to maintain headroom and present neat appearance.

J. Route conduit parallel and perpendicular to walls.

K. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

L. Route conduit in and under slab from point-to-point.

M. Maintain adequate clearance between conduit and piping.

N. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.

O. Cut conduit square using saw or pipecutter; de-burr cut ends.

P. Bring conduit to shoulder of fittings; fasten securely.

Q. 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 20 minutes, minimum.

R. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations.

S. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2 inch size.

T. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

U. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.

V. Provide suitable pull string in each empty conduit except sleeves and nipples.

W. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

X. Ground and bond conduit under provisions of Section 26 05 26.

Y. Identify conduit under provisions of Section 26 05 53.

3.2 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements.

B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.

END OF SECTION

SECTION 26 05 34 BOXES

1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Floor boxes.

C. Pull and junction boxes.

1.2 RELATED SECTIONS

A. Section 26 06 20 - Wiring Devices: Wall plates in finished areas.

B. Section 26 05 53 - Electrical Identification.

1.3 REFERENCES

A. NECA - Standard of Installation.

B. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.

C. NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

F. NFPA 70 - National Electrical Code.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Provide Products listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

2 PART 2 PRODUCTS

2.1 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
   1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch male fixture studs where required.

B. Nonmetallic Outlet Boxes: NEMA OS 2.

C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Provide gasketed cover by box manufacturer. Provide threaded hubs.

D. Wall Plates for Finished Areas: As specified in Section 16140.

2.2 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified in Drawings.

3 PART 3 EXECUTION

3.1 EXAMINATION

A. Verify locations of floor boxes and outlets prior to rough-in.

3.2 INSTALLATION

A. Install boxes in accordance with NECA "Standard of Installation."

B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

C. Set wall mounted boxes at elevations to accommodate mounting heights indicated.

D. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Adjust box location up to 10 feet if required to accommodate intended purpose.

E. Orient boxes to accommodate wiring devices oriented as specified in Section 26 06 20.

F. Maintain headroom and present neat mechanical appearance.

G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

I. Install boxes to preserve fire resistance rating of partitions and other elements.

J. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

K. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.

L. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

M. Use flush mounting outlet box in finished areas.

N. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation. Provide minimum 24 inches separation in acoustic rated walls.

O. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

P. Use stamped steel bridges to fasten flush mounting outlet box between studs.

Q. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

R. Use adjustable steel channel fasteners for hung ceiling outlet box.

S. Do not fasten boxes to ceiling support wires.

T. Support boxes independently of conduit.

U. Use gang or sectional box where more than one device is mounted together.

V. Use gang box with plaster ring for single device outlets.

W. Use cast outlet box in exterior locations and wet locations.

X. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.

Y. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.3 INTERFACE WITH OTHER PRODUCTS

A. Coordinate installation of outlet box for equipment connected under other sections of this specification.

3.4 ADJUSTING

A. Adjust flush-mounting outlets to make front flush with finished wall material.

B. Install knockout closures in unused box openings.

3.5 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 26 05 53 ELECTRICAL IDENTIFICATION

1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.2 REFERENCES

A. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR REVIEW

A. Product Data: Provide catalog data for nameplates, labels, and markers.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

2 PART 2 PRODUCTS

2.1 NAMEPLATES AND LABELS

A. Nameplates: Engraved three-layer laminated plastic, white letters on black background.

B. Locations:
1. Each electrical distribution and control equipment enclosure.
2. Communication cabinets.

C. Letter Size:
1. 1/8 inch letters for identifying individual equipment and loads.
2. 1/4 inch letters for identifying grouped equipment and loads.

D. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background. Use only for identification of individual wall switches and receptacles, control device stations.

2.2 WIRE MARKERS

A. Description: Cloth tape, split sleeve, or tubing type wire markers.

B. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.

C. Legend:
1. Power and Lighting Circuits: Branch circuit or feeder number indicated.
2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams.
3. Phase.

D. All conductors and branch circuits shall be color coded as herein specified and strictly in accordance with Article 210 of the National Electric Code.

E. All conductors connected to a 120/208 volt power distribution system shall be color coded as follows:

Phase 1 - Black
Phase 2 - Red
Phase 3 - Blue
Neutral - White
Ground - Green

F. All conductors connected to a 277/480 volt power distribution systems shall be color coded as follows:

Phase 1 - Brown
Phase 2 - Yellow
Phase 3 - Purple
Neutral - Grey
Ground - Green

G. All conductors larger than No. 6 may be color coded by taping of black conductors with the proper color tape where exposed in panel boxes, junction boxes, terminal boxes, etc.

H. All conductors intended solely for grounding of equipment and devices shall be green unless indicated on the drawings to be bare. Green colored conductors shall not be used for other than grounding purposes. All conductors No. 6 and smaller shall be of the colors hereinbefore specified without exceptions. Under no circumstances shall green or white be used for any conductors other than for ground or grounded neutral conductors, respectively. Where 3-phase circuits are connected to 3-phase motors, temporary connections shall be made at motor terminals to determine proper rotation and any reversing of phases shall

be done at the motor terminals in order to maintain proper color coding of phase conductors.

2.3 UNDERGROUND WARNING TAPE

A. Description: 6-inch wide x 4-mil thick minimum plastic tape, colored red with suitable warning legend describing buried electrical lines.

B. Location: Along length of each underground conduit.

3 PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.2 INSTALLATION

A. Install nameplate and label parallel to equipment lines.

B. Secure nameplate to equipment front using screws or adhesive.

C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.

D. Identify underground conduits using one underground warning tape per trench at 12 inches below finished grade.

E. Operational Identification and warnings: Wherever reasonably required to ensure safe and efficient operation and maintenance of electrical systems, and electrically connected mechanical systems and general systems, and to prevent misuse by unauthorized personnel, install self-adhesive plastic signs or similar equivalent identification, instruction or warnings on switches, outlets and other controls, devices and covers of electrical enclosures.

F. All junction boxes shall be labeled to designate circuits contained within each box.

END OF SECTION

SECTION 26 06 20 WIRING DEVICES

1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Device plates and decorative box covers.

1.2 RELATED SECTIONS

A. Section 26 05 34 - Boxes.

1.3 REFERENCES

A. NECA - Standard of Installation.

B. NEMA WD 1 - General Requirements for Wiring Devices.

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements.

D. NFPA 70 - National Electrical Code.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

1.5 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Provide Products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

1.6 EXTRA MATERIALS

A. Furnish two of each style, size, and finish wall plate.

2 PART 2 PRODUCTS

2.1 WALL SWITCHES

A. Single Pole Switch:
   1. Hubbell HBL 1201 color as noted on drawings. Verify color with Architect before ordering.

B. Double Pole Switch:
   1. Hubbell HBL 1222, color as noted on drawings. Verify color with Architect before ordering.

C. Three-way Switch:
   1. Hubbell HBL 1203 color as noted on drawings. Verify color with Architect before ordering.

D. Substitutions: Approved equals.

E. Ratings: In all cases match branch circuit and load characteristics.

2.2 RECEPTACLES

A. Duplex Convenience Receptacle:
   1. Hubbell 2162 mounted at 18" AFF except where otherwise noted. Color as noted on drawings. Verify color with Architect before ordering.

B. GFCI Receptacle:
   1. Hubbell GF5262 color as noted on drawings. Verify color with Architect before ordering.

C. Telephone Jack:
   1. Hubbell 5110813 Category 5e Jack.

D. IG Receptacle:
   1. Hubbell IG5262 color as noted on drawings. Verify color with Architect before ordering. Provide receptacle with distinctive triangle mark. Do not install orange colored receptacles.

E. Emergency Receptacle:
   1. If required on project, all emergency receptacles shall be red in color with red wall plates.

F. Substitutions: Approved equals.

2.3 WALL PLATES

A. Decorative Switch Cover Plate:
   1. Brushed stainless steel is to be used unless otherwise noted on drawings. Verify with Architect before ordering.

B. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device cover.
   1. Hubbell WPSF26.
   2. Substitutions: permitted.

C. Decorative Receptacle Plate:

1. Brushed stainless steel is to be used unless otherwise noted on drawings. Verify with Architect before ordering.

3 PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that outlet boxes are installed at proper height.

B. Verify that wall openings are neatly cut and will be completely covered by wall plates.

C. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install in accordance with NECA "Standard of Installation."

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install receptacles with grounding pole on bottom.

E. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

F. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

G. Connect wiring devices by wrapping conductor around screw terminal.

H. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

I. Coordinate outlet locations with Architect where outlet should be installed behind equipment.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 16130 to obtain mounting heights specified and indicated on drawings.

B. Install wall switch 48 inches above finished floor to top of switch.

C. Install convenience receptacle 18 inches above finished floor unless noted otherwise.

D. Install convenience receptacle 10 inches above counter unless noted otherwise.

E. Install telephone jack 18 inches above finished floor.

3.5 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

F. Verify that each telephone jack is properly connected and circuit is operational.

G. Verify that indicated computer jacks are properly connected and operational.

H. Verify that television jacks are properly connected and operational.

3.6 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

B. Patch any holes, uneven edges, or imperfections showing around the device.

3.7 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 26 28 00 CIRCUIT AND MOTOR DISCONNECTS

1 PART 1 GENERAL

1.1 NOTE

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 SUBMITTALS

A. Provide complete catalog data and drawings on all items of equipment.

1.3 MANUALS

A. Include all submittal data in the operation and maintenance manuals.

1.4 SCOPE

A. Provide all labor, material, equipment, and service necessary for and incidental to the complete electrical distribution system.

2 PART 2 PRODUCTS

2.1 DISCONNECT SWITCHES

A. Unless otherwise noted or required, all disconnect switches shall be UL listed and shall meet NEMA Standard KS1-1983 for Type HD heavy duty switches. Switches shall be unfused unless noted otherwise; quick make, quick break; in NEMA 3R enclosures if exposed to the weather; elsewhere in NEMA 1 general purpose enclosures unless special enclosures are required. All motor circuit switches shall be horsepower rated.

B. Switches shall be Square D or equivalent. 20 amp, single pole disconnects shall be equal 2510 KG-1. Three pole disconnects shall be equal to Square D class 3110.

C. Where space does not permit use of the above specified switches, such as within weatherproof fan housings, etc., use suitable horsepower rated tumbler switches as unfused disconnects.

D. Where disconnect switches are used to disconnect starters, provide auxiliary poles in switches as required to disconnect all auxiliary control circuits in starters.

3 PART 3 EXECUTION

3.1 INSTALLATION

A. Install disconnects on unistrut rack for roof mounted equipment. Do not install solely on stubbed conduit.

END OF SECTION

SECTION 26 51 00 LUMINAIRES

1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior luminaires and accessories.

B. Exterior luminaires and accessories.

C. Emergency lighting units.

D. Exit signs.

E. Ballasts.

F. Fluorescent lamp emergency power supply.

G. Lamps.

H. Luminaire accessories.

I. Motion Detectors (occupancy sensors).

1.2 REFERENCES

A. ANSI C78.379 - Electric Lamps - Incandescent and High-Intensity Discharge Reflector Lamps - Classification of Beam Patterns.

B. ANSI C82.1 - Ballasts for Fluorescent Lamps - Specifications.

C. ANSI C82.4 - Ballasts for High-Intensity Discharge and Low Pressure Sodium Lamps (Multiple Supply Type).

D. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

E. NFPA 70 - National Electrical Code.

F. NFPA 101 - Life Safety Code.

1.3 SUBMITTALS FOR REVIEW

A. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.

B. Product Data: Provide dimensions, ratings, and performance data.

1.4 SUBMITTALS FOR CLOSEOUT

A. Submit manufacturer's operation and maintenance instructions for each product.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

B. ALL DIMMING SYSTEM PANELS, CONTROLS, BALLASTS AND OCCUPANCY SENSORS SHALL BE ALL MANUFACTURED BY THE SAME MANUFACTURER FOR WARRANTY PURPOSES, NO EXCEPTIONS.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Conform to requirements of NFPA 101.

C. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.7 EXTRA PRODUCTS

A. Furnish two of each plastic lens type.

B. Furnish one replacement lamps for each lamp type.

C. Furnish one replacement motion detector for each sensor type.

2 PART 2 PRODUCTS

2.1 LUMINAIRES

A. Manufacturers:
1. Lithonia.
2. Hubbell.
3. Cooper.

B. Size and Type: As scheduled.

2.2 EMERGENCY LIGHTING UNITS

A. Furnish products as specified in schedules.

2.3 EXIT SIGNS

A. Furnish products as specified in schedules.

2.4 LAMPS

A. Lamp Types: LED for all fixtures. Refer to schedules.

B. Reflector Lamp Beam Patterns: ANSI C78.379.

C. All lamps shall be 4000 deg K Exterior and 4000 deg K Interior unless otherwise noted on the schedule.

2.5 MOTION DETECTORS

A. Manufacturers:
1. Lutron

2. ALL DIMMING SYSTEM PANELS, CONTROLS, BALLASTS AND OCCUPANCY SENSORS SHALL BE ALL MANUFACTURED BY THE SAME MANUFACTURER FOR WARRANTY PURPOSES, NO EXCEPTIONS.

B. Size and Type: Dual Technology combining passive infrared and ultrasonic technologies. Unit to provide user-specified time delay, adjustable sensitivity, LED display. Occupancy sensor shall control lighting in the sensed area only. Ceiling or wall-mount as shown on the drawings.

