To: Prospective Bidders

From: Wold Architects and Engineers

Date: March 10, 2022

Comm. No: 216054

Subject: Addendum No. 1 for Bidding Documents for the
Lift Station Generator Enclosure
Wrangell, Alaska

BIDS DUE MARCH 30, 2022 AT 2:00 P.M.

This addendum forms a part of the Contract Documents dated January 24, 2022. Acknowledge receipt of this Addendum on the space provided on the Bid Form. Failure to do so may result in disqualification of Bid.

This Addendum consists of three (3) typed sheets and attachments:
Specifications: 00 01 10, 00 03 00, 00 10 00, 00 30 00, 00 31 10, 00 32 00, 00 33 00, 00 36 00, 00 50 00, 00 70 00, 08 80 00, 08 83 00, 08 25 20, 07 21 00, 07 46 46, 26 05 73.01, 26 27 01, 26 32 13, 26 36 00
Drawings: A2.00b, A5.201, S1.0, S2.0, S3.0, E0.00, E8.00, E8.01
For Reference Only: Wrangell Lift Station Technical Submittal Data – Caterpillar C4.4 LCABR D40-LC2, Site Photo Appendix

PROJECT MANUAL

1. SPECIFICATION SECTION 00 01 10 TABLE OF CONTENTS
   A. Reissued this addendum.
2. SPECIFICATION SECTION 00 03 00 NOTICE INVITING BIDS
   A. Reissued this addendum.
3. SPECIFICATION SECTION 00 10 00 INSTRUCTIONS TO BIDDERS
   A. Reissued this addendum.
4. SPECIFICATION SECTION 00 30 00 BID
   A. Reissued this addendum.
5. SPECIFICATION SECTION 00 31 10 BID SCHEDULE
   A. Reissued in its entirety this addendum.
6. SPECIFICATION SECTION 00 32 00 BID BOND
   A. Reissued this addendum.
7. SPECIFICATION SECTION 00 33 00 MODIFIED BID SCHEDULE
   A. Reissued in its entirety this addendum.

8. **SPECIFICATION SECTION 00 36 00 SUBCONTRACTOR REPORT**
   A. Reissued this addendum.
9. **SPECIFICATION SECTION 00 50 00 AGREEMENT**
   A. Reissued this addendum.
10. **SPECIFICATION SECTION 00 61 00 PERFORMANCE BOND**
   A. Reissued this addendum.
11. **SPECIFICATION SECTION 00 62 00 PAYMENT BOND**
   A. Reissued this addendum.
12. **SPECIFICATION SECTION 00 70 00 GENERAL CONDITIONS**
   A. Reissued this addendum.
13. **SPECIFICATION SECTION 00 80 00 SUPPLEMENTARY GENERAL CONDITIONS**
   A. Reissued this addendum.
14. **SPECIFICATION SECTION 00 83 00 ALASKA LABOR STANDARDS, REPORTING, AND PREVAILING WAGE RATE DETERMINATION**
   A. Reissued this addendum.
15. **SPECIFICATION SECTION 00 85 20 PERMITS**
   A. Reissued this addendum.
16. **SPECIFICATION SECTION 07 21 00 INSULATION**
   A. Issued this addendum.
17. **SPECIFICATION SECTION 07 46 46 FIBER-CEMENT SIDING**
   A. Reissued this addendum.
18. **SPECIFICATION SECTION 26 05 73.01 FAULT CURRENT AND ARC FLASH STUDY**
   A. Issued this addendum.
19. **SPECIFICATION SECTION 26 27 01 ELECTRICAL UTILITY COORDINATION**
   A. Reissued this addendum.
20. **SPECIFICATION SECTION 26 32 13 ENGINE GENERATORS**
   A. Reissued this addendum.
21. **SPECIFICATION SECTION 26 36 00 TRANSFER SWITCHES**
   A. Reissued this addendum.

DRAWINGS

1. **DRAWING A2.00b MAIN LEVEL DEMOLITION PLAN, FLOOR PLAN & ELEVATIONS**
   A. Reissued this addendum.
2. **DRAWING A5.201 WALL SECTIONS, TYPES AND DETAILS**
   A. Reissued this addendum.
3. **DRAWING S1.0 GENERAL NOTES AND SPECIAL INSTRUCTIONS**
   A. Reissued this addendum.
4. **DRAWING S2.0 FOUNDATION PLAN AND ROOF FRAMING PLAN**
   A. Reissued this addendum.

5. DRAWING S3.0 TYPICAL DETAILS AND SECTIONS

A. Reissued this addendum.

6. DRAWING E0.00 ELECTRICAL TITLE SHEET

A. Reissued this addendum.

7. DRAWING E8.00 ELECTRICAL PLANS AND RISER DIAGRAM

A. Reissued this addendum.

8. DRAWING E8.01 ELECTRICAL DETAILS

A. Reissued this addendum.

FOR REFERENCE ONLY

1. WRANGELL LIFT STATION TECHNICAL SUBMITTAL DATA – CATERPILLAR C4.4 LCABR D40-LC2

A. Issued this addendum.

2. SITE PHOTO APPENDIX

A. Issued this addendum.

END OF ADDENDUM #1

SECTION 00 01 10

PROJECT MANUAL TABLE OF CONTENTS

OBTAINING CONTRACT DOCUMENTS. The Contract Documents are entitled:

Lift Station Generator Enclosure
Wood Street
Wrangell, Alaska 99929

Notice is hereby given that the City and Borough of Wrangell, Alaska will receive sealed bids for the construction of **Lift Station Generator Enclosure.**

The Contract Documents may be downloaded free of charge on the City & Borough of Wrangell website (***www.wrangell.com***) under the Bids and RFPs section. Downloading Contract Documents from the City & Borough of Wrangell's website requires registration with the Borough Clerk to be placed on the Plan Holders List and to ensure receipt of subsequent Addenda. Failure to register may adversely affect your proposal. It is the Offeror's responsibility to ensure that they have received all Addenda affecting this Solicitation. To be registered, contact the Borough Clerk at 907-874-2381; Borough Clerks Office, 205 Brueger Street, Wrangell, Alaska 99929; or at clerk@wrangell.com.

DESCRIPTION OF WORK. WORK consists of all activities necessary to construct Lift Station Generator Enclosure and install ER Generator.

SITE OF WORK. The WORK is located at Wood Street in Wrangell, Alaska.

COMPLETION OF WORK. The OWNER will open the work site to the CONTRACTOR immediately following the Notice to Proceed. Substantial completion must be reached by September 30, 2022.

BIDDING, CONTRACT, or TECHNICAL QUESTIONS. All communications relative to this WORK, prior to opening Bids, shall be directed to the following:

Amber Al-Haddad
Capital Facilities Director
Telephone: (907) 874-3902
Email: aal-haddad@wrangell.com

BID SECURITY. Each bid shall be accompanied by a bid bond, cashier's check or certified check made payable to the City and Borough of Wrangell in the amount of five percent (5%) of the total bid price. This serves as a guarantee that the Bidder, if its Bid is accepted, will promptly execute the Agreement. A Bid shall not be considered unless one of the forms of Bidder's security is enclosed with it.

RECEIPT OF BIDS. Sealed bids will be received by the City and Borough of Wrangell, Post Office Box 531, Wrangell, Alaska 99929, located at the Borough Clerk's Office, 205 Brueger Street, Wrangell, Alaska 99929, until 2:00 PM prevailing time on March 30, 2022, at which time they shall be opened and read aloud. Opening date and time may be changed to a later date or time via Addendum. Clearly mark on the outside of the envelope **"Sealed Bid for Lift Station Generator Enclosure"**.

SUBCONTRACTORS. The apparent low Bidder is required to complete and submit the following documentation within five (5) calendar days following the posting of bids by the City and Borough of Wrangell:

- Section 00360 - Subcontractor Report.

CONTRACTOR'S LICENSE. All contractors are required to have a current Alaska Contractor's License, prior to submitting a Bid, and a current Alaska Business License prior to award of the bid.

BID TO REMAIN OPEN. The Bidder shall guarantee the Bid for a period of 60 Days from the date of Bid opening. Any component of the Bid including additive alternates may be awarded anytime during the 60 Days.

OWNER'S RIGHTS RESERVED. The OWNER reserves the right to reject any or all Bids, to waive any informality in a Bid, and to make award to the lowest responsive, responsible Bidder as it may best serve the interests of the OWNER.

OWNER: The City and Borough of Wrangell

By: _____ _____

Jeff Good, Borough Manager Date

END OF SECTION

1.0 DEFINED TERMS. Terms used in these "Instructions to Bidders" and the "Notice Inviting Bids" which are defined in the General Conditions have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to the OWNER, as distinct from a sub-bidder, who submits a Bid to a Bidder.

2.0 INTERPRETATIONS AND ADDENDA.

A. INTERPRETATIONS. All questions about the meaning or intent of the Contract Documents are to be directed to the ENGINEER. Interpretations or clarifications considered necessary by the ENGINEER in response to such questions will be issued by Addendum and emailed to all parties recorded by the OWNER as having received the Contract Documents. Questions received less than 7 Days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect.

B. ADDENDA. Addenda may be issued to modify the Contract Documents as deemed advisable by the OWNER. The OWNER may issue addenda by fax, with a follow-up addendum copy issued by regular mail. Addenda may be emailed less than 7 Days prior to the anticipated Bid opening. The OWNER will make reasonable attempts to provide addenda; however, it is strongly recommended by the OWNER that Bidders independently confirm the contents, number, and dates of each Addenda prior to submitting a Bid. All Bidders who submit a bid shall be deemed to have received and reviewed all addenda.

3.0 FAIR COMPETITION. More than one Bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the OWNER believes that any Bidder is interested in more than one Bid for the WORK contemplated, all Bids in which such Bidder is interested will be rejected. If the OWNER believes that collusion exists among the Bidders, all Bids will be rejected.

4.0 RESPONSIBLE BIDDER. Only responsive Bids from responsible Bidders will be considered. A Bid submitted by a Bidder determined to be not responsible may be rejected. A responsible Bidder is one who is considered to be capable of performing the WORK.