C. Power Supply: Capable of switching a 20 amp ballast load. Power supply shall be capable of parallel wiring without regard to AC phases on primary.

3 PART 3 EXECUTION

3.1 INSTALLATION

A. Install suspended luminaires using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.

B. Support luminaires larger than 2 x 4 foot size independent of ceiling framing.

C. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.

D. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.

E. Install wall mounted luminaires, emergency lighting units and exit signs at height as indicated on Drawings.

F. Install accessories furnished with each luminaire.

G. Connect luminaires, emergency lighting units and exit signs to branch circuit outlets provided under Section 26 05 34 and 26 06 20.

H. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

I. Bond products and metal accessories to branch circuit equipment grounding conductor.

J. Install specified lamps in each emergency lighting unit, exit sign, and luminaire.

K. Locate and aim occupancy sensor in correct location for coverage of room. The contractor shall provide additional sensors if required to properly cover the room. Connect switch leg through power supply of sensor for correct operation.

3.2 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.3 ADJUSTING

A. Aim and adjust luminaires as indicated.

B. Position exit sign directional arrows as indicated.

C. Position motion detectors as required to minimize false operation.

3.4 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosures.

C. Clean photometric control surfaces as recommended by manufacturer.

D. Clean finishes and touch up damage.

3.5 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate luminaire operation for a minimum of two hours.

3.6 PROTECTION OF FINISHED WORK

A. Relamp luminaires that have failed lamps at Substantial Completion.

3.7 COMMISSIONING

A. Provide full and complete commissioning of the entire lighting system and controls.

END OF SECTION

1 PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

B. SECTION 26000, GENERAL PROVISIONS FOR ELECTRICAL

1.2 DESCRIPTION OF WORK

A. This section includes furnishing and installing an Emergency Generator Unit, automatic load transfer system, control system and supervisory system.

1.3 QUALITY ASSURANCE

A. The Supplier of the Emergency Generator shall be responsible for satisfactory total operation of the system. The supplier shall have maintenance personnel, within a 30-mile radius of the project and shall be a single point source for service, parts, and equipment. Any substitution of the model number shown on the plans shall require 15 days prior approval before the bid date.

B. The Supplier of the Emergency Generator Unit shall have had experience with three or more installations of systems of comparable size and complexity as to coordinating, engineering, testing, and start-up. Each of these installations shall have been in successful operation for five or more years.

C. Approved submittal data shall be provided by the Supplier prior to manufacturing or shipment of any component included in this specification. If any equipment, components, etc., are received at the jobsite which have not been reviewed by the Architect and marked “Approved,” same shall be removed, stored, and/or replaced with materials appropriately marked “Approved,” all at no additional cost to the Owner. Any cost arising from the above procedure shall be the responsibility of the Supplier.

D. Factory Test

1. Load Test: Shall include two hours of continuous operation while the set is delivering 100 percent of specified KW at 80 percent power factor. During this test, record the following data at 20-minute intervals:

Time RPM Oil Temperature Out

KW	Water Temperature In	Oil Pressure
Voltage	Water Temperature Out	Ambient Temperature
Amperes	Oil Temperature In	

2. Quick Start Test: Record time required for the engine generator set to develop specified voltage, frequency, and 100% KW load from a stand-still condition. Two (2) tests thus to be performed (per each unit). Unit must achieve start time of 10 seconds or less.

1.4 SUBMITTALS

A. Certified copies of the above tests shall be provided the Architect/Engineer prior to shipment of unit and related equipment.

B. After Award of Contract: Prior to fabrication, submit for approval the following data:

1. Technical data sheets (TDS): These include published performance, rating, and derating curves, published ratings, catalog cuts, pictures, manufacturer's specifications, material composition, gauge thickness, etc.

2. Description of operation (DO): Manufacturer's literature's and, if suitable, diagrams.

3. Calculation (CALC): Detailed engineering calculations with all equations, graphs, assumptions, and approximations shown, and data sources referenced.

4. Shop Drawings (SD): Scaled drawings showing dimensions, plan views, side views, elevations and cross sections.

5. Diagrams (DGM): These include control system diagrams, elementary diagrams, control sequence diagram or table, wiring diagrams, interconnections diagrams, illustrative diagrams, flow diagrams, etc.

6. The following data for each engine generator set, transfer device and control and supervisory equipment:

a. Engine generator set: TDS, SD

b. Engine jacket water heaters: TDS

c. Muffler assembly: TDS, SD

d. Batteries, jacks, and charger: TDS, CALC

e. Control and Supervisory Equipment: TDS, DGM, DO, SD

f. Voltage regulating equipment: TDS

g. Frequency regulating equipment: TDS

h. Voltage and frequency dips and recovery times due to specified motor loading: CALC

i. Antifreeze derating: TDS

j. Ambient derating: TDS

k. Cooling System: DGM

l. Vibration isolators: TDS, CALC

m. Transfer service and control and supervisory equipment: TDS, SD, DGM

7. Installation Manual: Furnish three copies of an installation manual providing installation instructions.

8. Submit for approval a certification in writing that devices and circuits will be incorporated to protect the voltage regulator and other components of the auxiliary electrical power system during operation of the diesel engine generator set at speeds other than the rated RPM while performing maintenance. Include thorough descriptions with submittal of any precautions which will be necessary to protect the voltage regulator and other components of the system during operation of the diesel engine generator set at speeds other than the rated RPM.

9. Transfer Switch Certification: Submit for approval a draft copy of a letter certifying compliance with all the requirements of this specification. Said letter shall be provided on the manufacturer's letter head and signed by an authorized individual in the direct employment of the manufacturer. The certification shall identify, by serial number (s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of submittal, shall be included in the certification.

C. Prior to Final Acceptance, deliver four copies, to the Architect/Engineer, of the following:

1. A certificate by the Supplier of the engine generator set that the auxiliary electrical power system has been properly installed, adjusted and tested.

2. Certified copies of all the construction site test data sheets and reports for the engine generator set and major auxiliaries.

3. Transfer Switch Certification: Submit for approval the final draft copy of a letter certifying compliance with all the requirements of this specification. Said letter shall be provided on the manufacturer's letterhead and signed by an authorized individual in the direct employment of the manufacturers. The certification shall identify, by serial number (s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of submittal, shall be included in the certification.

4. Operation and Maintenance Manuals:

a. Engine - Generator Set:

1) Submit complete operating and maintenance manuals for the engine generator set and auxiliaries including wiring diagrams, technical data sheets and information for ordering replaceable parts.

2) Include complete interconnection diagrams which indicate all components of the system.

3) Include complete diagrams of the internal wiring for each of the items of equipment.

4) The diagrams shall have their terminals identified to facilitate installation, operation, and maintenance.

5) Furnish complete lists of the spare parts and special tools recommended for two years of normal operation of the complete system including the manufacturer's names, addresses, catalog numbers and current prices.

b. Transfer Switches

1) Furnish three copies of complete operating and maintenance manuals for each switch.

1.5 CODES AND STANDARDS

A. National Fire Protection Association (NFPA) Compliance: Comply with applicable construction and installation requirements of the following NFPA standards for stand-by power generator systems:

No. 70 . . . . . .National Electric Code (NEC)

B. Underwriters Laboratories, INC. (UL) Compliance: Comply with applicable constructions and installation requirements of the following UL standards for stand-by power generator systems:

No. 508 . . . . .Electric Industrial Control Equipment

No. 891 . . . . .Dead-Front Electrical Switchboards

No. 50 . . . . .Cabinets and Boxes

C. National Electrical Manufacturers Association (NEMA) Compliance: Comply with applicable construction and installation requirements of the following NEMA standards for stand-by power generator systems:

ICS . . . . .Industrial Control and Systems

IS 4. . . . .Terminal Blocks for Industrial Control Equipment

II 2. . . . . .Electrical Indicating Instrument - Relay

MG 1. . . . . Motors and Generators

MG 2. . . . .Safety Standard for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators

PB 2. . . . .Dead-Front Distribution Switchboards

D. American National Standards Institute (ANSI) Compliance: Comply with applicable construction and installation requirements of the following ANSI standards for stand-by power generator systems:

C37.90a . . . .IEEE Guide for Surge Withstand Capability (SWC) Test

1.6 STORAGE AND HANDLING

A. Design the equipment to withstand the mechanical stresses caused by rough handling during shipment in addition to the electrical and mechanical stresses which occur during operation of the system.

2 PART 2 PRODUCTS

2.1 ENGINE AND ACCESSORIES

A. Engine: The engine shall be powered with Diesel and be of the liquid cooled, 4 Inline Cylinder type. Rated speed shall be not greater than 1800 rpm. The engine shall be rated as a "Standby" source to provide "Standby" KW and KVA outputs as scheduled on the drawings.

1. The engine shall be capable of operating its generator continuously at 100% of rated load at synchronous speed. The piston speed shall not exceed 2000 feet per minute. The engine shall be of the multi-cylinder design with renewable main and rod bearing inserts. The engine and water jacket shall be capable of and suitable for continuous operation at engine water jacket pressures up to 50 psig without causing damage to engine or increased maintenance. Lubrication system shall include a submerged suction positive displacement oil pump (integral with the engine) to provide oil under constant pressure to all important points and shall include a lube oil cooler and efficient filtering system. Air filter of either oil bath or dry type shall be provided.
2. Refer to the cutsheets appended to this specification for additional requirements based on the model number selected for the project.

B. Lubrication Oil System

1. Shall have the following features:

a. Pressurized type.

b. Pump shall be built-in, gear-driven-by-engine, positive displacement type.

c. Full-flow strainer and full-flow or by-pass filters.

d. Where recommended by the manufacturer of the engine, incorporate a pre-lubrication pump.

e. Incorporate an extended lube oil sump drain line passing out through the skid base. Terminate this line with a drain valve and plug.

C. Radiator: A radiator of adequate capacity shall provide all required engine cooling. The fan and radiator shall be of such a design so as to require the minimum BHP for the fan motor. The unit shall have an engine mounted radiator. All temperature controls and an engine driven jacket water circulating pump of the required capacity for circulating radiator cooling water shall be provided. All temperature control valves and an engine driven jacket water circulating pump of circulation through the supply and return piping and to the radiator shall be provided on the engine. Threaded or flanged outlets and inlets connections at the engine and at the radiator shall be provided for the installation of pipe isolators in the radiator piping. A low water alarm shall be provided and it shall activate audible and visual alarms at the unit control panel and the remote annunciator panel.

D. Governor: The engine speed shall be controlled by and adjustable governor to maintain constant speed from no load to full load. Frequency regulation shall be 5% from steady state no load to steady state rated load. Speed variations for constant loads from no load to rated load shall not exceed 0.5% of rated speed with constant ambient and operating temperature.

E. Muffler: An industrial grade type silencer of the required size shall be provided. Muffler inlet shall be connected to the exhaust muffler through a flexible exhaust connector. A suitable flapper type rain cap for vertical discharge of the exhaust shall be provide. Exhaust system shall be installed complete with all fittings, piping, connectors, supports, etc., as required to mount muffler.

F. Antifreeze For Engine Cooling System: Prestone or Zerex permanent type antifreeze and water shall be furnished and installed by the unit manufacturer to properly protect the cooling system down to -30 degrees F.

G. Engine Crankcase Oil: Engine generator manufacturer shall furnish engine crankcase oil of a type recommended by the engine generator manufacturer for his particular engine.

H. Flexible Connections on Unit: All flexible connections between component parts of the engine and all flexible fuel oil or lube oil piping shall be of permanent (non-deteriorating) materials suitable for the intended service. Oil lines shall not permit oil to seep through its pores. Connections between parts of water jacket and/or radiator cooling system shall be rated for a working pressure of not less than 125 psig and a working temperature of not less than 300 degrees F.

2.2 GENERATOR AND ACCESSORIES

A. Generator: Refer to the cutsheets appended to this specification for additional requirements based on the model number selected for the project.

B. Generator Control Panel

1. A fabricated steel dead front NEMA-1 enclosure with louvered and removable panels for access to interior instruments shall be furnished, unit mounted, and shall contain the instruments and controls listed in the cutsheets appended to this specification.

2.3 SUB-BASE

A. The engine and generator shall be mounted as a unit on a sub-base fabricated of structural steel cross braced for rigidity and support, and of size necessary to maintain alignment components. Exposed portions of sub-base shall be finished as indicated in the specifications. A minimum finishing requirement for non-exposed portions of the sub-base shall be cleaning and priming with rust inhibitor.

B. Openings in Sub-Base: Adequate openings shall be provided in sub-base for power and control conduits to enter generator housing. Conduits shall be size and quantity as indicated in the "Electrical Single Line Diagram" and shall be stubbed-up directly under the main circuit breaker enclosure.

C. Diesel Tank: Refer to the cutsheets appended to this specification for the requirements based on the model number selected for the project.

2.4 FINISH

A. All exposed metal parts shall be sanded, cleaned, and primed with a rust inhibitor and finished in a durable machinery enamel. All necessary field touch-up shall be provided so as to have a complete finished appearance at the final inspection. All finishes of outdoor components shall be suitable for outdoor installation without protection from the weather.

2.5 AUTOMATIC TRANSFER SWITCH

A. General

1. General Description

a. The automatic transfer switch shall consist of a power transfer module and a control module, interconnected to provide complete automatic operation. The automatic transfer switch shall be mechanically held and electrically operated by a

single-solenoid mechanism energized from the source to which the load is to be transferred. The switch shall be rated for continuous duty and be inherently double throw. The switch shall be mechanically interlocked to ensure only one of two possible positions - normal or emergency. The automatic transfer switch shall be suitable for use with emergency sources such as an engine or turbine driven generator source or another utility source.