A. The general standards for responsibility are to determine the CONTRACTOR's ability to perform WORK adequately, considering the CONTRACTOR's

1. Financial Resources
2. Ability to Meet Delivery Standards
3. Past Performance Record
    a. References from others on CONTRACTOR's performance
    b. Record of performance on prior OWNER contracts
4. Record of Integrity
5. Obligations to OWNER
    a. Bidders must be registered as required by law and in good standing for all amounts owed to the OWNER within 5 Days of OWNER's Notice of Intent to Award.

B. Special standards for responsibility, if applicable, will be specified. These special standards establish minimum standards or experience required for a responsible Bidder on a specific contract.

C. Before a Bid is considered for award, a Bidder may be requested to submit information documenting its ability and competency to perform the WORK, according to general standards of responsibility and any special standards which may apply. It is Bidder's responsibility to submit sufficient, relevant, and adequate information. OWNER will make its determination of responsibility and has no obligation to request clarification or supplementary information.

5.0 RESPONSIVE BIDS. Only responsive Bids will be considered. Bids may be considered non-responsive and may be rejected. Some of the reasons a Bid may be rejected for being non-responsive are:

A. If the Bid is on a form other than that furnished by the OWNER, or legible copies thereof; or if the form is altered or any part thereof is detached; or if the Bid is improperly signed.

B. If there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the proposal incomplete, indefinite, or ambiguous as to its meaning.

C. If the Bidder adds any unauthorized conditions, limitations, or provisions reserving the right to accept or reject any award, or to enter into a contract pursuant to an award. This does not exclude a Bid limiting the maximum gross amount of awards acceptable to any one Bidder at any one bid opening, provided that any selection of awards will be made by the OWNER.

D. If the Bid does not contain a unit price for each pay item listed, except in the case of authorized alternate pay items.

E. If the Bidder has not acknowledged receipt of each Addendum.

F. If the Bidder fails to furnish an acceptable Bid Guaranty with the Bid.

G. If any of the unit prices bid are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the OWNER.

H. If a bid does not conform to Articles 15.0 and 16.0 of this Section.

6.0 BIDDER'S EXAMINATION OF CONTRACT DOCUMENTS AND SITE. It is the responsibility of each Bidder before submitting a Bid:

A. To examine thoroughly the Contract Documents, and other related data identified in the bidding documents (including "technical data" referred to below):

1. To visit the site to become familiar with and to satisfy the Bidder as to the general and local conditions that may affect cost, progress, or performance of the WORK;

2. To consider federal, state and local laws and regulations that may affect cost, progress, or performance of the WORK;
3. To study and carefully correlate the Bidder's observations with the Contract Documents, and other related data; and
4. To notify the ENGINEER of all conflicts, errors, or discrepancies in or between the Contract Documents and such other related data.

7.0 REFERENCE IS MADE TO THE SUPPLEMENTARY GENERAL CONDITIONS FOR IDENTIFICATION OF:

A. Those reports of explorations and tests of subsurface conditions at the site which have been utilized by the Engineer of Record in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such reports; however, the interpretation of such technical data is the responsibility of the Bidder.

B. Those drawings of physical conditions in or relating to existing surface and subsurface conditions (except underground utilities) which are at, or contiguous to, the site have been utilized by the Engineer of Record in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such drawings; however, the interpretation of such technical data is the responsibility of the Bidder.

C. Copies of such reports and drawings will be made available by the OWNER to any Bidder on request if said reports and drawings are not bound herein. Those reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which the Bidder is entitled to rely, as provided in Paragraph SGC-4.2 of the Supplementary General Conditions, are incorporated herein by reference.

D. Information and data reflected in the Contract Documents with respect to underground utilities at or contiguous to the site is based upon information and data furnished to the OWNER and the Engineer of Record by the owners of such underground utilities or others, and the OWNER and ENGINEER do not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary General Conditions, or in Section 01530 - Protection and Restoration of Existing Facilities.

E. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, underground utilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.2, 4.3, and 4.4 of the General Conditions.

F. Before submitting a Bid, each Bidder will, at its own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and underground utilities) at, or contiguous to, the site or otherwise which may affect cost, progress, or performance of the WORK and which the Bidder deems necessary to determine its Bid for performing the WORK in accordance with the time, price, and other terms and conditions of the Contract Documents.

G. On request in advance, the OWNER will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a

Bid. Bidder shall fill all holes and shall clean up and restore the site to its former condition upon completion of such explorations.

H. The lands upon which the WORK is to be performed, rights-of-way and easements for access thereto and the lands designated for use by the CONTRACTOR in performing the WORK are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by the CONTRACTOR. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by the OWNER unless otherwise provided in the Contract Documents.

I. The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of Article 6, "Bidder's Examination of Contract Documents and Site" herein, that without exception the Bid is premised upon performing the WORK required by the Contract Documents and such means, methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the WORK.

8.0 BID FORM.

A. The Bid shall be made on the Bid Schedule(s) bound herein, or on legible and complete copies thereof, and shall contain the following: Sections 00300 - Bid, 00310 – Bid Schedule, and the required Bid Security. In the event there is more than one Bid Schedule, the Bidder may bid on any individual schedule or on any combination of schedules. The envelope enclosing the sealed Bids shall be plainly marked in the upper left-hand corner with the name and address of the Bidder and shall bear the words "BID FOR," followed by the title of the Contract Documents for the WORK, the name of the OWNER, the address where Bids are to be delivered or mailed to, and the date and hour of opening of Bids. The Bid Security shall be enclosed in the same envelope with the Bid.

B. All blanks on the Bid Form and Bid Schedule(s) must be completed in ink or typed.

C. Bids by corporations shall be executed in the corporate name by the president, a vice-president (or another corporate officer). The corporate address and state of incorporation must appear below the signature.

D. Bids by partnerships must be executed in the partnership name and be signed by a managing partner, and the official address of the partnership must appear below the signature.

E. The Bidder's Bid shall be signed with ink. All names must be printed or typed below the signature.

F. The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form. Failure to acknowledge Addenda shall render Bid non-responsive and shall cause its rejection.

G. The address to which communications regarding the Bid are to be directed must be shown.

H. All Bidders shall provide evidence of authority to conduct business in Alaska to the extent required by law.

I. On Projects including Federal funding, any contractor otherwise qualified to perform the WORK is not required to be licensed nor to submit application for license in advance of submitting a Bid or having such Bid considered; provided, however, that such exemption does not constitute a waiver of the OWNER's right under existing license laws to require a contractor, determined to be a successful Bidder, to be licensed to do business as a contractor in the State of Alaska in connection with the award of a contract to the successful Bidder.

J. A Bid for the WORK will not be accepted from a contractor who does not hold a valid Alaska Business License and a valid Contractor's License in Alaska (applicable to the type of work bid upon) at the time of opening Bids.

9.0 QUANTITIES OF WORK. The quantities of WORK, or material, stated in unit price items of the Bid are supplied only to give an indication of the general scope of the WORK; the OWNER does not expressly or by implication agree that the actual amount of WORK, or material, will correspond therewith, and reserves the right after award to increase or decrease the amount of any unit price item of the WORK by an amount up to and including 25 percent of any Bid item, without a change in the unit price, and shall include the right to delete any Bid item in its entirety, or to add additional Bid items up to and including an aggregate total amount not to exceed 25 percent of the Contract Price (see General Conditions, Article 10 Changes In the Work).

10.0 SUBSTITUTE OR "OR-EQUAL" ITEMS. The procedure for the submittal of substitute or "or-equal" products is specified in Section 01300 - Contractor Submittals.

11.0 SUBMISSION OF BIDS. The Bid shall be delivered by the time and to the place stipulated in the Notice Inviting Bids. It is the Bidder's sole responsibility to see that its Bid is received in proper time. Oral, telegraphic, telephonic or faxed Bids will not be considered.

12.0 BID SECURITY, BONDS, AND INSURANCE. Each Bid shall be accompanied by a certified, or cashier's check, or approved Bid Bond in an amount of at least 5 percent of the total Bid price. The "total Bid price" is the amount of the base bid, plus the amount of alternate bids, if any, which total to the maximum amount for which the contract could be awarded. Said check or Bond shall be made payable to the OWNER and shall be given as a guarantee that the Bidder, if offered the WORK, will enter into an Agreement with the OWNER, and will furnish the necessary insurance certificates, Payment Bond, and Performance Bond; each of said Bonds, if required, and insurance amounts shall be as stated in the Supplementary General Conditions. In case of refusal or failure to enter into said Agreement, the check or Bid Bond, as the case may be, shall be forfeited to the OWNER. If the Bidder elects to furnish a Bid Bond as its Bid security, the Bidder shall use the Bid Bond form bound herein, or one conforming substantially to it in form. Bid Bonds must be accompanied by a legible power of attorney.

13.0 RETURN OF BID SECURITY. Within 14 Days after award of the contract, the OWNER will return the Bid securities accompanying such of the Bids as are not considered in making the award. All other Bid securities will be held until the Agreement has been executed. They will then be returned to the respective Bidders whose Bids they accompanied.

14.0 DISCREPANCIES IN BIDS. In the event there is more than one pay item in a Bid Schedule, the Bidder shall furnish a price for all pay items in the schedule, and failure to do so may render the Bid non-responsive and cause its rejection. In the event there are unit price pay items in a Bid Schedule and the "amount" indicated for a unit price pay item does not equal the product of the unit price and quantity, the unit price shall govern and the amount will be corrected accordingly, and the Bidder shall be bound by said correction. In the event there is more than one pay item in the Bid Schedule and the total indicated for the schedule does not agree with the sum of the prices bid on the individual items, the prices bid on the individual items shall govern and the total for the schedule will be corrected accordingly, and the Bidder shall be bound by the correction.