2. Contacts

a. All main contacts shall be of silver composition. They shall be of the blow-on configuration and of segmented construction in ratings 600 amperes and over. The operating transfer time in either direction shall not exceed one-sixth (1/6) of a second.

3. The control module shall be supplied with a protective cover and be mounted separately from the transfer switch for ease of maintenance. The interconnecting wiring harness shall include a disconnect plug to disconnect all wires including both sources of control power for routine maintenance. Sensing and control logic shall be solid-state and mounted on plug-in printed circuit boards. Printed circuit boards shall be keyed to prevent incorrect installation. Interfacing relays shall be industrial control grade plug-in type with dust covers.

4. Inspection of all contacts (moving and stationary) shall be possible from the front of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided from maintenance purposes. The handle shall permit the operator to stop the contacts at any point throughout the entire travel to properly inspect and service the contacts when required.

5. Automatic transfer switches utilizing components of molded-case circuit breakers, contractors, or parts thereof which have not been intended for continuous duty or repetitive load transfer switching are not acceptable.

6. Standards: The automatic transfer switch shall conform to the requirements of NEMA Standard ICS 2-447 and Underwriters' Laboratories UL 1008 and shall be Ul listed as follows:

a. For use in emergency and standby systems in accordance with Articles 700, 701, and 702 of the National Electrical Code.

b. Rated in amperes for total system transfer including control of motors, electric-discharge lamps, electric-heating, and tungsten-filament lamp loads as referred to in Paragraph 30.9 of UL 1008.

c. Switches rated 400 amperes and less shall be suitable for 100% tungsten-filament lamp load. Switches rated above 400 amperes shall be suitable for 30%.

7. Ratings

a. The automatic transfer switch shall be rated to withstand the rms symmetrical short circuit current available at the automatic transfer switch terminals with the type of overcurrent protection, voltage, and X/R ratio as shown on the plans.

8. The automatic transfer switch shall be the product of one manufacturer as the generator and be completely factory interconnected and tested. A prominent and detailed instruction plate shall be furnished for convenient operation. Enclosure construction shall be in accordance with UL and NEMA Standards for industrial controls. The automatic transfer switch shall be Kohler Model KSSB or approved equal, with number of poles rated as shown on the plans.

B. Tests

1. Certified laboratory test data on a switch of the same design and rating shall be provided to confirm the following switching abilities:

a. Overload and endurance at 208 volts AC per Tables 21.2, 23.1, and 23.2 of UL 1008 when enclosed according to Paragraph 1.6.

b. Temperature rise tests after the overload and endurance tests to confirm the ability of the transfer switches to carry their rated current within the allowable temperature limits of the insulation in contact with current-carrying parts.

c. Withstand current tests per the following table:

WITHSTAND CURRENT RATINGS
When Used With
CURRENT LIMITING FUSES

Switch Rating (AMPS)	Available Symmetrical Amperes at 480V A.C. WCR	Max Fuse Size (Amps) RMS
200	200,000	600
400	200,000	600
600	200,000	1200

d. No welding of contacts. Transfer switch must be operable to alternate source after the withstand current tests.

e. Dielectric tests at 1960 volts, rms, minimum after the withstand current test.

2. All production units should be subjects to the following factory tests:

a. The complete automatic transfer switch shall be tested as to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency, and time delay settings are in compliance with the specification requirements.

b. The switch shall be subjected to a dielectric strength test per NEMA Standard ICS 1-109.21.

3. The control panel shall meet or exceed the voltage surge withstand capability in accordance with IEEE Standard 472-1974 (ANSI C37.90a-1974) and the impulse withstand voltage test in accordance with the proposed NEMA Standard ICS 1-109.

C. Operation

1. Three pole switches shall be used for three phase service. Grounding conductor ground bar shall be provided as required in the transfer switch.

2. The automatic transfer switch control panel shall utilize solid-state sensing on normal and emergency for automatic, positive operation. The following shall be provided:

a. For three phase switches, all phase of the normal shall be monitored line-to-line. Close differential voltage sensing shall be provided on all phases. The pickup voltage shall be adjustable from 85% to 100% of nominal and the dropout voltage shall be adjustable from 75% to 98% of the pickup valve. The transfer to emergency will be initiated upon reduction of normal source to 85% of nominal voltage and retransfer to normal shall occur when normal source restores to 90% of nominal.

b. A time delay to override momentary normal source outages to delay all transfer switch and engine starting signals. The time delay shall be field adjustable from 0.5 to 6 seconds and factory set a 1 second.

c. A time delay on retransfer to normal source. The time delay shall be automatically bypassed if the emergency source fails and the normal source is available from 0 to 30 minutes and factory set at 30 minutes.

d. An unloaded running time delay for emergency generator cooldown. The time delay shall be field adjustable from 0 to 5 minutes and factory to emergency, where indicated.

e. A time delay on transfer to emergency. Initially set at zero but field adjustable up to 1 minute for controlled timing of load transfer to emergency, where indicated.

f. Independent three phase voltage and frequency sensing of the emergency source for three phase switches. The pickup voltage shall be adjustable from 85% to 100% of nominal. Pickup frequency shall be adjustable from 90% to 100% nominal. Transfer to emergency upon normal source failure when emergency source voltage is 90% or more of nominal and frequency is 95% or more of nominal.

g. A phase reversal relay to monitor commercial power input to transfer switch and prevent switch transfer to normal switch and prevent switch transfer to normal power source if normal power source phase rotation is not the same as the phase rotation of the emergency source.

h. A contact that closes when normal source fails for initiating engine starting, rated 10 amps, 32 VDC. Contacts to be gold plated for low voltage service.

i. A green signal light to indicate when the automatic transfer switch is connected to the normal source. A red signal light to indicate when the automatic transfer switch is connected to the emergency source.

j. One auxiliary contact that is closed when automatic transfer switch is connected to normal and one auxiliary contact that is closed when automatic transfer switch is connected to emergency. Rated 10 amps, 480 volts, 60 Hz AC.

k. A test switch to momentarily stimulate normal source failure.

D. Identification: A permanent, stamped metal identification plate shall be mounted on front plate inside the switch housing. This identification plate shall identify manufacturer, serial number, model number, volts, phase, ampere rating and date of construction.

E. Enclosure: The enclosure for the automatic transfer shall be side by side front and side accessible only. The enclosure shall be constructed for the NEMA 1 standard. Back to back and rear accessible switches shall not be permitted.

1. Wire Bending Space: The number and size of conductors are specified in the drawings. The enclosure shall have top and bottom wire bending space sized in accordance with Attachment 1, NEC Table 373-6(b) (bound in this specification) for the largest conductor entering or leaving the enclosure. Side wire bending space shall be in accordance with Attachment 1, NEC Table 373-6(b) (bound in this specification) for the largest conductor to be terminated in that space.

2. Lugs: The number and size of conductors are specified in the drawings. Lugs for connection of each conductor including neutrals and grounding conductors shall be furnished with the switch. When is place, the spacing between bare metal parts shall be in accordance with Attachment 1, NEC Table 384-26 (bound in this specification).

3. Dead Front: Each device shall be mounted in the enclosure and enclosure shall be designed for the purpose and shall be dead front. If the enclosure is mounted where accessible to other than authorized personnel, is shall be supplied with hinged door capable of being padlocked.

4. Shop drawings: The shop drawings shall provide adequate information for the Installing Contractor to correctly rough-in the electrical services for the main circuit breaker. Any changes, extensions, alterations, etc., to these rough-ins required due to the inaccuracy of the shop drawings shall be the responsibility of the Supplier. It shall be the Supplier's option to perform the corrective work or to engage the Installing Contractor to perform the corrective work. All corrective work shall be accomplished at no additional cost to the Owner. If the Supplier fails to initiate and cause the corrective work to be accomplished within a reasonable time frame which will prevent the completion of the work on schedule, the Owner/Engineer shall authorize a qualified Contractor to perform the required work and the cost shall be forwarded to the Supplier, or the Owner shall pay for the corrective work and deduct these cost from the Supplier's payment.

F. Certification: The manufacturer shall provide a notarized letter certifying compliance with all the requirements of this specification. Said letter shall be provided on the manufacturer's letterhead and signed by an authorized individual in the direct employment of the manufacturer. A draft copy of this letter shall be provided with the submittal. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of submittal, shall be included in the certification.

G. Operator's Manual: Each switch shall be furnished with three copies of an operator's manual providing installation and operating instructions.

2.6 ELECTRICAL WIRING, GENERAL

A. The emergency generator and transfer switch shall be furnished pre-wired to the construction site. This pre-wiring shall include all power wiring, control wiring, interlock wiring, and alarm wiring for each piece of equipment except for the following:

1. Power wiring from main circuit breaker to transfer switch.

2. "Commercial" power wiring to transfer switch.

3. "Load" power wiring from transfer switch.

4. Control wiring from transfer switch to emergency generator.

B. All factory wiring shall be accomplished in accordance with these specifications and acceptable good practices.

C. All terminals for field connections (power, control, and alarm) shall be identified and clearly described in the submittal, shop drawing, wiring diagrams, etc., to facilitate final connections by the Installing Contractor.

D. Lugs shall be in place on the terminals of all power connections.

3 PART 3 EXECUTION

3.1 INSTALLATION

A. Foundations

1. Where indicated on the drawings, provide reinforced concrete foundation as part of the work of Division 16.

2. Concrete, formwork, and reinforcing to be as specified in Division 3.

B. Mounting

1. Support the base of generator set on vibration isolators, each isolator bolted to the foundation (pad), base bolted to isolator.

C. Connect all components of the auxiliary electrical power system so that they will continue to be energized by the auxiliary electrical power system during failures of the normal electrical power supply system.

D. Control and Signal Systems: Furnish, install and connect conduits and wiring devices for complete fully operational control and signal systems.

3.2 TECHNICAL SERVICES DURING INSTALLATION AND TESTS

A. At the construction site, provide the services of a competent, factory-trained engineer or technical employed by the Supplier of the diesel emergency-generator set to technically supervise and participate during all of the adjustments and tests for the set and major auxiliaries. Adjustments and tests shall be made in the presence of the Owner's and/or Architect's representative

B. When the complete stand-by electrical power system has been installed and prior to the final inspection test all components of the system in the presence of the Owner's and/or Architect's representative for proper operation of the

individual components and the complete system and to eliminate electrical and mechanical defects.

C. Test data shall be collected and recorded on the following: time of day, coolant temperature, operating oil pressure, battery charging rate, cranking time, crank-to-rated frequency time, voltage and frequency overshoot, load assumption-to-steady state voltage and frequency stabilization time, operating voltage, frequency, current, kilowatts, and power factor.

1. Procedure: With the building load operating at normal, initiate a power failure by disconnecting the normal power supply to the facility. Monitor battery charge rate at 5 minute intervals for the first 15 minutes and 15 minute intervals thereafter. Continue monitoring and recording load test for 2 hours noting any abnormal resultant effects on voltage, frequency, and current from load changes. After the 2 hour running test, return normal power to the facility and record the time delays to retransfer and engine-generator shutdown. Wait for 5 minutes after shut-down and immediately initiate another normal power failure. Immediately upon reaching rated frequency, apply full rated nameplate KW (facility load with supplemental load bank if required) in one step. Record all test data as specified earlier, operate the engine-generator at nameplate KW for one hour noting any abnormal voltage, current, or frequency changes.

D. Any defects which become evident during the above tests shall be corrected by the Supplier at his own expense.

1. Certified copies of all of the factory and construction site test data sheets and reports for the emergency-generator set and major auxiliaries shall be provided to the Architect.

2. Furnish the services of a competent, factory-trained engineer or technician for one 2-hour period for instructing personnel in operation and maintenance of the equipment, on the date requested by the Owner.

3.3 REMOTE ANNUNCIATOR

A. Furnish and install generator annunciator with manufacturer's standard items in radio dispatch room/control room. Replace the existing annunciator in the same location.

END OF SECTION
REFER TO CUT SHEETS APPENDED TO THIS SPECIFCATION FOR ADDITIONAL INFORMATION

KOHLER®

Model: 80REOZJF

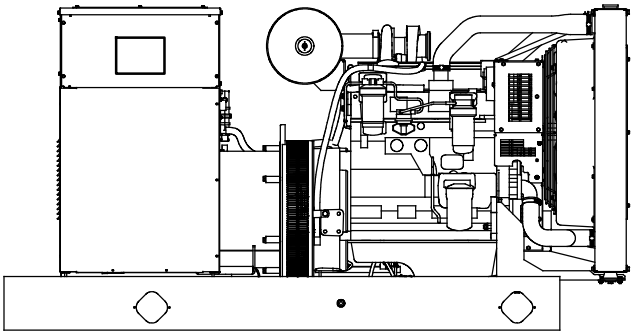
208- 600 V **Diesel**

ISO 9001 KOHLER® NATIONALLY REGISTERED

Tier 3 EPA-Certified for Stationary Emergency Applications

Ratings Range

		60 Hz
Standby:	**kW**	63- 83
	kVA	63- 104
Prime:	**kW**	58- 76
	kVA	58- 95



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all generator set systems and components. Two- and five-year extended limited warranties are also available.
- Alternator features:
  - The unique Fast-Response® X excitation system delivers excellent voltage response and short-circuit capability using a rare-earth, permanent magnet (PM)-excited alternator.
  - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
  - Kohler designed controllers for one-source system integration and remote communication. See Controllers on page 3.
  - The low coolant level shutdown prevents overheating (standard on radiator models only).
  - Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
  - Mount up to three circuit breakers to allow circuit protection of selected priority loads (maximum two circuit breakers with the 4P10X alternator).

Generator Set Ratings

				130°C Rise Standby Rating		105°C Rise Prime Rating	
Alternator	**Voltage**	**Ph**	**Hz**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**
4P10X	120/208	3	60	77/96	267	71/89	246
	127/220	3	60	80/100	262	74/93	243
	120/240	3	60	77/96	232	71/89	213
	120/240	1	60	63/63	263	58/58	242
	139/240	3	60	81/101	244	74/93	223
	220/380	3	60	70/88	133	65/81	123
	277/480	3	60	81/101	122	74/93	111
	347/600	3	60	81/101	97	74/93	89
4R9X	120/208	3	60	83/104	288	76/95	264
	127/220	3	60	83/104	272	76/95	249
	120/240	3	60	83/104	250	76/95	229
	120/240	1	60	76/76	317	70/70	292
	139/240	3	60	83/104	250	76/95	229
	220/380	3	60	83/104	158	76/95	144
	277/480	3	60	83/104	125	76/95	114
	347/600	3	60	83/104	100	76/95	91
4T9X	120/240	1	60	81/81	338	74/74	308

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. *Standby Ratings:* The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. *Prime Power Ratings:* At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Rare-Earth, Permanent-Magnet
Leads: quantity, type	
4PX, 4RX	12, Reconnectable
4TX	4, 120/240 V
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H
Temperature rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load	Controller Dependent
One-step load acceptance	100% of Rating
Unbalanced load capability	100% of Rated Standby Current

- 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.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.

Specifications		Alternator
Peak motor starting kVA:		(35% dip for voltages below)
480 V	4P10X (12 lead)	275
480 V	4R9X (12 lead)	385
240 V	4T9X (4 lead)	237

Application Data

Engine

Engine Specifications	
Manufacturer	John Deere
Engine model	4045HF285H
Engine type	4-Cycle, Turbocharged, Charge Air-Cooled
Cylinder arrangement	4 Inline
Displacement, L (cu. in.)	4.5 (276)
Bore and stroke, mm (in.)	106 x 127 (4.19 x 5.00)
Compression ratio	19:1
Piston speed, m/min. (ft./min.)	457 (1500)
Main bearings: quantity, type	5, Replaceable Insert
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	99 (133)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Valve material:	
Intake	Chromium-Silicon Steel
Exhaust	Stainless Steel
Governor: type, make/model	JDEC Electronic L16 Denso HP3
Frequency regulation, no-load to full-load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Exhaust

Exhaust System	
Exhaust manifold type	Dry
Exhaust flow at rated kW, m^3/min. (cfm)	19.2 (679)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	579 (1074)
Maximum allowable back pressure, kPa (in. Hg)	7.5 (2.2)
Exhaust outlet size at engine hookup, mm (in.)	98 (3.86)

Engine Electrical

Engine Electrical System	
Battery charging alternator:	12 Volt
Ground (negative/positive)	Negative
Volts (DC)	12
Ampere rating	65
Starter motor rated voltage (DC)	12
Battery, recommended cold cranking amps (CCA):	
Quantity, CCA rating each	One, 640
Battery voltage (DC)	12

Fuel

Fuel System	
Fuel supply line, min. ID, mm (in.)	11.0 (0.44)
Fuel return line, min. ID, mm (in.)	6.0 (0.25)
Max. lift, fuel pump: type, m (ft.)	Engine-Driven, 1.8 (6.0)
Max. fuel flow, Lph (gph)	62.5 (16.5)
Max. return line restriction, kPa (in. Hg)	20 (5.9)
Fuel prime pump	Manual
Fuel filter	
Primary	30 Microns
Secondary	2 Microns @ 98% Efficiency
Water Separator	Yes
Recommended fuel	#2 Diesel

Lubrication

Lubricating System	
Type	Full Pressure
Oil pan capacity, L (qt.) §	14.7 (15.5)
Oil pan capacity with filter, L (qt.) §	15.6 (16.5)
Oil filter: quantity, type §	1, Cartridge
Oil cooler	Water-Cooled

§ Kohler recommends the use of Kohler Genuine oil and filters.

Application Data

Cooling

Radiator System	
Ambient temperature, °C (°F) *	50 (122)
Engine jacket water capacity, L (gal.)	8.5 (2.25)
Radiator system capacity, including engine, L (gal.)	20.1 (5.3)
Engine jacket water flow, Lpm (gpm)	155 (41)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	54.4 (3096)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	13.5 (768)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	600 (23.6)
Fan, kWm (HP)	6.6 (8.8)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)

* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).
Snow package enclosure with enclosed silencer reduces ambient temperature capability by 10°C (18°F).

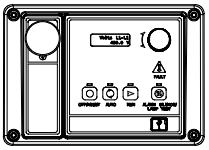
Operation Requirements

Air Requirements	
Radiator-cooled cooling air, m^3/min. (scfm)‡	142 (5000)
Combustion air, m^3/min. (cfm)	6.9 (244)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	22.9 (1300)
Alternator, kW (Btu/min.)	9.8 (560)

‡ Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

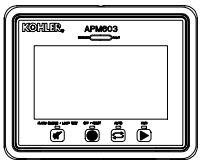
Fuel Consumption		
Diesel, Lph (gph) at % load	**Standby Rating**	
100%	26.1	(6.9)
75%	21.2	(5.6)
50%	15.5	(4.1)
25%	8.3	(2.2)
Diesel, Lph (gph) at % load	**Prime Rating**	
100%	23.8	(6.3)
75%	19.3	(5.1)
50%	14.4	(3.8)
25%	7.9	(2.1)

Controllers



APM402 Controller
Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.
- Digital display and menu control provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or serial configuration
- Controller supports Modbus® protocol
- Integrated hybrid voltage regulator with ±0.5% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-161 for additional controller features and accessories.



APM603 Controller
Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.
- 7-inch graphic display with touch screen and menu control provides easy local data access
- Measurements are selectable in metric or English units
- Load management to connect and disconnect loads as required
- Controller supports Modbus® RTU, Modbus® TCP, SNMP and BACnet®
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- UL-listed overcurrent protective device
- NFPA 110 Level 1 capability

Refer to G6-162 for additional controller features and accessories.

Modbus® is a registered trademark of Schneider Electric.

BACnet® is a registered trademark of ASHRAE.

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

Standard Features

- Alternator Protection
- Battery Rack and Cables
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

Available Options

Circuit Breakers

Type

- ❑ Magnetic Trip
- ■ Thermal Magnetic Trip
- ❑ Electronic Trip (LI)
- ❑ Electronic Trip with Short Time (LSI)
- ❑ Electronic Trip with Ground Fault (LSIG)

Rating

- ❑ 80%
- ❑ 100%

Circuit Breaker Mounting

- ■ Generator Mounted
- ❑ Remote Mounted
- ❑ Bus Bar (for remote mounted breakers)

Enclosures for Remote Mounted Circuit Breakers

- ❑ NEMA 1
- ❑ NEMA 3R

Approvals and Listings

- ❑ California OSHPD Approval
- ❑ CSA Certified
- ❑ IBC Seismic Certification
- ❑ UL 2200 Listing
- ❑ Hurricane Rated Enclosure

Enclosed Unit

- ❑ Snow Enclosure (sound enclosure with enclosed critical silencer, intake hood, and electrical package)
- ❑ Sound Enclosure (with enclosed critical silencer)
- ■ Weather Enclosure (with enclosed critical silencer)

Open Unit

- ❑ Exhaust Silencer, Critical (kit: PA-354809)
- ❑ Flexible Exhaust Connector, Stainless Steel

Fuel System

- ❑ Flexible Fuel Lines
- ❑ Fuel Pressure Gauge
- ■ Subbase Fuel Tanks

Controller

- ❑ Common Failure Relay (APM603 controller only)
- ■ Two Input/Five Output Module (APM402 controller only)
- ❑ Four Input/Fifteen Output Module (APM603 controller only)
- ❑ Lockable Emergency Stop Switch
- ■ Remote Emergency Stop Switch
- ■ Remote Serial Annunciator Panel
- ❑ Run Relay (standard with APM603, optional with others)
- ❑ Manual Key Switch (APM603 controller only)
- ❑ Manual Speed Adjust (APM402 controller only)

Cooling System

- ■ Block Heater, 1500 W, 90- 120 V, 1 Ph
  Required for ambient temperature below 0°C (32°F)
- ❑ Radiator Duct Flange

Electrical System

- ❑ Generator Heater
- ❑ Battery
- ■ Battery Charger, Equalize/Float Type
- ❑ Battery Heater

Miscellaneous

- ■ Air Cleaner, Heavy Duty
- ❑ Air Cleaner Restriction Indicator
- ■ Certified Test Report
- ❑ Crankcase Emissions Canister
- ❑ Engine Fluids Added
- ❑ Rated Power Factor Testing
- ❑ Rodent Guards

Literature

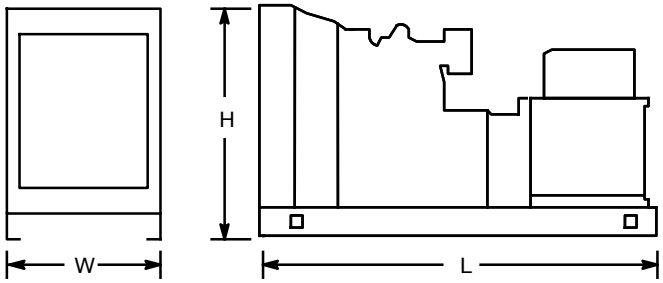
- ❑ General Maintenance
- ❑ NFPA 110
- ❑ Overhaul
- ❑ Production

Warranty

- ■ 2-Year Basic Limited Warranty
- ❑ 5-Year Basic Limited Warranty
- ❑ 5-Year Comprehensive Limited Warranty

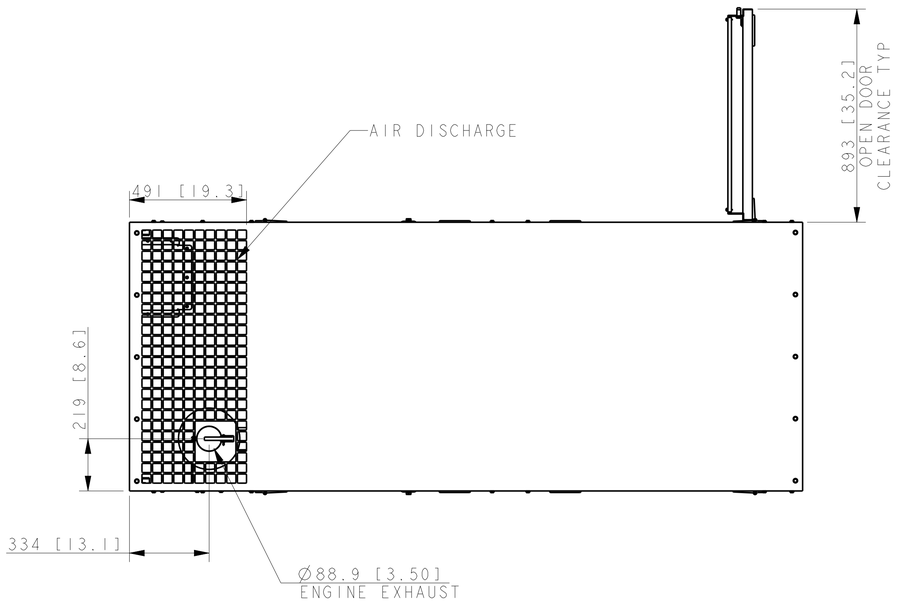
Dimensions and Weights

Overall Size, L x W x H, mm (in.):
Wide Skid: See Enclosure ADV Drawing
Narrow Skid: 2334 x 864 x 1216 (91.89 x 34.02 x 47.90)
Weight (radiator model), wet, kg (lb.): 1125 (2480)



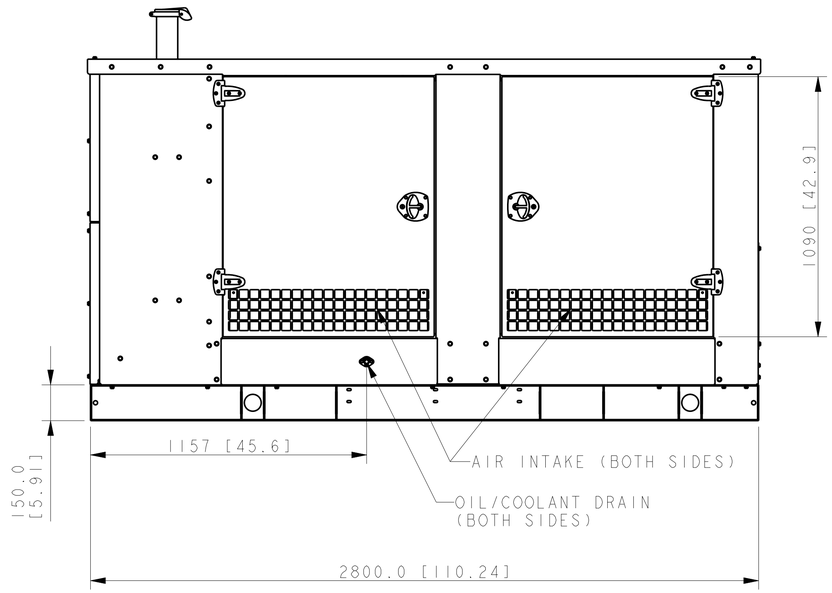
NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