15.0 BID MODIFICATIONS AND UNAUTHORIZED ALTERNATIVE BIDS.

A. Any Bidder may modify a Bid by mail, email (clerk@wrangell.com), or fax **(Fax: 907-874-3952)** provided that such modification is received by the OWNER prior to the time set for opening of Bids. Bid modifications shall be made using the project Modified Bid Schedule form and shall be used with bid modifications made as a line by line pay item adjustment per the schedule. Bidders are strongly advised to telephone the City & Borough of Wrangell (**Telephone: 907-874-2381)** to confirm the successful and timely transmission of all email and fax Bid modifications.

An email or fax Bid Modification shall not reveal the Bid price but shall provide the addition or subtraction or other modification so that the final prices will not be known by the OWNER until the sealed Bid is opened. Modifications shall include both the modification of the unit bid price and the total modification of each item modified. The OWNER shall not be responsible for its failure to receive fax modifications whether such failure is caused by transmission line problems, fax device problems, operator error or otherwise.

B. Unauthorized conditions, limitations, or provisions attached to the Bid will render it informal and cause its rejection as being non-responsive. The completed bid forms shall be without interlineation, alterations, or erasures in the printed text. All changes shall be initialed by the person signing the Bid. Alternative bids will not be considered unless called for.

16.0 WITHDRAWAL OF BID. The Bid may be withdrawn by the Bidder by means of a written request, signed by the Bidder or its properly authorized representative. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of Bids prior to the scheduled closing time for receipt of Bids.

17.0 AWARD OF CONTRACT.

A. Award of a contract, if it is awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Technical Specifications and will be made to the lowest responsive, responsible Bidder whose Bid complies with all the requirements prescribed. Unless otherwise specified, any such award will be made within the period stated in the Notice Inviting Bids that the Bids are to remain open. Unless otherwise indicated, a single award will be made for all the pay items in an individual Bid Schedule.

B. If the OWNER has elected to advertise this Project with a base bid and additive or deductive alternates, the OWNER may elect to award the contract for the base bid, or the base bid plus one or more alternates selected by the OWNER. In either case, award shall be made to the responsive, responsible Bidder offering the lowest total bid for the WORK to be awarded.

C. Low Bidder will be determined based on the lowest total of the base bid plus combinations of additive alternatives as deemed in the best interest of the OWNER.

D. A Local Bidder Preference shall apply to all City and Borough of Wrangell procurements, except when restricted by state or federal regulations. To be considered a qualifying bidder, bidders shall meet the requirements of the Local Bidder Preference ordinance, according to WMC 5.10.040 (D). The Owner may request documentation to support entries made on this form.

The Wrangell Municipal Code (WMC) Article 5.10.040, Section D. LOCAL BIDDER PREFERENCE AWARD reads:

1. Unless contrary to federal or state law or regulation, or as otherwise provided in section (D)(2) of this section, a contract for, or purchase of, supplies, materials, equipment, contractual services, or public improvements shall be awarded to a local bidder where the bid by such local bidder is in all material respects comparable to the lowest responsible nonlocal bid, and if the amount bid by such local bidder does not exceed the lowest responsible nonlocal bid by more than:

   a. Five percent of the amount bid by the lowest responsible nonlocal bidder if that nonlocal bidder's bid is $1,000,000 or less;

   b. Three percent of the amount bid by the lowest responsible nonlocal bidder if that nonlocal bidder's bid is $1,000,001 or more.

2. This preference shall not be interpreted to mean that the borough is precluded from making the purchase from whatever source is most advantageous to the borough after considering all factors in the public interest even when the price quoted by the local bidder satisfies subsection (D)(1)(a) or (b) of this section.

3. "Local bidder" for purposes of the section shall mean a bidder who:

   a. Holds a current Alaska business license;

   b. Submits a bid for goods or services under the name appearing on the person's current Alaska business license;

   c. Has maintained a place of business within the boundaries of the borough for a period of six months immediately preceding the date of the bid;

   d. Is not delinquent in the payment of any utilities, taxes, charges or assessments owing to the borough on account of that business;

   e. Is incorporated or qualified to do business under the laws of Alaska with its principal place of business in the borough, is a proprietorship and the proprietor is a resident of the borough, or is a partnership and all partners are residents of the City and Borough of Wrangell;

   f. If a joint venture, all joint venture partners must qualify under subsection (D)(3)(a) through (e) of this section;

   g. The manager may require such documentation or verification by the person claiming to be a local bidder as is deemed necessary to establish the requirements of this section.

18.0 EXECUTION OF AGREEMENT.

A. All Bids must be approved by the Wrangell Borough Assembly. After the Assembly has approved the award, the OWNER will issue a Notice of Intent to Award to the approved Bidder following the Bid Opening. The Bidder to whom award is made shall execute a written Agreement with the OWNER on the Agreement form, Section 00500, and shall secure all insurance and furnish all certificates and bonds required by the Contract Documents within 10 Days from the date stated in the Notice of Intent to Award letter.

B. Failure or refusal to enter into the Agreement as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the Bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the second lowest responsive, responsible Bidder. If the second lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the third lowest responsive, responsible Bidder. On the failure or refusal of such second or third lowest Bidder to execute the Agreement, each such Bidder's Bid securities shall be likewise forfeited to the OWNER.

19.0 LIQUIDATED DAMAGES. Provisions for liquidated damages are set forth in the Agreement.

20.0 PERMITS. The CONTRACTOR is responsible for all WORK associated with meeting any local, state, and federal permit requirements.

END OF SECTION

BID TO: CITY & BOROUGH OF WRANGELL

For Project Name: _____

By Company Name: _____

To the Contracting Officer, City and Borough of Wrangell:

1. In compliance with your Invitation to Bid for the above-referenced project, the undersigned proposes to furnish and deliver all the materials and to perform all the work and labor required in the construction of the Project, located in Wrangell, Alaska, according to all of the terms in the plans and specifications and for the amount and prices named herein as indicated on the Bid Schedule which is made a part of this Bid.

2. If this Bid is accepted, the undersigned does hereby agree to enter into an Agreement with the OWNER on the form included in the Contract Documents (as defined in Article 7 of Section 00500 - Agreement) to perform the WORK as specified or indicated in said Contract Documents.

3. This Bid will remain open for the period stated in the "Notice Inviting Bids" unless otherwise required by law. The undersigned will enter into an Agreement within the time and in the manner required in the "Notice Inviting Bids" and the "Instructions to Bidders." The undersigned agrees to commence the work within 10 calendar days, unless otherwise stipulated in the contract, and to complete the work within by the Substantial Completion Date provided in the contract, after the effective date of the Notice to Proceed, unless extended in writing by the Owner.

4. The undersigned will furnish insurance certificates, Payment Bond, Performance Bond, and any other documents as required by the Contract Documents as surety for the full, complete and faithful performance of this contract.

5. Bidder has familiarized itself with the nature and extent of the Contract Documents, WORK, site, locality where the WORK is to be performed, the legal requirements (federal, state and local laws, ordinances, rules, and regulations), and the conditions affecting cost, progress or performance of the WORK and has made such independent investigations as Bidder deems necessary.

6. The Undersigned declares that they have carefully examined the contract requirements and that they have made a personal examination of the site of the work; that they understand that the quantities, where such are specified in the Bid Schedule or on the plans for this project, are approximate only and subject to increase or decrease, and that they are willing to perform increased or decreased quantities of work at unit prices bid under the conditions set forth in the Contract Documents.

7. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

8. To all the foregoing, and including all Bid Schedule and information required of Bidder contained in this Bid Form, said Bidder further agrees to complete the WORK required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept in full payment therefor the Contract Price based on the total bid price(s) named in the Bid Schedule.

9. The undersigned has examined copies of all the Contract Documents and acknowledges receipt of the following addenda to the drawings and/or specifications

Addenda No.	Date Issued	Addenda No.	Date Issued

Give number and date of each Addendum above. Failure to acknowledge receipt of all Addenda will cause the Bid to be non-responsive and shall cause its rejection.

10. The undersigned has read the forgoing and hereby agrees to the conditions stated therein by affixing their signature below.

Dated:	_____	Bidder:	_____ (Company Name)
Contractor's License No.:	_____	By:	_____ (Signature in Ink)
Telephone No.:	_____	Printed Name:	_____
		Title:	_____
Facsimile No.:	_____	Address:	_____ (Street or P.O. Box)
			_____ (City, State, Zip)

11. DOCUMENTS REQUIRED FOR BID. TO BE CONSIDERED, ALL BIDDERS MUST COMPLETE AND INCLUDE THE FOLLOWING AT THE TIME OF THE BID OPENING:

- Bid form, Section 00300
- Bid Schedule, Section 00310
- Bid Security, Section 00320
- Modified Bid Schedule, Section 00330 (any bid revisions must be submitted by the Bidder prior to the bid opening.)

12. REQUIRED AFTER NOTICE OF APPARENT LOW BIDDER. Unless otherwise notified by the OWNER, the apparent low Bidder is required to complete and submit the following document within five (5) working days following notice of apparent low bidder:

- Subcontractor Report, Section 00360

13. REQUIRED FOR AWARD. To be awarded the contract, the successful Bidder must complete and submit, within ten (10) days after the date of the "Notice of Intent to Award" letter, the following executed documents:

- Alaska Business License
- Contractor's License
- Agreement Form, Section 00500
- Performance Bond, Section 00610
- Payment Bond, Section 00620
- Certificates of Contractor Insurance Section 00700 and Section 00800

14. The successful Bidder will be required to submit, within ten Days after the date stated in the "Notice to Proceed" the following executed documents:

- Certificates of Subcontractor Insurance Section 00700 and Section 00800
- One executed copy of each subcontract for WORK that exceeds one half of one percent of the intended contract award amount.

END OF SECTION

SECTION 003100 - BID SCHEDULE

Bidders Please Note: Before preparing this Bid Schedule, carefully read the Invitation for Bids, Instructions to Bidders, and the Technical Specifications.

The Bidder shall insert a unit price opposite each pay item in the Bid Schedule and multiply the unit price by the estimated quantities for this contract. No price is to be tendered for any item not appearing in the Bid Schedule.