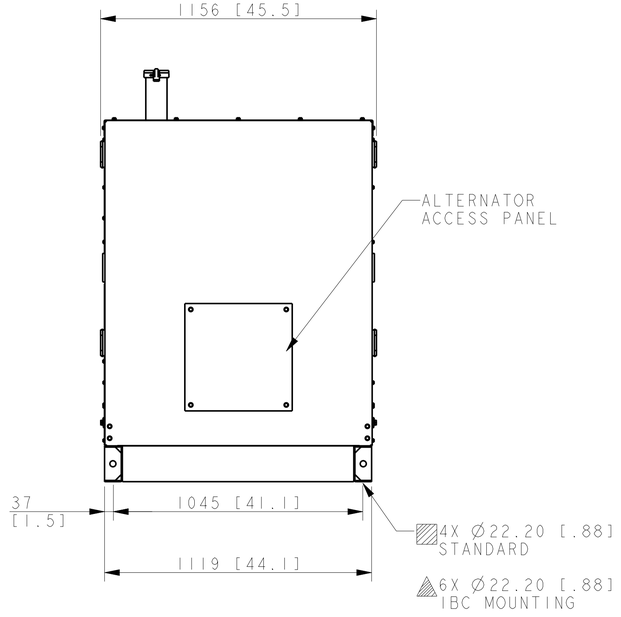
DISTRIBUTED BY:

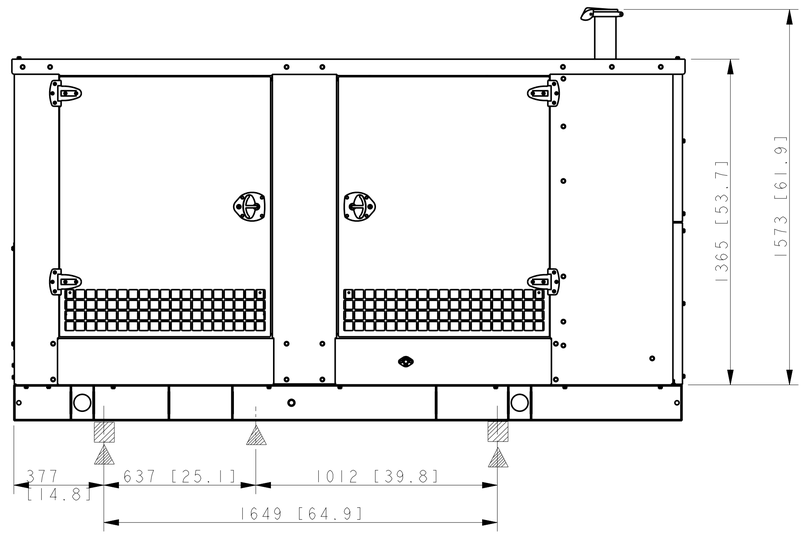


MODEL	ENCLOSURE WEIGHT KG [LBS]
STEEL WEATHER	318 [700]
STEEL SOUND	329 [725]
ALUMINIUM SOUND	204 [450]

NOTE:
1. IF TANK IS ORDERED, ENCLOSURE MOUNTS DIRECTLY TO TANK
2. TANK MAY EXTEND BEYOND ENCLOSURE (DISCHARGE END ONLY)







80 MODEL 4S7, 4S9, 4V9, 4P10X, 4R9X, 4T9X
100 MODEL 4S9, 4S11, 4V11, 4R9X, 4R12X, 4T12X
RECONNECTABLE
IMPROVE MOTOR STARTING (IMS) RECONNECTABLE
600V & 1 PHASE ALTERNATORS
4045HF285 JOHN DEERE TIER III

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
B	9-28-10	(A-4) 6X Ø22.20 ADDED, 4X Ø22.20 WAS 4X Ø25.4 *(A-3) DIM 635 AND 1014 ADDED [90301]	SAM
C	1-31-11	(A-7) 1159 WAS 1084 [90327]	SAM
D	12-22-11	(A-4) 4P10X, 4R9X, 4T9X ADDED TO 80 MODEL, 4R9X, 4R12X, 4T12X ADDED TO 100 MODEL [92681]	PKD
E	2-4-13	(A-1) 1-2 WAS 1-2, SEE SHEET 2 [CT32174]	SAM
F	10-12-17	(C-7) DIM. Ø88.9 [3.50] ADDED [CT177004]	SRM

UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	KDW	7-9-09
CHECKED	KDW	7-9-09
APPROVED	ALC	7-9-09

KOHLER CO. METRIC PRO-E

POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

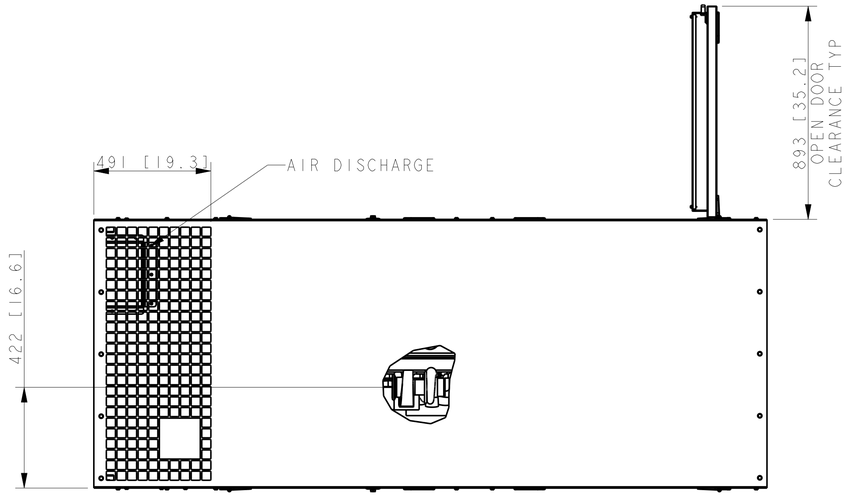
TITLE: DIMENSION PRINT

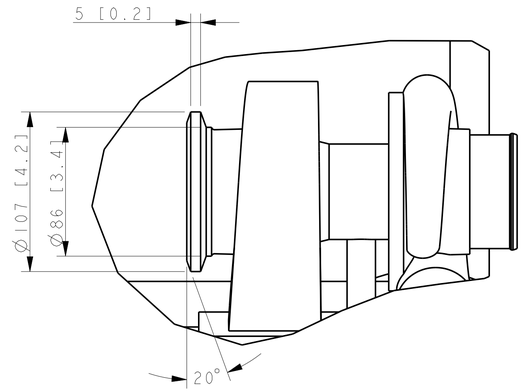
SCALE 0.08 | CAD NO. | SHEET 1 of 2

DWG NO. ADV-7647 | D

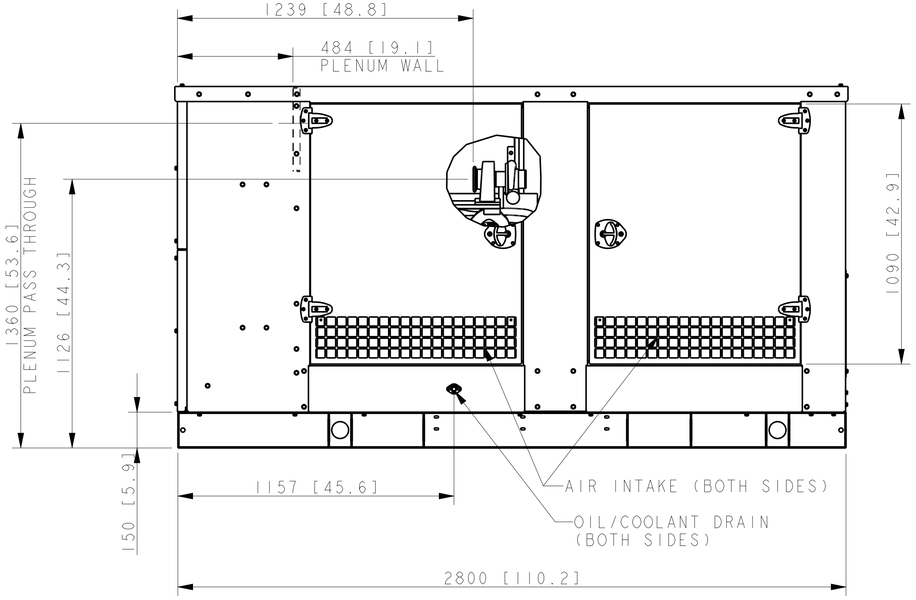
NOTE:
1. IF TANK IS ORDERED, ENCLOSURE MOUNTS DIRECTLY TO TANK
2. TANK MAY EXTEND BEYOND ENCLOSURE (DISCHARGE END ONLY)

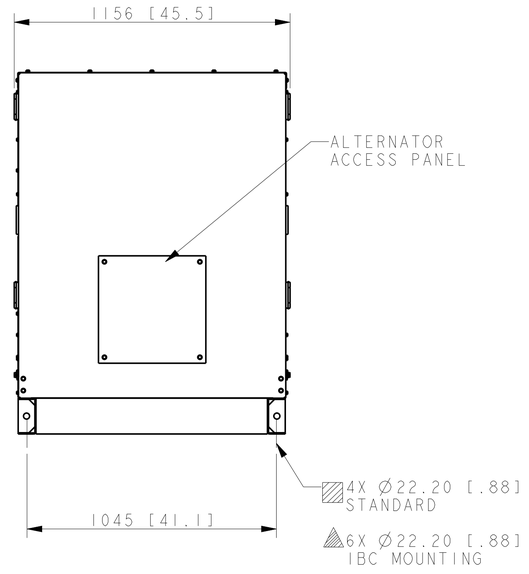
MODEL	ENCLOSURE WEIGHT KG [LBS]
STEEL WEATHER	292 [643]
STEEL SOUND	303 [668]
ALUMINIUM SOUND	178 [393]

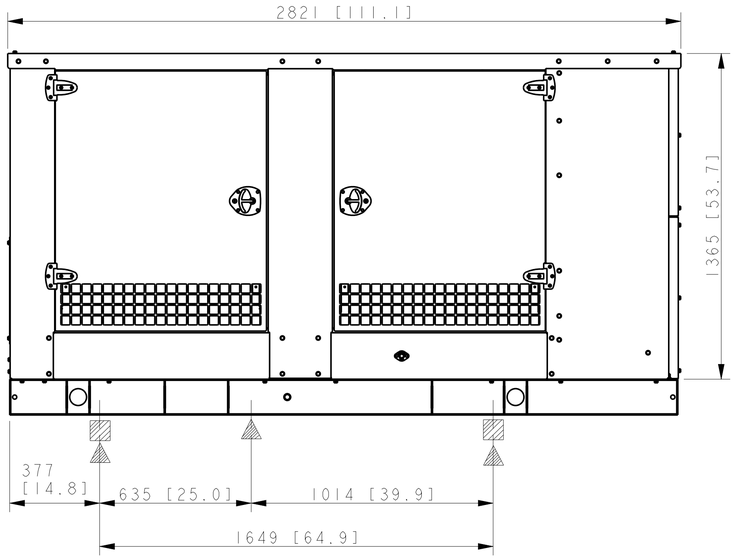




EXHAUST OUTLET
SCALE 0.500







CA AQMD READY ENCLOSURES
(NO SILENCER)

80 MODEL 4S7, 4S9, 4V9, 4P10X, 4R9X, 4T9X
100 MODEL 4S9, 4S11, 4V11, 4R9X, 4R12X, 4T12X
RECONNECTABLE
IMPROVE MOTOR STARTING (IMS) RECONNECTABLE
600V & 1 PHASE ALTERNATORS
4045HF285 JOHN DEERE TIER III

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
E	2-4-13	SHEET 2 AND AQMD MODEL ADDED [CT32174]	SAM
F	10-12-17	SEE SHEET 1 [CT177004]	SRM

UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	SAM	2-4-13
CHECKED	KEM	2-4-13
APPROVED	KEM	2-4-13

KOHLER CO. METRIC PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE
DIMENSION PRINT

SCALE 0.08 | CAD NO. | SHEET 2 of 2
DWG NO. ADV-7647 | D

KOHLER®

Model KSSB

Automatic Transfer Switches
Standard Specific Breaker Rated

ISO 9001 KOHLER® NATIONALLY REGISTERED

Available Controllers

- Decision-Maker® MPAC 1200

Ratings

Current	Voltage	Frequency
30- 1200 amps	208- 600 VAC	50/60 Hz

Transfer Switch Standard Features

- UL 1008 listed
  file # E58962 (automatic), # E86894 (nonautomatic)
- CSA certification available
- IBC seismic certification available
- Available in 2, 3, or 4 pole configurations
- Electrically operated, mechanically held mechanism
- High withstand and close-on ratings
- Design suitable for emergency and standby applications on all classes of load, 100% tungsten rated through 400 amps
- Silver alloy main contacts
- Gold-flashed engine start contacts
  rated 2 amps @ 30 VDC/250 VAC
- Front-accessible contacts for easy inspection
- Front-replaceable main and arcing contacts (800- 1200 amps)
- Reliable, field-proven solenoid mechanism
- Switching mechanisms lubricated for the expected life of the transfer switch
- Internal manual operating handle
- Main shaft auxiliary position-indicating contacts
  rated 10 amps @ 32 VDC/250 VAC
- NEMA type 1, 12, 3R, 4, and 4X enclosures available
- Standard one-year limited warranty. Extended limited warranties are available.
- Standard-transition operation with either automatic or non-automatic control
- Standard-transition transfer time less than 100 milliseconds (6 cycles @ 60 Hz)
- Double-throw, mechanically interlocked design
  (break-before-make power contacts)
- Solid, switched, or overlapping (make-before-break) neutral

Automatic Transfer Switch Controller

Decision-Maker® MPAC 1200 Controller

- LCD display, 4 lines x 20 characters, backlit
- Complete programming and viewing capability at the door using the keypad and LCD display
- LED indicators: Source available, transfer switch position, service required (fault), and “not in auto”
- Programmable voltage and frequency pickup and dropout settings
- Programmable time delays
- Programmable generator exerciser
- Time-based load control
- Two programmable inputs and two programmable outputs
- Up to four I/O extension modules available
- Modbus communication standard
- RS-485 communication standard
- Ethernet communication optional

For more information about Decision-Maker® MPAC 1200 features and functions, see specification sheet G11-127.

Codes and Standards

The ATS meets or exceeds the requirements of the following specifications:

- CSA C22.2 No. 178 certification available, file #LR58301
- EN61000-4-4 Fast Transient Immunity Severity Level 4
- EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
- IEC Specifications for EMI/EMC Immunity:
  - CISPR 11, Radiated Emissions
  - IEC 1000-4-2, Electrostatic Discharge
  - IEC 1000-4-3, Radiated Electromagnetic Fields
  - IEC 1000-4-4, Electrical Fast Transients (Bursts)
  - IEC 1000-4-5, Surge Voltage
  - IEC 1000-4-6, Conducted RF Disturbances
  - IEC 1000-4-8, Magnetic Fields
  - IEC 1000-4-11, Voltage Dips and Interruptions
- IEEE Standard 446, IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- IEEE 472 (ANSI C37.90A) Ring Wave Test
- NEMA Standard ICS 10-2005, Electromechanical AC Transfer Switch Equipment
- NFPA 70, National Electrical Code
- NFPA 99, Essential Electrical Systems for Health Care Facilities
- NFPA 110, Emergency and Standby Power Systems
- Seismic certification in accordance with the International Building Code is available. (Accessory kit is required for seismic certification.)
  - IBC 2000, referencing ASCE 7-98 and ICC AC-156
  - IBC 2003, referencing ASCE 7-02 and ICC AC-156
  - IBC 2006, referencing ASCE 7-05 and ICC AC-156
  - IBC 2009, referencing ASCE 7-05 and ICC AC-156
  - IBC 2012, referencing ASCE 7-10 and ICC AC-156
- Underwriters Laboratories UL 1008, Standard for Automatic Transfer Switches for Use in Emergency Standby Systems file #E58962 (automatic), #E86894 (nonautomatic)

Application Data

Environmental Specifications	
Operating Temperature	- 20°C to 70°C (- 4°F to 158°F)
Storage Temperature	- 40°C to 85°C (- 40°F to 185°F)
Humidity	5% to 95% noncondensing

Input and Output Connection Specifications	
Component	**Wire Size Range**
Main board I/O terminals	#12- 24 AWG
I/O module terminals	#14- 24 AWG

Auxiliary Position Indicating Contacts (rated 10 amps @ 32 VDC/250 VAC)	
Switch Rating, Amps	**Number of Contacts Indicating Normal, Emergency**
30- 230	2, 2
260- 1200	8, 8

Cable Sizes

Note: Cable size data is subject to change. Refer to the transfer switch dimension drawings and wiring diagrams for planning and installation.

UL-Listed Solderless Screw-Type Terminals for External Power Connections				
Range of Wire Sizes, Copper or Aluminum *				
Model	**Switch Rating, Amps**	**Normal, Emergency, and Load (per phase)**	**Neutral (3-pole)**	**Ground**
KSS	30- 150	(1) #14 AWG to 4/0 AWG	(3) #14 to 4/0 AWG	(3) #6 to 3/0 AWG
	200	(1) #14 AWG to 4/0 AWG *Cu only*	(3) #14 to 4/0 AWG *Cu only*	(3) #6 to 3/0AWG
	230 (208- 480 V)			
	230 (600 V)	(1) #4 AWG to 600 KCMIL or (2) 1/0 AWG to 250 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 AWG to 250 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 AWG to 250 KCMIL
	260- 400			
	600	(2) #2 AWG to 600 KCMIL	(6) #2 AWG to 600 KCMIL	(3) #4 AWG to 600 KCMIL or (6) 1/0 to 250 KCMIL
	800- 1000	(4) 1/0 AWG to 750 KCMIL	(12) 1/0 AWG to 750 KCMIL	
	1200 (NEMA 3R)			
	1200 (NEMA 1)	(4) 1/0 AWG to 750 KCMIL	(12) 1/0 AWG to 750 KCMIL	(3) #4 AWG to 500 KCMIL
* Use 75°C minimum Cu/Al wire for power connections.				

Weights and Dimensions

Note: Always use the transfer switch dimension drawing for planning and installation. Weights and dimensions may vary for different configurations. See your local distributor for dimension drawings.

Weights and dimensions are shown for NEMA Type 1 enclosures, NEMA Type 3R enclosures and open units. See the transfer switch dimension drawings for other enclosure types.

Model	Amps	NEMA Type	Poles	Wires	Dimensions mm (in.) Height	Width	Depth	Weight kg (lb.) 2-Pole	3-Pole	4-Pole	Dimension Drawing
KSS	30- 200	1, 3R	2,3,4	3, 4	791 (31)	450 (18)	314 (12.4)‡	28 (62)	30 (65)	31 (68)	ADV-8566
	230 (208- 480V)		2,3,4	3, 4	1223 (48)	560 (22)	362 (14.3)‡	52 (115)	56 (123)	59 (131)	ADV-8568
	230 (600 V) 260- 600		2,3,4	3, 4	1702 (67)	610 (24)	514 (20.2)‡	179 (395)	183 (403)	188 (414)	ADV-8570
	800		2,3,4	3, 4	1932 (76)*	864 (34)	515 (20.3)‡	220 (485)	231 (510)	238 (525)	ADV-8572
	1000		3,4	4	1932 (76)*	864 (34)	515 (20.3)‡	—	231 (510)	238 (525)	ADV-8572
	1200	1	3,4	4	2286 (90)	963 (38)	688 (27.1)	—	356 (785)	379 (835)	ADV-8574
		3R	3,4	4	2286 (90)	940 (37)	717 (28.2)	—	356 (785)	379 (835)	ADV-8575
	30- 200	Open Unit §	2,3,4	3, 4	787 (31)	445 (18)	296 (11.6)	8 (17)	9 (20)	11 (23)	ADV-7182
	230 (208- 480V)		2,3,4	3, 4	1219 (48)	457 (18)	330 (13.0)	17 (37)	21 (45)	24 (53)	
	230 (600V) 260- 600		2,3,4	3, 4	1422 (56)	610 (24)	362 (14.3)	31 (68)	34 (74)	36 (80)	
	800		2,3,4	3, 4	1829 (72)	864 (34)	508 (20)	68 (150)	78 (170)	90 (196)	
	1000		3,4	4	1829 (72)	864 (34)	508 (20)	—	78 (170)	90 (196)	
	1200		3,4	4	2210 (87)	965 (38)	584 (23)	—	78 (170)	90 (196)	

* Includes mounting feet
‡ On 30- 1000 amp models, the NEMA type 3R enclosures have a security cover on the controller that extends 54 mm (2.1 in.) beyond the door.
§ Dimensions shown for open units are the minimum required enclosure size. Open unit weights are shipping weights for the contactor only.

Withstand and Close-On Ratings (WCR)

Standard, Programmed, and Closed-Transition Models

Maximum current in RMS symmetrical amperes when coordinated with customer-supplied fuses or circuit breakers. All values are available symmetrical RMS amperes and tested in accordance with the withstand and close-on requirements of UL 1008. Application requirements may permit higher withstand ratings for certain size switches. Contact the factory for assistance.

Model	Switch Rating, Amps	Withstand Current Ratings in RMS Symmetrical Amperes						
		Current-Limiting Fuses				Specific Breaker		
		480 V Max.	600 V Max.	Amps, Max.	Fuse Class	240 V Max.	480 V Max.	600 V Max.
KSS	30	100kA	—	300	J	22kA	22kA	10kA
		200kA	35kA	200	J			
		35kA	35kA	200	RK1			
	70 104 150	200kA	35kA	200	J	150kA	85kA	25kA
		35kA	35kA	200	RK1			
	200	200kA	—	200	J	200kA	85kA	14kA
	230 (480V)	100kA	—	300	J			
	230 (600V) 260	200kA	200kA	600	J	200kA	200kA	42kA
				800	L			
	400 600	200kA	200kA	600	J	65kA	50kA	42kA
				800	L			
	800- 1200	200kA	200kA	1600	L	65kA	65kA	65kA

Ratings with Specific Manufacturers' Circuit Breakers

The following charts list power switching device withstand and close-on ratings (WCR) in RMS symmetrical amperes for specific manufacturers' circuit breakers. Circuit breakers are supplied by the customer.

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers		
				Manufacturer	Type or Class	Max. Size, amps
KSS	30	22,000	480	GE	THED	40
	70	150,000	240	Square D	HR	250
		125,000			HL	150
		100,000			BJ, HJ	125
		65,000			BG, HG	125
		42,000			QG, QJ	90
		25,000			HD	150
		25,000			BD	125
		22,000	480	GE	THED	90
		85,000		Square D	HL, HR	150
		50,000			BJ	125
		35,000			HG, HJ	150
					BG	125
		18,000			BD, HD	125
		25,000	600	Square D	HJ, HL, HR	150
					BJ	125
		18,000			HG	150
					BG	125
		14,000			HD	150
					BD	125

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers		
				Manufacturer	Type or Class	Max. Size, amps
KSS	104	150,000	240	Square D	HR	250
		125,000			HL	150
		100,000			BJ, HJ	125
		65,000			BG, HG	125
		42,000			QG, QJ	125
		25,000			HD	150
					BD	125
		22,000	480	GE	THED	150
		85,000		Square D	HL, HR	150
		50,000			BJ	125
		35,000			HG, HJ	150
					BG	125
		18,000			BD, HD	125
		25,000	600	Square D	HJ, HL, HR	150
					BJ	125
		18,000			HG	150
					BG	125
		14,000			HD	150
					BD	125
KSS	150	150,000	240	Square D	HR	250
		125,000			HL	150
		100,000			BJ, HJ	125
		65,000			JG, JJ, JL, JR	200
					BG, HG	125
		42,000			QG, QJ	200
		25,000			HD	150
					BD	125
		22,000	480	GE	THED	150
		85,000		Square D	HL, HR	150
		50,000			BJ	125
		35,000			HG, HJ	150
					BG	125
		25,000			JG, JJ, JL	200
		18,000			BD, HD	125
		25,000	600	Square D	HJ, HL, HR	150
					BJ	125
		18,000			HG	150
					BG	125
		14,000			HD	150
					BD	125
KSS	200 230	200,000	240	Square D	JR	250
		125,000			JL	250
		100,000			JJ	250
		65,000			JG	250
		42,000			QG, QJ	225
		25,000			JD	250
		85,000	480	Square D	JL, JR	250
		30,000			JG, JJ	250
		18,000			JD	250
KSS	230	42,000	600	Eaton/ Cutler Hammer	JGU, JGX, JGH	250
					KDC	400
					LDC, CLDC	600
				GE	TBC4	400
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600
				Square D	HJ, HL, HG	150
					KI, JJ, JL, JR, CF250L	250
					CK400H, CK400HH, CJ400L	400
					LI, MasterPact STR 28D, PK	600
				Siemens/ITE	HJD, CFD6	250
					HHJD6, HHJXD6, CJD6, SCJD6	400
					HHLD6, HHLXD6, CLD6, SCLD6, LNG, LPG, LGC*, LGU*, LGX*	600