In the event there is more than one pay item in the Bid Schedule and the total indicated for the schedule does not agree with the sum of the prices bid on the individual items, the prices bid on the individual items shall govern and the total for the schedule will be corrected accordingly, and the Bidder shall be bound by the correction.

A Local Bidder Preference of five percent (5%) ___X____ will, _____ will not be utilized on this project.

Lift Station Generator Enclosure

Pay Item No.	Pay Item Description	Pay Unit	Approximate Quantity	Unit Price		Total Price	
				Dollars	Cents	Dollars	Cents
1	Lift Station Generator Enclosure	LS	All Req'd				

TOTAL Lift Station Generator Enclosure LUMP SUM AMOUNT IN FIGURES: $_____

TOTAL Lift Station Generator Enclosure LUMP SUM AMOUNT IN WORDS:

_____

BIDDER NAME: _____

BIDDER'S TELEPHONE: _____

BIDDER'S EMAIL ADDRESS: _____

END OF SECTION

SECTION 00320*0* - BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, that_____

_____ as Principal, and _____

as Surety, are held and firmly bound unto the **CITY & BOROUGH OF WRANGELL** hereinafter called "OWNER," in the sum of _____dollars, (not less than five percent (5%) of the total amount of the Bid) for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has submitted a Bid to said OWNER to perform the WORK required under the Bid Schedule of the OWNER's Contract Documents entitled

Lift Station Generator Enclosure

NOW THEREFORE, if said Principal is awarded a contract by said OWNER and, within the time and in the manner required in the "Notice Inviting Bids" and the "Instructions to Bidders" enters into a written Agreement on the form of Agreement bound with said Contract Documents, furnishes the required certificates of insurance, and furnishes the required Performance Bond and Payment Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by said OWNER and OWNER prevails, said Surety shall pay all costs incurred by said OWNER in such suit, including a reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this _____ day of _____, 20___

(SEAL)_____
(Principal)

(SEAL)_____
(Surety)

By:_____
(Signature)

By:_____
(Signature)

END OF SECTION

SECTION 003300 – MODIFIED BID SCHEDULE

Bidders Please Note: Before preparing this Modified Bid Schedule, carefully read the Invitation for Bids, Instructions to Bidders, and the Technical Specifications.

A Modified Bid Schedule shall not reveal the Bid price but shall provide the addition (+) or subtraction (-) to the line by line pay item so that the final prices will not be known by the OWNER until the sealed Bid is opened. Modifications shall include both the modification of the unit bid price and the total modification of each pay item modified.

Changes to the adjusted total bid amount will be computed by the Owner.

A Local Bidder Preference of five percent (5%) ___X____ will, _____ will not be utilized on this project.

Lift Station Generator Enclosure

Pay Item No.	Pay Item Description	REVISION TO UNIT PRICE BID AMOUNT +/-	REVISION TO TOTAL PRICE BID AMOUNT +/-
1	Lift Station Generator Enclosure		

BIDDER NAME: _____

BIDDER'S TELEPHONE: _____

BIDDER'S EMAIL ADDRESS: _____

MODIFICATION DATE: _____

END OF SECTION

LIST OF SUBCONTRACTORS

The apparent low Bidder must submit a list of Subcontractors that the Bidder proposes to use in the performance of this contract by close of business on the fifth calendar day following the posting of the bid tabulations. If the fifth calendar day falls on a weekend or holiday, the report is due by close of business on the next business day following the weekend or holiday. The list must include each Subcontractor's name, address, location, evidence of valid Alaska Business License, and valid Alaska Contractor's Registration under AS 08.18. ***If no Subcontractors are to be utilized in the performance of the WORK, write in ink or type "NONE" on line (1) below.***

SUBCONTRACTOR ADDRESS	[1] AK Contractor License No. / [2] AK Business License No.	[1] Contact Name / [2] Phone No.	Type of Work	Contract Amount	✓ if DBE
1.	[1] / [2]			$	☐
2.	[1] / [2]			$	☐
3.	[1] / [2]			$	☐
4.	[1] / [2]			$	☐

I certify that the above listed Alaska Business License(s) and CONTRACTOR Registration(s), if applicable, were valid at the time Bids were opened for this Project.

_____

CONTRACTOR, Authorized Signature

_____

CONTRACTOR, Printed Name

A. A Bidder may replace a listed Subcontractor if the Subcontractor:

1. fails to comply with AS 08.18;
2. files for bankruptcy or becomes insolvent;
3. fails to execute a contract with the Bidder involving performance of the WORK for which the Subcontractor was listed and the Bidder acted in good faith;
4. fails to obtain bonding;
5. fails to obtain insurance acceptable to the OWNER;
6. fails to perform the contract with the Bidder involving work for which the Subcontractor was listed;
7. must be substituted in order for the CONTRACTOR to satisfy required state and federal affirmative action requirements;
8. refuses to agree or abide with the Bidder's labor agreement; or
9. is determined by the OWNER not to be a responsible Bidder.

B. If a Bidder fails to list a Subcontractor or lists more than one Subcontractor for the same portion of WORK, the Bidder shall be considered to have agreed to perform that portion of WORK without the use of a Subcontractor and to have represented the Bidder to be qualified to perform that WORK.

C. A Bidder who attempts to circumvent the requirements of this section by listing as a Subcontractor another contractor who, in turn, sublets the majority of the WORK required under the contract violates this section.

D. If a contract is awarded to a Bidder who violates this section, the OWNER may:

1. cancel the contract; or
2. after notice and a hearing, assess a penalty on the Bidder in an amount that does not exceed 10 percent of the value of the subcontract at issue.

E. For contract award, the apparent low Bidder must submit one copy of each subcontract, to the OWNER, for WORK with a value of greater than one half of one percent of the intended award amount.

F. An apparent low Bidder who fails to submit a completed Subcontractor Report within the time specified in this section will be found to be not a responsible Bidder and may be required to forfeit the Bid security. The OWNER will then consider the next lowest Bidder for award of the contract.

END OF SECTION

SECTION 00500 - AGREEMENT

THIS AGREEMENT is between THE CITY & BOROUGH OF WRANGELL (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR) OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

CONTRACTOR shall complete the WORK as specified or as indicated under the Bid Schedule of the OWNER's Contract Documents entitled **Lift Station Generator Enclosure.** The WORK is generally described as follows:

Lift Station Generator Enclosure and install ER Generator.

A. Work under this Contract includes:

1. Sitework

a. Site utilities: Electrical

b. Rough and finish grading.

c. Miscellaneous site improvements.

2. Building Structure

a. Concrete footings and concrete foundation walls, concrete slabs on grade.

3. Building Enclosure

a. Exterior wall systems of board and batten fiber cement siding.

b. Galvanized chain link fence and louver.

c. Roofing systems of composite shingle.

4. Mechanical Systems

a. Ventilation: As needed for Electrical Standby Generator.

b. Temperature control system.

5. Electrical Systems

a. Electrical: As needed for Electrical Standby Generator.

6. Keep Architect fully informed about progress of the work, performance of the work and potential problems.

ARTICLE 2. CONTRACT COMPLETION TIME.

Substantial completion by _____.

ARTICLE 3. DATE OF AGREEMENT

The date of this Agreement will be the later of the date of the Borough Manager signature on page three of this section and the signature of the CONTRACTOR authorized representative.

ARTICLE 4. LIQUIDATED DAMAGES.

OWNER and the CONTRACTOR recognize that time is of the essence of this Agreement and that the OWNER will suffer financial loss if the WORK is not completed within the time specified in Article 2 herein, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal preceding the actual damages suffered by the OWNER if the WORK is not completed on time. Accordingly, instead of requiring any such proof, the OWNER and the CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) the CONTRACTOR shall pay the OWNER $***1,500*** for each Calendar Day that expires after the substantial completion time specified in Article 2 above. The amount of liquidated damages specified above is agreed to be a reasonable estimate based on all facts known as of the date of this Agreement.

ARTICLE 5. CONTRACT PRICE.

OWNER shall pay CONTRACTOR for completion of the WORK in accordance with the Contract Documents in the amount set forth in the Bid Schedule. The CONTRACTOR agrees to accept as full and complete payment for all WORK to be done in this contract for: _____ those Unit Price amounts as set forth in the Bid Schedule in the Contract Documents for this Project.

The total amount of this contract shall be_____, except as adjusted in accordance with the provisions of the Contract Documents.

ARTICLE 6. PAYMENT PROCEDURES.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by the ENGINEER as provided in the General Conditions.

Progress payments will be paid in full in accordance with Article 14 of the General Conditions until ninety (90) percent of the Contract Price has been paid. The remaining ten (10) percent of the Contract Price may be retained, in accordance with applicable Alaska State Statutes, until final inspection, completion, and acceptance of the Project by the OWNER.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire Agreement between OWNER and CONTRACTOR concerning the WORK consist of this Agreement (pages 00500-1 to 00500-6, inclusive) and the following sections of the Contract Documents:

- Table of Contents
- Notice Inviting Bids
- Instructions to Bidders
- Bid
- Bid Schedule
- Bid Bond
- Subcontractor Report
- Performance Bond
- Payment Bond
- Insurance Certificate(s)

- General Conditions
- Supplementary General Conditions
- Alaska Labor Standards, Reporting, and Prevailing Wage Determination
- Permits
- Technical Specifications as listed in the Table of Contents
- _____ Drawings consisting of ____ sheets, as listed in the Table of Contents
- _____ Drawings consisting of ____ sheets, as listed in the Table of Contents
- Addenda numbers ___ to ____, inclusive.
- Change Orders which may be delivered or issued after the Date of the Agreement and which are not attached hereto

There are no Contract Documents other than those listed in this Article 7. The Contract Documents may only be amended by Change Order as provided in Paragraph 3.3 of the General Conditions.

ARTICLE 8. MISCELLANEOUS.

Terms used in this Agreement, which are defined in Article 1 of the General Conditions, will have the meanings indicated in the General Conditions.

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such written consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents. CONTRACTOR understands and agrees that the Borough will not accept any assignment of this Contract to an LLC unless all the members of the LLC sign as guarantors of performance of this Contract.