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers		
				Manufacturer	Type or Class	Max. Size, amps
KSS	260	65,000	240	GE	THQMV	225
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	600
				Eaton/ Cutler Hammer	LDC, CLDC, HLD, CHLD	600
				Siemens/ITE	HLD6, HLXD6	600
				Square D	QG, QJ	250
					LJ, LL, LR	600
		50,000	480	Eaton/ Cutler Hammer	HFDE, FDCE, HFD, FDC, LHH	225
					JDC, JGH, JGC, JGU, JGX	250
					HKD, HKDB, CHKD, CHKDB, KDC	400
					HLD,CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*, NHH	600
					MDL, CMDL, HMDL, CHMDL, NGS, NGH, NGC, MDLB, CMDLB, HMDLB, CHMDLB	800
				GE	SFL, SFP, FEN, FEH	250
					TBC4	400
					TBC6, TJL4V, TJL1S- 6S, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGN, FGH, FGL, FGP	600
					TBC8, TKL4V, TKH8S- 12S, TKL8S- 12S, SKH8, SKL8, SKP8, TB8	800
				Siemens/ITE	HFD6, HFXD6, HHFD6, HHFXD6, CFD6, HFG, LFG	250
					HJD6, HJXD6, SHJD6, HHJD6, HHJXD6, CJD6, SCJD6, HJG, LJG, LLG	400
					HLD6, HLXD6, SHLD6, HHLD6, HHLXD6, CLD6, SCLD6, HLG	600
					LMD, LMD6, LMXD, LMXD6, HLMD, HLMD6, HLMXD, HLMXD6, MD, MD6, MXD6, HMG, HMD6, HMXD6, SMD6, SHMD6, CMD6, SCMD6, LMG, MG	800
				Square D	KI, KC, CF250L, NSF250	250
					CK400N, CK400NN, CK400H, CK400HH, CJ400L, NSJ400	400
					LC, DJ, DL, LJ, LL, LR, LI, NSJ600	600
					CK800N, CK800NN, CK800H, CK800HH, MasterPact STR 28D, MJ, PK, PJ, PL	800
					CK1000HL	1000
					CK1200NN, CK1200HH	1200
		65,000		Square D	JJ (Current Limiting)	250
		100,000			JL (Current Limiting)	250
		200,000			JR (Current Limiting)	250
		42,000	600	Eaton/ Cutler Hammer	JGU, JGX	250
					KDC	400
					LDC, CLDC	600
				GE	TBC4	400
					TBC6, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600
					TBC8, TKL4V, TKL8S- 12S, SKL8, SKP8	800
				Siemens/ITE	HJD, CFD6	250
					HHJD6, HHJXD6, CJD6, SCJD6	400
					HHLD6, HHLXD6, CLD6, SCLD6	600
					HLMD6, HLMXD6, HMXD6, SHMD6, HMD6, CMD6, SCMD6, LMG, LNG, LPG, LGC*, LGU*, LGX*	800
				Square D	KI, JL, JR, JJ, CF250L	250
					CK400H, CK400HH, CJ400L	400
					LI	600
					CK800H, CK800HH, MasterPact STR 28D, PK	800

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers		
				Manufacturer	Type or Class	Max. Size, amps
KSS	400	65,000	240	GE	THQMV	225
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	600
				Eaton/ Cutler Hammer	LDC, CLDC, HLD, CHLD	600
				Siemens/ITE	HLD6, HLXD6	600
				Square D	QG, QJ	250
					LJ, LL, LR	600
		50,000	480	Eaton/ Cutler Hammer	JGH, JGC, NHH	250
					HKD, CHKD, KDC, HKDB, CHKDB, LHH	400
					CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*	600
					MDL, CMDL, HMDL, CHMDL, NGS, NGH, NGC, MDLB, CMDLB, HMDLB, CHMDLB	800
					NGU	1600
				GE	TBC4	400
					TBC6, TJL4V, TJL1S-6S, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGN, FGH, FGL, FGP	600
					TBC8, TKL4V, TKH8S-12S, TKL8S-12S, SKH8, SKL8, SKP8, TB8	800
				Siemens/ITE	HFD6, HFXD6, HFG, LFG	250
					HJD6, HJXD6, SHJD6, HHJD6, HHJXD6, CJD6, SCJD6, HJG, LLG, LJG	400
					HLD6, HLXD6, SHLD6, HHLD6, HHLXD6, CLD6, SCLD6, HLG	600
					LMD6, LMXD6, HLMD6, HLMXD6, MD6, MXD6, HMD6, HMXD6, SMD6, SHMD6, CMD6, SCMD6, HMG, LMG	800
				Square D	CK400N, CK400NN, CK400H, CK400HH, CJ400L, NSJ400	400
					LC, DJ, DL, LJ, LL, LR, LI, NSJ600	600
					CK800N, CK800NN, CK800H, CK800HH, MJ	800
					CK1000HH	1000
					PK, PJ, PL, MH, MasterPact STR 28D, CK1200HH	1200
		42,000	600	Eaton/ Cutler Hammer	KDC	400
					LDC, CLDC, LGC*, LGU*, LGX*	600
				GE	TBC4	400
					TBC6, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600
					TBC8, TKL4V, TKL8S-12S, SKL8, SKP8	800
				Siemens/ITE	HHJD6, HHJXD6, CJD6, SCJD6	400
					HHLD6, HHLXD6, CLD6, SCLD6	600
					HLMD6, HLMXD6, HMXD6, SHMD6, HMD6, CMD6, SCMD6, LMG	800
					LNG, LPG	1200
				Square D	CK400H, CK400HH, CJ400L	400
					LI	600
					CK800H, CK800HH	800
					MasterPact STR 28D, PK	1200

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

Model	Switch Rating, amps	WCR, amps RMS	Volts, Max.	Molded-Case Circuit Breakers		
				Manufacturer	Type or Class	Max. Size, amps
KSS	600	65,000	240	GE	THQMV	225
					SGL1, SGL4, SGL6, SGP1, SGP4, SGP6	600
				Eaton/ Cutler Hammer	LDC, CLDC, HLD, CHLD	600
				Siemens/ITE	HLD6, HLXD6	600
				Square D	QG, QJ	250
					LJ, LL, LR	600
		50,000	480	Eaton/ Cutler Hammer	JGH, JGC, HFG, LFG	250
					HLD, CHLD, LDC, CLDC, LGH*, LGC*, LGU*, LGX*	600
					MDL, CMDL, HMDL, CHMDL, NGS, NGH, NGC, NGU, MDLB, CMDLB, NF	800
				GE	TBC6, TJL4V, TJL1S-6S, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGN, FGH, FGL, FGP	600
					TBC8, TKL4V, TKH8S-12S, TKL8S-12S, SKH8, SKL8, SKP8, TB8	800
					SKL12, SK12P	1200
				Siemens/ITE	HLD6, HLXD6, SHLD6, HHLD6, HHLXD6, CLD6, SCLD6, HLG, LLG	600
					LMD6, LMXD6, HLMD6, HLMXD6, MD6, MXD6, HMD6, HMXD6, SMD6, SHMD6, CMD6, SCMD6, HMG, LMG	800
					HND6, HNXD6, SND6, SHND6, ND6, NXD6, HNG, LNG, CND6	1200
				Square D	LC, DJ, DL, LI, NSJ600	600
					CK800N, CK800NN, MJ	800
					MH, CK1200N, CK1200NN, CK1200H, CK1200HH, NT-H, NT-L1, NT-L, NT-LF, PK, PJ, PL	1200
					CM2000HH	2000
					CM2500HH	2500
		42,000	600	Eaton/ Cutler Hammer	JGC	250
					TBC4	400
					LDC, CLDC	600
				GE	TBC6, SGL1, SGL4, SGL6, SGP1, SGP4, SGP6, FGP	600
					TBC8, TKL4V, TKL8S-12S, SKL8, SKP8	800
					SKL12, SKP12	1200
				Siemens/ITE	HHLD6, HHLXD6, CLD6, SCLD6	600
					HLMD6, HLMXD6, HMXD6, SHMD6, HMD6, CMD6, SCMD6, LMG	800
					HND6, HNXD6, HNG, LNG, SHND6	1200
				Square D	LI	600
					CK800H, CK800HH	800
					CK1000HL	1000
					CK1200H, CK1200HH, NT-H, NT-L, NT-LF, NT-L1, MasterPact STR 28D, PK	1200
	800 1000 1200	65,000	480	Eaton/ Cutler Hammer	HLD, CHLD, LGH, LGC, LGU, LGX, LDC, CLDC	600
					HMDL, CHMDL, HMDLB, CHMDLB	800
					HND, CHND, NDC, CNDC, NF	1200
					NGH, NGC, NGU	1600
					RGH, RGC	2500
				GE	TBC6, TJL4V, SGL, SGP6	600
					TBC8, SKL8, SKP8	800
					SKL12, SKP12, TKL4V	1200
				Siemens/ITE	HLXD6, HHLXD6, HHLD6, CLD6, SHLD6, SCLD6, HLG, LLG	600
					HMXD6, HMD6, SHMD6, HMG, LMG, CMD6, SCMD6	800
					SHND6, CND6, HNXD6, HNG, LNG	1200
					HPG, LPG, HPD, HPD6, CPD6, HPXD, HPXD6, SHPD, SHPD6	1600
					HRD6, HRXD6	2000
				Square D	LI, LE LSI, LE LI, LX, LXI, LJ, LL, LR	600
					MJ, ME, MX, CK800H, CK800HH	800
					CK1000HL	1000
					NT-L1, NT-L, NT-LF, NE, NX, CK1200H, CK1200HH, PJ, PL	1200
					NW, RJ, RL	1600
					PE, PX	2500
					SES, SE, SEH (LS or LSI TRIP)	3000
					SE (LI, LSI-E, and LI-E TRIP)	4000
					MasterPact STR 28D	6300
			600	Eaton/ Cutler Hammer	Tri-Pac NB	800
					RDC	2500
				Siemens/ITE	CND	1200

* With Digitrip 310+ LS or LSG Inst. Override set to 12X.

Controller Accessories

See the controller specification sheets for more information.

❑ Accessory Modules

- Alarm Module
- External Battery Supply Module
- Input/Output Module
- High-Power Input/Output Module

❑ Controller Disconnect Switch

❑ Ethernet Communications

❑ Current Sensing Kit

❑ Padlockable User Interface Cover

❑ Supervised Transfer Control Switch

Transfer Switch Accessories

Accessories are available either factory-installed or as loose kits, unless otherwise noted.

❑ CSA Certification

❑ Digital Meter

- Measure and display voltage, current, frequency, and power
- 35 programmable alarms
- LCD display, 67 x 62.5 mm (2.65 x 2.5 in.)
- Pushbutton operation
- Password- protected programming menus
- Two digital inputs
- Two digital outputs
- Two Form A relay outputs
- Serial port for optional network connections
- Data logging
- Factory- installed

❑ Engine Start Circuit Monitor

See Specification Sheet G6- 165.

❑ Export Packaging

- 10-year major components

❑ Extended Limited Warranties

- 2-year basic
- 5-year basic
- 5-year comprehensive

❑ Heater, Anti-Condensation

- Hygrostat-controlled 120 VAC strip heater (customer-supplied voltage source required)
- 100 or 250 watts (sized for enclosure)
- Protective 15 Amp circuit breaker

❑ Literature Kits

- Production literature kit (one set of literature is included with each transfer switch)
- Overhaul literature kit

■ RSA III Remote Serial Annunciator

- Monitors the generator set
- Monitors Normal and Emergency source status and connection
- Monitors ATS common alarm
- Allows remote testing of the ATS
- For more information, see specification sheet G6- 139.

❑ Surge Protection Device (SPD)

- SPD available for the normal source supply
- Surge protection reduces transient voltages to harmless levels
- Protection modes: L-L / L-N / L-G / N-G
- Replaceable phase and neutral cartridges for service
- Frequency: 50- 60 Hz
- Operating Temperature Range: - 40 to 176°F (- 40 to 80°C)
- Remote contacts for customer-supplied status indicators:
  Contacts: 1 NO, 1 NC
  Min Load: 12VDC / 10 mA
  Max. Load: 250 VAC / 1 A
  Wire Size (max.): 16AWG
- Fuse protection: 30 amps / 600 V
- UL 1449, 3rd Edition for Type 2 applications
- IEC 61-643-1, 2nd Edition T2/11
- See additional SPD specifications below

Seismic Certification

❑ IBC Seismic Certification

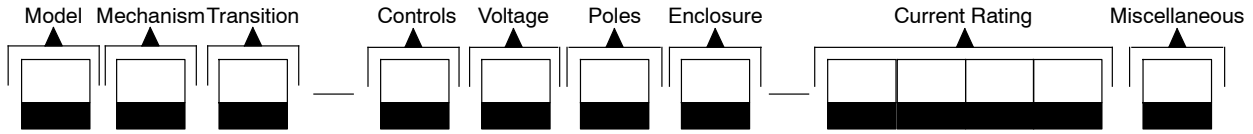
- Certification depends on application and geographic location. Contact your distributor for details.
- Available for all KSS enclosures.

SPD Specifications

Nominal Voltage (V ±15%)	Max. Discharge Current (kA)	Phase	Poles	UL VPR 3rd Ed (L-N/N-G/L-G) (kV)	Limiting Voltage, (L-N/N-G/L-G) (kV)		Short Circuit Withstand Current (kA)	Maximum Continuous Operating Voltage (VAC)
					at 3kAmps	at 10kAmp		
240/120	40	Split	3	0.6 / 1.2 / 0.7	0.6 / 0.4 / 0.6	0.8 / 0.7 / 0.8	200	175 / 350
208/120	40	Wye	4	0.6 / 1.2 / 0.7	0.6 / 0.4 / 0.6	0.8 / 0.7 / 0.8	200	175 / 350
480/277	40	Wye	4	1.0 / 1.2 / 1.1	1.0 / 0.4 / 1.0	1.2 / 0.7 / 1.2	200	320 / 640
240/120	40	HLD	4	1.0 / 1.2 / 1.1	1.0 / 0.4 / 1.0	1.2 / 0.7 / 1.2	200	320 / 640
600/347	40	Wye	4	1.3 / 1.2 / 1.4	1.3 / 0.4 / 1.3	1.5 / 0.7 / 1.5	200	440 / 880

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

Model Designation



Record the transfer switch model designation in the boxes. The transfer switch model designation defines characteristics and ratings as explained below.

Sample Model Designation: KSS-AMTA-0400S

Model

K: Kohler

Mechanism

S: Standard (Specific Breaker)

Transition

S: Standard

Controller

A: Decision-Maker® MPAC 1200, Automatic

B: Decision-Maker® MPAC 1200, Non-Automatic

Voltage/Frequency

C:	208 Volts/60 Hz	K:	440 Volts/60 Hz
D:	220 Volts/50 Hz	M:	480 Volts/60 Hz
F:	240 Volts/60 Hz	N:	600 Volts/60 Hz
G:	380 Volts/50 Hz	P:	380 Volts/60 Hz
H:	400 Volts/50 Hz	R:	220 Volts/60 Hz
J:	416 Volts/50 Hz	S:	400 Volts/60 Hz

Number of Poles/Wires

N: 2 Poles/3 Wires, Solid Neutral

T: 3 Poles/4 Wires, Solid Neutral

V: 4 Poles/4 Wires, Switched Neutral

W: 4 Poles/4 Wires, Overlapping Neutral

Enclosure

A:	NEMA 1	D:	NEMA 4
B:	NEMA 12	F:	NEMA 4X
C:	NEMA 3R	G:	Open Unit

Current, Amps

0030	0200	0600
0070	0230	0800
0104	0260	1000
0150	0400	1200

Connections

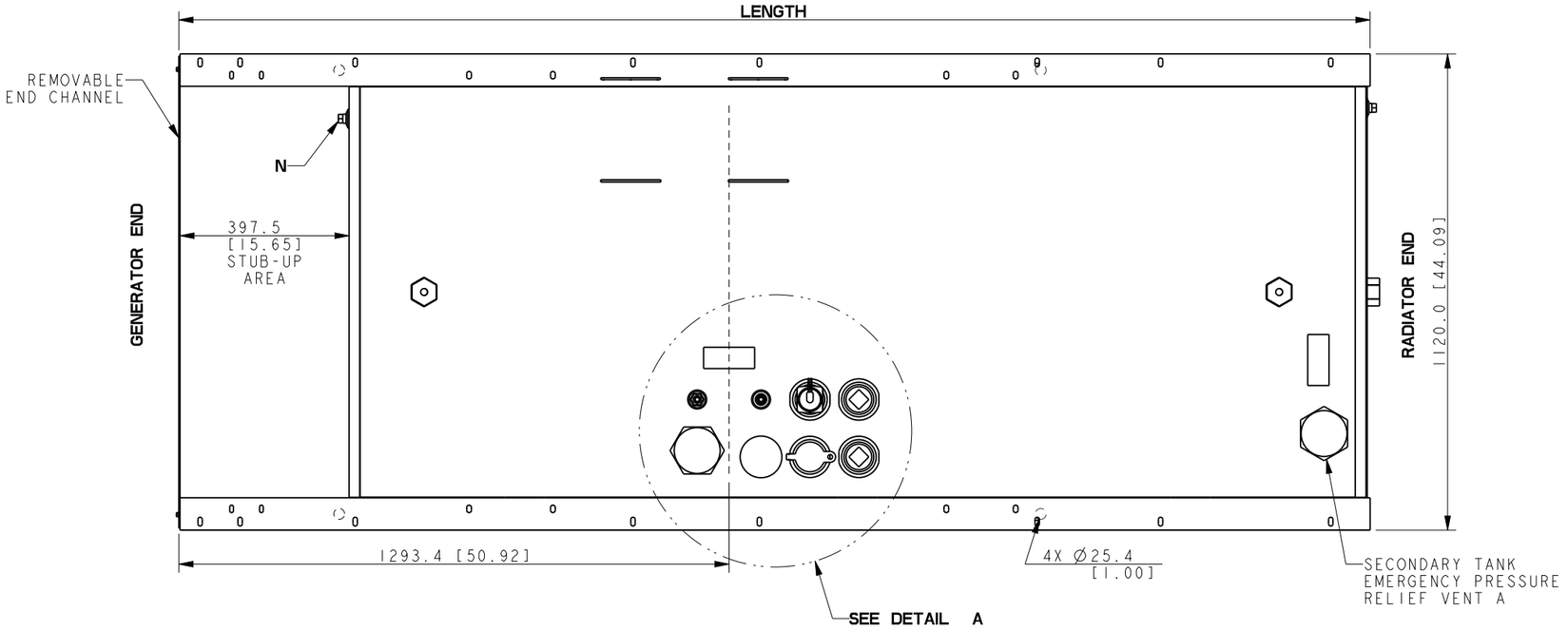
S: Standard

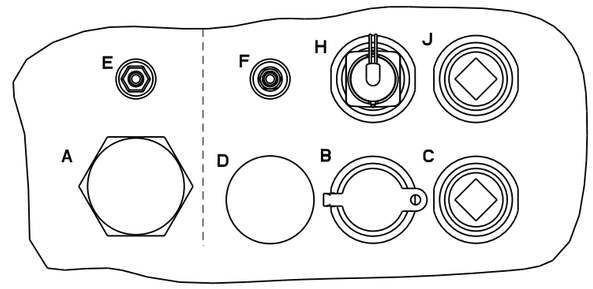
Note: Some selections are not available for every model. Contact your Kohler distributor for availability.

DISTRIBUTED BY:

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® Power Systems distributor for availability.

MODEL	CAPACITY		WEIGHT		HEIGHT		LENGTH		E-VENT,"A"	
	LTR	GAL	KG	LBS	MM	IN	MM	IN	SIZE (IN)	QTY
80/100kW	791	209	366	807	508	20	2800	110.2	3"	2
80 kW	1371	348	482	1062	813	32	2800	110.2	3"/4"	1 EACH
100 kW	1698	448	560	1234	813	32	3400	133.9	4"	2



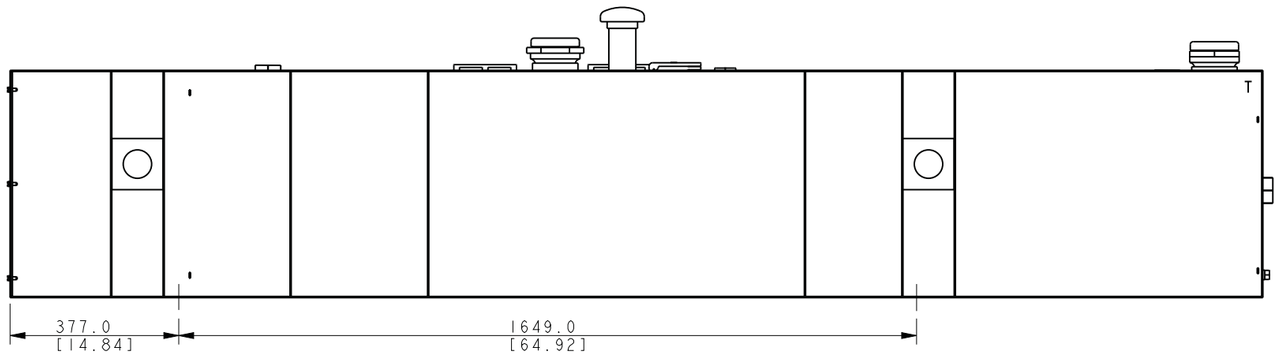


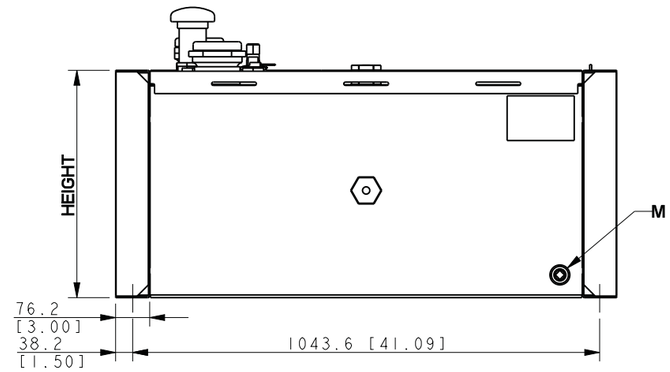
DETAIL A
SCALE 0.30

TANK FITTINGS

A. 'A' NPT EMERGENCY VENT FITTING PER NFPA 30 WITH VENT CAPS
B. 2" NPT FUEL FILL FITTING WITH LOCKABLE CAP & 2" RISER
C. 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" NPT PIPE PLUG)
D. 2" NORMAL VENT FITTING WITH MUSHROOM VENT CAP AND 5" RISER
E. 2" NPT FITTING FOR REMOVABLE ENGINE SUPPLY DIP TUBE (3/8" NPT FEMALE WITH CHECK VALVE)
F. 2" NPT FITTING FOR REMOVABLE FUEL RETURN DIP TUBE (3/8" NPT FEMALE)
H. 2" NPT FUEL LEVEL SENDING UNIT
J. 2" NPT ADDITIONAL FITTING FOR OPTIONAL ACCESSORY (INSTALL STEEL 2" NPT PIPE PLUG)
M. 1/2" NPT BASIN DRAIN (INSTALL STEEL 1/2" NPT PIPE PLUG)
N. 1/2" NPT FOR FUEL IN BASIN SWITCH (INSTALL STEEL 1/2" NPT PIPE PLUG)

* FITTING DESIGNATIONS TO CHANGE WITHOUT NOTIFICATION





STANDARD TANK

80 MODEL 4S7, 4S9, 4V9
100 MODEL 4S9, 4S11, 4V11
RECONNECTABLE
IMPROVE MOTOR STARTING (IM5) RECONNECTABLE
600V & 1 PHASE ALTERNATORS
4045HF285 JOHN DEERE, TIER III

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	9-20-12	NEW DRAWING [CT23454]	KMP
A	5-23-13	(D-8) 348 GAL TANK: VENT SIZE 3"/4" (1 EACH)	
		WAS 3" (2) [CT47790]	PKD

UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN MILLIMETERS
2) TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

APPROVALS		DATE
DRAWN	KMP	9-20-12
CHECKED	JB2	9-20-12
APPROVED	AJD	9-20-12

KOHLER CO. METRIC | PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.

TITLE: **DIMENSION PRINT**

SCALE 0.15 | CAD NO. | SHEET 1 of 1
DWG NO. **ADV-8519** | **D**

SECTION 32 3125

PRIVACY WOOD FENCES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Privacy wood fences.
   2. Privacy wood gates
   3. Excavation for posts.
   4. Concrete post foundations.

B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.
   2. Section 03 3000 - Cast-In-Place Concrete for post foundations.

1.2 REFERENCES

A. ASTM International (ASTM):
   1. C94 - Standard Specification for Ready-Mixed Concrete.
   2. D143-94(2000) - Standard Test Methods for Small Clear Specimens of Timber.
   3. D198-05 - Standard Test Methods of Static Tests of Lumber in Structural Sizes.
   4. D1761-06 - Standard Test Methods for Mechanical Fasteners in Wood.
   5. D2394-05 - Standard Methods for Simulated Service Testing of Wood
   6. D2395-06 - Standard Test Methods for Specific Gravity of Wood and Wood-Based Materials.
   7. E84-07 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. American Wood Preservers Association (AWPA) E1-06 - Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites.

1.3 SYSTEM DESCRIPTION

A. Design Requirements: Design fence system to withstand 70 MPH steady wind and 90 MPH gusting wind tests.

1.4 SUBMITTALS

A. Submittals for Review:
   1. Product Data: Indicate sizes, profiles, surface finishes, and performance characteristics.

B. Closeout Submittals:
   1. Maintenance Data: Manufacturer’s instructions on care and cleaning of composite wood products.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle composite wood in accordance with manufacturer’s instructions.

B. Store wood level and flat, off ground or floor, with supports at each end and maximum 24 inches on center.

C. Cover wood with waterproof covering, vented to prevent moisture buildup.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Fence System: Seclusions Privacy Fence System, Shadow Box Design
   1. Fence height: 8 feet.
   2. Components:
      a. 1 x 6 (dog ear) cedar fence pickets space at 3” max.
      b. Top, middle and bottom rails.
      c. 8’-0” high above slab level galvanized tubing fence posts. Note that (4) corner posts shall be 10-0” high above slab level for installation of (4) light fixtures, Ref: Electrical.
      d. Post caps.
      e. Support brackets.
      f. 6’-0” high above slab level, single 5’-0” wide swinging gate.

2.2 ACCESSORIES

A. Fasteners: Galvanized or corrosion-resistant coated steel.
B. Concrete: Specified in Section 03 3000

C. Gravel: Crushed stone or river gravel.

D. Gate Hardware:
   1. Three hinges per gate leaf, sized to gate weight and conditions.
   2. Latching mechanism with padlock provisions.
   3. Install reinforcing straps or structure to stabilize oversized width gate.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install fences in accordance with manufacturer’s instructions.

B. Cut and drill composite wood using carbide tipped blades.

C. Space posts maximum 8 feet on center.

D. Drill post holes into undisturbed or compacted soil; excavate deeper in soft or loose soils and for posts with heavy lateral loads.

E. Drill posts to 12” diameter. Locate bottom of post 36” below grade. Extend bottom of hole 6” deeper than bottom of post.

F. Place 6” of gravel in bottom of hole; tamp to compact.

G. Place concrete around posts in continuous pour, tamp and dome top away from post. Check for vertical and top alignment; brace posts until concrete has set.

H. Place top of concrete below finished grade.

I. Position support brackets using assembly tool. Screw to posts with four 2-1/2” long drive screws.

J. Cut top, middle and bottom rails to required lengths.

K. Position bottom rail and screw attach to bottom brackets with self-tapping screws.

L. Insert pickets into bottom rail, interlocking adjacent pieces.

M. Position top rail and screw attach to top brackets with self-tapping screws.

Refer to the below visual depiction of a shadow box fence panel layout.

END OF SECTION