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents. This Agreement shall be governed by the laws of the State of Alaska. The Superior Court for the State of Alaska, First Judicial District at Wrangell, Alaska, shall be the exclusive jurisdiction and venue for any action of any kind an any nature arising out of or relating to this Agreement and all Contract documents or for any action of any kind and any nature arising out of or related to the performance of non-performance of the CONTRACTOR, and CONTRACTOR'S employees, subcontractors, consultants and representatives.

The CONTRACTOR acknowledges that the CONTRACTOR has read and understands the terms of this Agreement and the terms and conditions of all the Contract documents listed in this Agreement and has had the opportunity to review the Agreement with counsel of his/her choice, and is executing this Agreement of his/her own free will. CONTRACTOR acknowledges and agrees that CONTRACTOR is not relying on any representations by any Borough employee, the Mayor, an assembly member, the borough attorney, the borough manager or any consultant of the Borough in deciding to enter this Agreement and perform this project.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have caused this Agreement to be executed on the date listed below by OWNER.

OWNER:	**CONTRACTOR:**
City & Borough of Wrangell	_____ (Company Name)
_____ (Signature)	_____ (Signature)
By: Jeff Good, Borough Manager (Printed Name)	By: _____ (Printed Name, Authority or Title)
Date: _____	Date: _____
Address: P.O. Box 531	Address: _____
Wrangell, Alaska 99929	_____
907-874-2381 907-874-3952 (Telephone) (Fax)	_____ (Telephone) (Fax)
	_____ (E-mail address)

Owner Attest:	Contractor Attest:
By: _____ Kim Lane, Borough Clerk	By: _____ Name/Title:

Approved as to Form:

By: _____ Date: _____
Joe Levesque
Attorney for the City and Borough of Wrangell

Approved:

By: _____ Date: _____
Steve Prysunka, Borough Mayor

CERTIFICATE
(if Corporation)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Board of Directors of the

_____a corporation existing under the laws of

the State of_____, held on _____, 20____, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ President of the Corporation, be and is hereby authorized to **execute the Agreement** with OWNER and this corporation and that the execution thereof, attested by the Secretary of the Corporation, and with the Corporate Seal affixed, shall be the official act and deed of this Corporation."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the Corporation this _____ day of _____, 20____.

_____
Secretary

(SEAL)

CERTIFICATE
(if Partnership)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Partners of the

_____ a partnership existing under the laws of the State

of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ of the Partnership, be and is hereby authorized to **execute the Agreement** with the OWNER and this partnership and that the execution thereof, attested by the _____shall be the official act and deed of this Partnership."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20_____.

_____
Secretary

(SEAL)

CERTIFICATE
(if Joint Venture)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Principals of the

_____ a joint venture existing under the laws of the

State of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ of the Joint Venture, be and is hereby authorized to **execute the Agreement** with the OWNER and this joint venture and that the execution thereof, attested by the _____ shall be the official act and deed of this Joint Venture."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20___.

_____
Secretary

(SEAL)

CERTIFICATE
(If Limited Liability Company)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the members of the

_____, a Limited Liability Company (LLC) existing under the laws of the State of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, acting as _____ of the Limited Liability Company, is hereby authorized by all Members to **execute the Agreement** with the OWNER and this Limited Liability Company and that the execution thereof, attested by the _____ shall be the official act and deed of this Limited liability Company."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20___.

_____
Secretary

(SEAL)

By: _____
(Signature of authorized Member)

_____
(Title of person signing)

END OF SECTION

SECTION 005000 - AGREEMENT

THIS AGREEMENT is between THE CITY & BOROUGH OF WRANGELL (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR) OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

CONTRACTOR shall complete the WORK as specified or as indicated under the Bid Schedule of the OWNER's Contract Documents entitled **Lift Station Generator Enclosure.** The WORK is generally described as follows:

Lift Station Generator Enclosure and install ER Generator.

A. Work under this Contract includes:

1. Sitework

a. Site utilities: Electrical

b. Rough and finish grading.

c. Miscellaneous site improvements.

2. Building Structure

a. Concrete footings and concrete foundation walls, concrete slabs on grade.

3. Building Enclosure

a. Exterior wall systems of board and batten fiber cement siding.

b. Galvanized chain link fence and louver.

c. Roofing systems of composite shingle.

4. Mechanical Systems

a. Ventilation: As needed for Electrical Standby Generator.

b. Temperature control system.

5. Electrical Systems

a. Electrical: As needed for Electrical Standby Generator.

6. Keep Architect fully informed about progress of the work, performance of the work and potential problems.

ARTICLE 2. CONTRACT COMPLETION TIME.

Substantial completion by _____.

ARTICLE 3. DATE OF AGREEMENT

The date of this Agreement will be the later of the date of the Borough Manager signature on page three of this section and the signature of the CONTRACTOR authorized representative.

ARTICLE 4. LIQUIDATED DAMAGES.

OWNER and the CONTRACTOR recognize that time is of the essence of this Agreement and that the OWNER will suffer financial loss if the WORK is not completed within the time specified in Article 2 herein, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal preceding the actual damages suffered by the OWNER if the WORK is not completed on time. Accordingly, instead of requiring any such proof, the OWNER and the CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) the CONTRACTOR shall pay the OWNER $***1,500*** for each Calendar Day that expires after the substantial completion time specified in Article 2 above. The amount of liquidated damages specified above is agreed to be a reasonable estimate based on all facts known as of the date of this Agreement.

ARTICLE 5. CONTRACT PRICE.

OWNER shall pay CONTRACTOR for completion of the WORK in accordance with the Contract Documents in the amount set forth in the Bid Schedule. The CONTRACTOR agrees to accept as full and complete payment for all WORK to be done in this contract for: _____ those Unit Price amounts as set forth in the Bid Schedule in the Contract Documents for this Project.

The total amount of this contract shall be_____, except as adjusted in accordance with the provisions of the Contract Documents.

ARTICLE 6. PAYMENT PROCEDURES.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by the ENGINEER as provided in the General Conditions.

Progress payments will be paid in full in accordance with Article 14 of the General Conditions until ninety (90) percent of the Contract Price has been paid. The remaining ten (10) percent of the Contract Price may be retained, in accordance with applicable Alaska State Statutes, until final inspection, completion, and acceptance of the Project by the OWNER.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire Agreement between OWNER and CONTRACTOR concerning the WORK consist of this Agreement (pages 00500-1 to 00500-6, inclusive) and the following sections of the Contract Documents:

- Table of Contents
- Notice Inviting Bids
- Instructions to Bidders
- Bid
- Bid Schedule
- Bid Bond
- Subcontractor Report
- Performance Bond
- Payment Bond
- Insurance Certificate(s)

- General Conditions
- Supplementary General Conditions
- Alaska Labor Standards, Reporting, and Prevailing Wage Determination
- Permits
- Technical Specifications as listed in the Table of Contents
- _____ Drawings consisting of ____ sheets, as listed in the Table of Contents
- _____ Drawings consisting of ____ sheets, as listed in the Table of Contents
- Addenda numbers ___ to ____, inclusive.
- Change Orders which may be delivered or issued after the Date of the Agreement and which are not attached hereto

There are no Contract Documents other than those listed in this Article 7. The Contract Documents may only be amended by Change Order as provided in Paragraph 3.3 of the General Conditions.

ARTICLE 8. MISCELLANEOUS.

Terms used in this Agreement, which are defined in Article 1 of the General Conditions, will have the meanings indicated in the General Conditions.

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such written consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents. CONTRACTOR understands and agrees that the Borough will not accept any assignment of this Contract to an LLC unless all the members of the LLC sign as guarantors of performance of this Contract.

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents. This Agreement shall be governed by the laws of the State of Alaska. The Superior Court for the State of Alaska, First Judicial District at Wrangell, Alaska, shall be the exclusive jurisdiction and venue for any action of any kind an any nature arising out of or relating to this Agreement and all Contract documents or for any action of any kind and any nature arising out of or related to the performance of non-performance of the CONTRACTOR, and CONTRACTOR'S employees, subcontractors, consultants and representatives.

The CONTRACTOR acknowledges that the CONTRACTOR has read and understands the terms of this Agreement and the terms and conditions of all the Contract documents listed in this Agreement and has had the opportunity to review the Agreement with counsel of his/her choice, and is executing this Agreement of his/her own free will. CONTRACTOR acknowledges and agrees that CONTRACTOR is not relying on any representations by any Borough employee, the Mayor, an assembly member, the borough attorney, the borough manager or any consultant of the Borough in deciding to enter this Agreement and perform this project.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have caused this Agreement to be executed on the date listed below by OWNER.

OWNER:

City & Borough of Wrangell

(Signature)

By: Jeff Good, Borough Manager
(Printed Name)

Date:

Address: P.O. Box 531

Wrangell, Alaska 99929

907-874-2381 907-874-3952
(Telephone) (Fax)

CONTRACTOR:

(Company Name)

(Signature)

By:
(Printed Name, Authority or Title)

Date:

Address:

(Telephone) (Fax)

(E-mail address)

Owner Attest:

By:
Kim Lane, Borough Clerk

Contractor Attest:

By:
Name/Title:

Approved as to Form:

By:
Joe Levesque
Attorney for the City and Borough of Wrangell

Date:

Approved:

By:
Steve Prysunka, Borough Mayor

Date:

CERTIFICATE
(if Corporation)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Board of Directors of the

_____a corporation existing under the laws of

the State of_____, held on _____, 20____, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ President of the Corporation, be and is hereby authorized to **execute the Agreement** with OWNER and this corporation and that the execution thereof, attested by the Secretary of the Corporation, and with the Corporate Seal affixed, shall be the official act and deed of this Corporation."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the Corporation this _____ day of _____, 20____.

_____
Secretary

(SEAL)

CERTIFICATE
(if Partnership)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Partners of the

_____ a partnership existing under the laws of the State

of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ of the Partnership, be and is hereby authorized to **execute the Agreement** with the OWNER and this partnership and that the execution thereof, attested by the _____shall be the official act and deed of this Partnership."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20_____.

_____
Secretary

(SEAL)

CERTIFICATE
(if Joint Venture)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Principals of the

_____ a joint venture existing under the laws of the

State of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ of the Joint Venture, be and is hereby authorized to **execute the Agreement** with the OWNER and this joint venture and that the execution thereof, attested by the _____ shall be the official act and deed of this Joint Venture."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20___.

_____
Secretary

(SEAL)

CERTIFICATE
(If Limited Liability Company)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the members of the

_____, a Limited Liability Company (LLC) existing under the laws of the State of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, acting as _____ of the Limited Liability Company, is hereby authorized by all Members to **execute the Agreement** with the OWNER and this Limited Liability Company and that the execution thereof, attested by the _____ shall be the official act and deed of this Limited liability Company."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20___.

_____
Secretary

(SEAL)

By: _____
(Signature of authorized Member)

_____
(Title of person signing)

END OF SECTION

SECTION 006100 - PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we _____
(Name of Contractor)
_____ a _____
(Corporation, Partnership, Individual)

hereinafter called "Principal" and _____
(Surety)
of _____, State of _____hereinafter called the "Surety," are held and firmly bound to the CITY & BOROUGH of WRANGELL, ALASKA hereinafter called "OWNER,"
(Owner) (City and State)
for the penal sum of _____

_____dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the CONTRACTOR has entered into a certain contract with the OWNER, the effective date of which is _____, a copy of which is hereto attached and made a part hereof for the construction of:

Lift Station Generator Enclosure

NOW, THEREFORE, if the Principal shall truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof, which may be granted by the OWNER, with or without notice to the Surety, and if it shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By:_____
(Signature)

_____
(Printed Name)

_____
(Company Name)

_____
(Street or P.0. Box)

_____
(City, State, Zip Code)

SURETY:

By: _____ Date Issued:_____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Company Name)

_____
(Street or P.0. Box)

_____
(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If CONTRACTOR is Partnership, all Partners must execute bond.

END OF SECTION

SECTION 00620*0* - PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we _____
(Name of Contractor)
_____ a _____
(Corporation, Partnership, Individual)

hereinafter called "Principal" and _____
(Surety)
of _____, State of _____hereinafter called the "Surety," are held and firmly bound to the CITY & BOROUGH of WRANGELL, ALASKA hereinafter called "OWNER,"
(Owner) (City and State)
for the penal sum of _____

_____dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the CONTRACTOR has entered into a certain contract with the OWNER, the effective date of which is _____, a copy of which is hereto attached and made a part hereof for the construction of:

Lift Station Generator Enclosure

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for, or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said work, and for all labor performed in such WORK, whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By:_____
(Signature)

_____
(Printed Name)

_____
(Company Name)

_____
(Street or P.0. Box)

_____
(City, State, Zip Code)

SURETY:

By: _____ Date Issued:_____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Company Name)

_____
(Street or P.0. Box)

_____
(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If CONTRACTOR is Partnership, all Partners must execute bond.

END OF SECTION

TABLE OF CONTENTS

ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES (Cont'd.)

ARTICLE 7 OTHER WORK

ARTICLE 8 OWNER'S RESPONSIBILITIES

ARTICLE 9 ENGINEER'S STATUS DURING CONSTRUCTION

ARTICLE 10 CHANGES IN THE WORK

ARTICLE 11 CHANGE OF CONTRACT PRICE

ARTICLE 1 DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof. Where an entire word is capitalized in the definitions and is found not capitalized in the Contract Documents it has the ordinary dictionary definition.

Addenda - Written or graphic instruments issued prior to the opening of Bids which make additions, deletions, or revisions to the Contract Documents.

Agreement - The written contract between the OWNER and the CONTRACTOR covering the WORK to be performed; other documents are attached to the Agreement and made a part thereof as listed out in the Agreement.

Application for Payment - The form furnished by the ENGINEER which is to be used by the CONTRACTOR to request progress or final payment and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

Asbestos - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Bid - The offer or proposal of the Bidder submitted on the prescribed form setting forth the price or prices for the WORK.

Bonds - Bid, Performance, and Payment Bonds and other instruments which protect against loss due to inability or refusal of the CONTRACTOR to perform its contract.

Project Manager - The authorized representative of the City and Borough of Wrangell, as OWNER, who is responsible for administration of the contract.

Change Order - A document recommended by the ENGINEER, which is signed by the CONTRACTOR and the OWNER and authorizes an addition, deletion, or revision in the WORK, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

Contract Documents - The Table of Contents, Notice Inviting Bids, Instructions to Bidders, Bid Forms (including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates and affidavits), Agreement, Performance Bond, Payment Bond, General Conditions, Supplementary General Conditions, Technical Specifications, Drawings, Permits, and all Addenda, and Change Orders executed pursuant to the provisions of the Contract Documents.

Contract Price - The total monies payable by the OWNER to the CONTRACTOR under the terms and conditions of the Contract Documents.

Contract Time - The number of successive calendar days stated in the Contract Documents for the completion of the WORK.

CONTRACTOR - The individual, partnership, corporation, joint-venture or other legal entity with whom the OWNER has executed the Agreement.

Day - A calendar day of 24 hours measured from midnight to the next midnight.
Defective WORK - WORK that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or WORK that has been damaged prior to the ENGINEER's recommendation of final payment.

Drawings - The Drawings, plans, maps, profiles, diagrams, and other graphic representations which indicate the character, location, nature, extent, and scope of the WORK and which have been prepared by the ENGINEER and are referred to in the Contract Documents. Shop Drawings are not within the meaning of this paragraph.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

Engineer of Record - The individual, partnership, corporation, joint-venture or other legal entity named as such in the Contract Documents.

ENGINEER - The ENGINEER is the firm or person(s) selected by the OWNER to perform the duties of project inspection and management. Wrangell will inform the CONTRACTOR of the identity of the ENGINEER at or before the Notice to Proceed.

Field Order - A written order issued by the ENGINEER which may or may not involve a change in the WORK.

General Requirements - Division 1 of the Technical Specifications.

Hazardous Waste - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 9603) as amended from time to time.

Holidays - Legal holidays occur on:

1. New Year's Day - January 1
2. Martin Luther King's Birthday - Third Monday in January
3. President's Day - Third Monday in February
4. Seward's Day - Last Monday in March
5. Memorial Day - Last Monday in May
6. Independence Day - July 4
7. Labor Day - First Monday in September
8. Alaska Day - October 18
9. Veteran's Day - November 11
10. Thanksgiving Day - Fourth Thursday and the following Friday in November
11. Christmas Day – December 25

If any holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal holidays. If the holiday should fall on a Sunday, Sunday and the following Monday are both legal holidays.

Inspector - The authorized representative of the ENGINEER assigned to make detailed inspections for conformance to the Contract Documents. Any reference to the Resident Project Representative in this document shall mean the Inspector.

Laws and Regulations; Laws or Regulations - Any and all applicable laws, rules, regulations, ordinances, codes, and/or orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

Mechanic's Lien - A form of security, an interest in real property, which is held to secure the payment of an obligation. When referred to in these Contract Documents, "Mechanic's Lien" or "lien" means "Stop Notice".

Milestone - A principal event specified in the Contract Documents relating to an intermediate completion date of a portion of the WORK, or a period of time within which the portion of the WORK should be performed prior to Substantial Completion of all the WORK.

Notice of Intent to Award - The written notice by the OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the requirements listed therein, within the time specified, the OWNER will enter into an Agreement.

Notice of Award - The written notice by the OWNER to the apparent successful bidder stating that the apparent successful bidder has complied with all conditions for award of the contract.

Notice of Substantial Completion - A form signed by the ENGINEER and the CONTRACTOR recommending to the OWNER that the WORK is Substantially Complete and fixing the date of Substantial Completion. After acceptance of the WORK by the OWNER's governing body, the form is signed by the OWNER and filed with the County Recorder. This filing starts the 30 day lien filing period on the WORK.

Notice to Proceed - The written notice issued by the OWNER to the CONTRACTOR authorizing the CONTRACTOR to proceed with the WORK and establishing the date of commencement of the Contract Time.

OWNER - The City and Borough of Wrangell, acting through its legally designated officials, officers, or employees.

Partial Utilization - Use by the OWNER or a substantially completed part of the WORK for the purpose for which it is intended prior to Substantial Completion of all the WORK.

PCB's - Polychlorinated biphenyls.

PERMITTEE – CONTRACTOR.

Petroleum - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

Project - The total construction of which the WORK to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Radioactive Material - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

Shop Drawings - All Drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR and submitted by the CONTRACTOR, to the ENGINEER, to illustrate some portion of WORK.

Specifications - (Same definition as for Technical Specifications hereinafter).

Stop Notice - A legal remedy for Subcontractors and suppliers who contribute to public works, but who are not paid for their WORK, which secures payment from construction funds possessed by the OWNER. For public property, the Stop Notice remedy is designed to substitute for mechanic's lien rights.

Sub-Consultant - The individual, partnership, corporation, joint-venture or other legal entity having a direct contract with ENGINEER, or with any of its Consultants to furnish services with respect to the Project.

Subcontractor - An individual, partnership, corporation, joint-venture or other legal entity having a direct contract with the CONTRACTOR, or with any of its Subcontractors, for the performance of a part of the WORK at the site.

Substantial Completion - Refers to when the WORK has progressed to the point where, in the opinion of the ENGINEER as evidenced by Notice of Completion as applicable, it is sufficiently complete, in accordance with the Contract Documents, so that the WORK can be utilized for the purposes for which it is intended; or if no such notice is issued, when final payment is due in accordance with Paragraph 14.8. The terms "substantially complete" and "substantially completed" as applied to any WORK refer to substantial completion thereof.

Supplementary General Conditions (SGC) - The part of the Contract Documents which make additions, deletions, or revisions to these General Conditions.

Supplier - A manufacturer, fabricator, supplier, distributor, materialman, or vendor.

Technical Specifications - Divisions 1 through 16 of the Contract Documents consisting of the General Requirements and written technical descriptions of products and execution of the WORK.

Underground Utilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: water, sewage and drainage removal, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic, or other control systems.

WORK - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. WORK is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

ARTICLE 2 PRELIMINARY MATTERS

2.1 DELIVERY OF BONDS/INSURANCE CERTIFICATES. When the CONTRACTOR delivers the signed Agreements to the OWNER, the CONTRACTOR shall also deliver to the OWNER

such Bonds and Insurance Policies and Certificates as the CONTRACTOR may be required to furnish in accordance with the Contract Documents.

2.2 COPIES OF DOCUMENTS. The OWNER shall furnish to the CONTRACTOR the required number of copies of the Contract Documents specified in the Supplementary General Conditions.

2.3 COMMENCEMENT OF CONTRACT TIME; NOTICE TO PROCEED. The Contract Time will start to run on the commencement date stated in the Notice to Proceed.

2.4 STARTING THE WORK

A. The CONTRACTOR shall begin to perform the WORK within 10 days after the commencement date stated in the Notice to Proceed, but no WORK shall be done at the site prior to the commencement date, including mobilization.

B. Before undertaking each part of the WORK, the CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. The CONTRACTOR shall promptly report in writing to the ENGINEER any conflict, error, or discrepancy which the CONTRACTOR may discover and shall obtain a written interpretation or clarification from the ENGINEER before proceeding with any WORK affected thereby.

C. The CONTRACTOR shall submit to the ENGINEER for review those documents called for under Section 01300 - Contractor Submittals in the General Requirements.

2.5 PRE-CONSTRUCTION CONFERENCE. The CONTRACTOR is required to attend a Pre-Construction Conference. This conference will be attended by the ENGINEER and others as appropriate in order to discuss the WORK in accordance with the applicable procedures specified in the General Requirements, Section 01010 - Summary of Work in the General Requirements.

ARTICLE 3 CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.1 INTENT

A. The Contract Documents comprise the entire Agreement between the OWNER and the CONTRACTOR concerning the WORK. The Contract Documents shall be construed as a whole in accordance with Alaska Law.

B. It is the intent of the Contract Documents to describe the WORK, functionally complete, to be constructed in accordance with the Contract Documents. Any work, materials, or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe work, materials, or equipment such words or phrases shall be interpreted in accordance with that meaning, unless a definition has been provided in Article 1 of the General Conditions. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification,

manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the OWNER, the CONTRACTOR, or the ENGINEER or any of their consultants, agents, or employees from those set forth in the Contract Documents.

C. If, during the performance of the WORK, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the WORK or of any such standard, specification, manual or code or of any instruction of any Supplier referred to in paragraph 6.5, the CONTRACTOR shall report it to the ENGINEER in writing at once, and the CONTRACTOR shall not proceed with the WORK affected thereby (except in an emergency as authorized by the ENGINEER) until a clarification field order, or Change Order to the Contract Documents has been issued.

3.2 ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS

A. In resolving conflicts resulting from, errors, or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Permits from other agencies as may be required by law, excepting the definition of "PERMITEE" in these permits.
2. Field Orders
3. Change Orders
4. ENGINEER's written interpretations and clarifications.
5. Agreement
6. Addenda
7. CONTRACTOR's Bid (Bid Form)
8. Supplementary General Conditions
9. Notice Inviting Bids
10. Instructions to Bidders
11. General Conditions
12. Technical Specifications
13. Drawings

B. With reference to the Drawings the order of precedence is as follows:

1. Figures govern over scaled dimensions
2. Detail Drawings govern over general Drawings
3. Addenda/ Change Order drawings govern over Contract Drawings
4. Contract Drawings govern over standard drawings

3.3 AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS. The Contract Documents may be amended to provide for additions, deletions, and revisions in the WORK or to modify the terms and conditions thereof by a Change Order (pursuant to Article 10 CHANGES IN THE WORK).

3.4 REUSE OF DOCUMENTS. Neither the CONTRACTOR, nor any Subcontractor or Supplier, nor any other person or organization performing any of the WORK under a contract with the OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Technical Specifications, or other

documents used on the WORK, and they shall not reuse any of them on the extensions of the Project or any other project without written consent of the OWNER.

ARTICLE 4 AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

4.1 AVAILABILITY OF LANDS. The OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the WORK is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of the CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the OWNER, unless otherwise provided in the Contract Documents. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or rights-of-way provided. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment; provided, that the CONTRACTOR shall not enter upon nor use any property not under the control of the OWNER until a written temporary construction easement, lease or other appropriate agreement has been executed by the CONTRACTOR and the property owner, and a copy of said agreement furnished to the ENGINEER prior to said use; and, neither the OWNER nor the ENGINEER shall be liable for any claims or damages resulting from the CONTRACTOR's unauthorized trespass or use of any such properties.

4.2 PHYSICAL CONDITIONS - SUBSURFACE AND EXISTING STRUCTURES

A. Explorations and Reports. Reference is made to SGC 4.2 Physical Conditions of the Supplementary General Conditions for identification of those reports of explorations and tests of sub-surface conditions at the site that have been utilized by the ENGINEER in the preparation of the Contract Documents. The CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, however, reports are not to be considered complete or comprehensive and nontechnical data, interpretations, and opinions contained in such reports shall be verified by the CONTRACTOR prior to bid. The CONTRACTOR is responsible for any further explorations or tests that may be necessary and any interpretation, interpolation, or extrapolation that it makes of any information shown in such reports.

B. Existing Structures. Reference is made to SGC 4.2 Physical Conditions of the Supplementary General Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Utilities referred to in Paragraph 4.4 herein) which are at or contiguous to the site that have been utilized by the ENGINEER in the preparation of the Contract Documents. The CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, however, nontechnical data, interpretations, and opinions contained in such drawings shall be verified by the CONTRACTOR prior to bid. The CONTRACTOR is also responsible for any interpretation, interpolation, or extrapolation that it makes of any information shown in such drawings.

4.3 DIFFERING SITE CONDITIONS

A. The CONTRACTOR shall promptly upon discovery (but in no event later than 14 days thereafter) and before the following conditions are disturbed, notify the ENGINEER, in writing of any:

1. Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Article 1 of these General Conditions, or asbestos, PCB's,

petroleum or any other substance or material posing a threat to human or to the environment.

2. Subsurface or latent physical conditions at the site differing from those indicated in the reports referenced in SGC 4.2 Physical Conditions.
3. Unknown physical conditions at the site of any unusual nature, differing materially from those physical conditions ordinarily encountered in the area of project and generally recognized as inherent in the area of the project and as ordinarily encountered and inherent in WORK of the character provided for in the contract. Weather conditions specifically do not constitute any change condition under this section.

B. The OWNER shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR's cost of, or the time required for, performance of any part of the WORK shall issue a Change Order under the procedures described in the contract.

C. In the event that a dispute arises between the OWNER and the CONTRACTOR whether the conditions materially differ, or involved hazardous waste or other materials listed above, or cause a decrease or increase in the CONTRACTOR's cost of, or time required for, performance of any part of the WORK, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all WORK to be performed under the contract. The CONTRACTOR and OWNER shall retain any and all rights provided either by contract or by Law which pertain to the resolution of disputes and protests between the contracting parties.

4.4 PHYSICAL CONDITIONS - UNDERGROUND UTILITIES

A. Indicated. The information and data indicated in the Contract Documents with respect to existing Underground Utilities at or contiguous to the site are based on information and data furnished to the OWNER or the ENGINEER by the owners of such Underground Utilities or by others. Unless it is expressly provided in the Supplementary General Conditions and/or Section 01530 - Protection and Restoration of Existing Facilities of the General Requirements, the OWNER and the ENGINEER shall not be responsible for the accuracy or completeness of any such information or data, and the CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Utilities indicated in the Contract Documents, for coordination of the WORK with the owners of such Underground Utilities during construction, for the safety and protection thereof and repairing any damage thereto resulting from the WORK, the cost of which will be considered as having been included in the Contract Price.

B. Not Indicated. If an Underground Utility is uncovered or revealed at or contiguous to the site which was not indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall identify the owner of such Underground Utility and give written notice thereof to that owner and shall notify the ENGINEER in accordance with the requirements of the Supplementary General Conditions and Section 01530 - Protection and Restoration of Existing Facilities of the General Requirements.

4.5 REFERENCE POINTS

A. The ENGINEER will provide one benchmark, near or on the site of the WORK, and will provide two points near or on the site to establish a base line for use by the CONTRACTOR for alignment control. Unless otherwise specified in the General Requirements, the CONTRACTOR shall furnish all other lines, grades, and benchmarks required for proper execution of the WORK.

B. The CONTRACTOR shall preserve all bench marks, stakes, and other survey marks, and in case of their removal or destruction by its own employees or by its Subcontractor's employees, the CONTRACTOR shall be responsible for the accurate replacement of such reference points by personnel qualified under the Alaska Statute governing the licensing of Architects, Engineers, and Land Surveyors.

ARTICLE 5 BONDS AND INSURANCE

5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS

A. The CONTRACTOR shall furnish, when required, Performance and Payment Bonds on forms provided by the OWNER for the penal sums of 100% of the amount of the Bid award. The surety on each bond may be any corporation or partnership authorized to do business in the State of Alaska as an insurer under AS 21.09. These bonds shall remain in effect for 12 months after the date of final payment and until all obligations and liens under this contract have been satisfied. The CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary General Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

B. If the surety on any Bond furnished by the CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the WORK is located, the CONTRACTOR shall within 7 days thereafter substitute another Bond and Surety, which must be acceptable to the OWNER.

C. All Bonds required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety companies that are duly licensed or authorized in the State of Alaska to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions. The City Manager may, on behalf of the OWNER, notify the surety of any potential default or liability.

5.2 INSURANCE

A. The CONTRACTOR shall purchase and maintain the insurance required under this paragraph. Such insurance shall include the specific coverages set out herein and be written for not less than the limits of liability and coverages provided in the Supplementary General Conditions, or required by law, whichever are greater. All insurance shall be maintained continuously during the life of the Agreement up to the date of Final Completion and at all times thereafter when the CONTRACTOR may be correcting, removing, or replacing Defective WORK in accordance with Paragraph 13.6, but the CONTRACTOR's liabilities under this Agreement shall not be deemed limited in any way to the insurance coverage required.

B. All insurance required by the Contract Documents to be purchased and maintained by the CONTRACTOR shall be obtained from insurance companies that are duly licensed or authorized in the State of Alaska to issue insurance policies for the limits and coverages so required. Such insurance companies shall have a current Best's Rating of at least an "A" (Excellent) general policy holder's rating and a Class VII financial size category and shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

C. The City and Borough of Wrangell shall be listed as an additional insured on the CONTRACTOR'S general liability insurance policy and the CONTRACTOR'S pollution liability policy. CONTRACTOR shall furnish certificates to the Borough of such insurance and showing the Borough as an additional insured within ten days of receiving the Notice to Proceed. Failure to comply with this provision constitutes a material breach and default of the Agreement.

ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES

6.1 SUPERVISION AND SUPERINTENDENCE

A. The CONTRACTOR shall supervise, inspect, and direct the WORK competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the WORK in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incidental thereto. The CONTRACTOR shall be responsible to see that the completed WORK complies accurately with the Contract Documents.

B. The CONTRACTOR shall designate in writing and keep on the WORK site at all times during its progress a technically qualified, English-speaking superintendent, who is an employee of the CONTRACTOR and who shall not be replaced without written notice to the OWNER and the ENGINEER. The superintendent will be the CONTRACTOR's representative at the site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the superintendent shall be as binding as if given to the CONTRACTOR. The CONTRACTOR shall issue all its communications to the OWNER through the ENGINEER and the ENGINEER only.

C. The CONTRACTOR's superintendent shall be present at the site of the WORK at all times while WORK is in progress. Failure to observe this requirement shall be considered

suspension of the WORK by the CONTRACTOR until such time as such superintendent is again present at the site.

6.2 LABOR, MATERIALS, AND EQUIPMENT

A. The CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the WORK and perform construction as required by the Contract Documents. The CONTRACTOR shall furnish, erect, maintain, and remove the construction plant and any temporary works as may be required. The CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the WORK or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all WORK at the site shall be performed during regular working hours, and the CONTRACTOR will not permit overtime work or the performance of work on Saturday, Sunday, or any legal holiday without the OWNER's written consent. The CONTRACTOR shall apply for this consent through the ENGINEER.

B. Except as otherwise provided in this Paragraph, the CONTRACTOR shall receive no additional compensation for overtime work, i.e., work in excess of 8 hours in any one calendar day or 40 hours in any one calendar week, even though such overtime work may be required under emergency conditions and may be ordered by the ENGINEER in writing. Additional compensation will be paid the CONTRACTOR for overtime work only in the event extra work is ordered by the ENGINEER and the Change Order specifically authorizes the use of overtime work and then only to such extent as overtime wages are regularly being paid by the CONTRACTOR for overtime work of a similar nature in the same locality.

C. All costs of inspection and testing performed during overtime work by the CONTRACTOR which is allowed solely for the convenience of the CONTRACTOR shall be borne by the CONTRACTOR. The OWNER shall have the authority to deduct the cost of all such inspection and testing from any partial payments otherwise due to the CONTRACTOR.

D. Unless otherwise specified in the Contract Documents, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the WORK, including all mobilization and demobilization.

E. All materials and equipment to be incorporated into the WORK shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of the OWNER. If required by the ENGINEER, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provisions of any such instructions will be effective to assign to the ENGINEER, or any of the ENGINEER consultants, agents, or employees, any duty or authority to supervise

or direct the furnishing or performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraphs 9.9C and 9.9D.

F. The CONTRACTOR shall at all times employ sufficient labor and equipment for prosecuting the several classes of WORK to full completion in the manner and time set forth in and required by these specifications. All workers shall have sufficient skill and experience to perform property the WORK assigned to them. Workers engaged in special WORK, or skilled WORK, shall have sufficient experience in such WORK and in the operation of the equipment required to perform all WORK, properly and satisfactorily.

G. Any person employed by the CONTRACTOR or by any Subcontractor who, in the opinion of the ENGINEER, does not perform the WORK in a proper and skillful manner, or is intemperate or disorderly shall, at the written request of the ENGINEER, be removed forthwith by the CONTRACTOR or Subcontractor employing such person, and shall not be employed again in any portion of the WORK without the approval of the ENGINEER. Should the CONTRACTOR fail to remove such person or persons as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the WORK, the ENGINEER may suspend the WORK by written notice until such orders are complied with.

6.3 ADJUSTING PROGRESS SCHEDULE. The CONTRACTOR shall submit monthly updates of the progress schedule to the ENGINEER for acceptance in accordance with the provisions in Section 01300 - Contractor Submittals in the General Requirements.

6.4 SUBSTITUTES OR “OR-EQUAL” ITEMS. The CONTRACTOR shall submit proposed substitutes or “or-equal” items in accordance with the provisions in Section 01300 - Contractor Submittals in the General Requirements.

6.5 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS.

A. The CONTRACTOR shall be responsible to the OWNER and the ENGINEER for the acts and omissions of its Subcontractors and their employees to the same extent as CONTRACTOR is responsible for the acts and omissions of its own employees. Nothing contained in this Paragraph shall create any contractual relationship between any Subcontractor and the OWNER or the ENGINEER nor relieve the CONTRACTOR of any liability or obligation under the Agreement and Contract documents.

B. The CONTRACTOR shall perform not less than 40% of the WORK with its own forces (i.e., without subcontracting). The 40% requirement shall be understood to mean that the CONTRACTOR shall perform, with its own organization, WORK amounting to at least 40% of the awarded contract amount. The 40% requirement will be calculated based upon the total of the subcontract amounts submitted for contract award, and any other information requested by the OWNER from the apparent low bidder.

6.6 PERMITS

A. Unless otherwise provided in the Supplementary General Conditions, the CONTRACTOR shall obtain and pay for all construction permits and licenses from the agencies having jurisdiction, including the furnishing of insurance and bonds if required by such agencies. The enforcement of such requirements under this contract shall not be made the basis for claims for additional compensation. The OWNER shall assist the

CONTRACTOR, when necessary, in obtaining such permits and licenses. The CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the WORK, which are applicable at the time of opening of Bids. The CONTRACTOR shall pay all charges of utility owners for connections to the WORK.

B. These Contract Documents may require that the WORK be performed within the conditions and/or requirements of local, state and/or federal permits. These permits may be bound within the Contract Documents, included within the Contract Documents by reference, or included as part of the WORK, as designated in this Section. The CONTRACTOR is responsible for completing the WORK required for compliance with all permit requirements; this WORK is incidental to other items in the Contract Documents. Any reference to the "permittee" in the permits shall mean the CONTRACTOR. If any permits were acquired by the OWNER, this action was done to expedite the start of construction. If the CONTRACTOR does not complete the WORK within the specified permit window, the CONTRACTOR shall be responsible for the permit extension, and for completing any additional requirements placed upon the permit.

C. These Contract Documents may require that the WORK be performed within the conditions and/or requirements of local, state and/or federal permits. These permits may be bound within the Contract Documents, included within the Contract Documents by reference, or included as part of the WORK, as designated in Section 00700 – General Conditions, Article 6.6 - PERMITS. The CONTRACTOR is responsible for completing the WORK required for compliance with all permit requirements; this WORK is incidental to other items in the Contract Documents. Any reference to the "permittee" in the permits shall mean the CONTRACTOR. If any permits were acquired by the OWNER, this action was done to expedite the start of construction. If the CONTRACTOR does not complete the WORK within the specified permit window, the CONTRACTOR shall be responsible for the permit extension, and for completing any additional requirements placed upon the permit.

D. The OWNER shall apply for, and obtain, the necessary building permit for this project, however, the CONTRACTOR is responsible for scheduling and coordinating all necessary inspections. All other provisions of this Section remain in effect.

6.7 PATENT FEES AND ROYALTIES. The CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the WORK or the incorporation in the WORK of any invention, design, process, product, software or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the WORK and if to the actual knowledge of the OWNER or the ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by the OWNER in the Contract Documents. The CONTRACTOR shall indemnify, defend and hold harmless the OWNER and the ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses, and expenses (including attorneys' fees and court costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the WORK or resulting from the incorporation in the WORK of any invention, design, process, product, or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

6.8 LAWS AND REGULATIONS. The CONTRACTOR shall observe and comply with all federal, state, and local laws, ordinances, codes, orders, and regulations which in any manner affect those engaged or employed on the WORK, the materials used in the WORK, or the conduct of the WORK. If any discrepancy or inconsistency should be discovered in this contract in relation to any such law, ordinance, code, order, or regulation, the CONTRACTOR shall report the same in writing to the ENGINEER. The CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the ENGINEER, and their officers, agents, and employees against all claims or liability arising from violation of any such law, ordinance, code, order, or regulation, whether by CONTRACTOR or by its employees, Subcontractors, or third parties. Any particular law or regulation specified or referred to elsewhere in the Contract Documents shall not in any way limit the obligation of the CONTRACTOR to comply with all other provisions of federal, state, and local laws and regulations.

The OWNER may, per AS 36.30, audit the CONTRACTOR's or Subcontractor(s) records that are related to the cost or pricing data for this contract, all related Change Orders, and/or contract modifications.

6.9 TAXES. The CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by the CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the WORK.

6.10 USE OF PREMISES. The CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to (1) the Project site, (2) the land and areas identified in and permitted by the Contract Documents, and (3) the other land and areas permitted by Laws and Regulations, rights-of-way, permits, leases and easements. The CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the WORK. Should any claim be made against the OWNER or the ENGINEER by any such owner or occupant because of the performance of the WORK, the CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim through litigation. The CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify, defend, and hold the OWNER and the ENGINEER harmless from and against all claims, damages, losses, and expenses (including, but not limited to, fees of engineers attorneys, and other professionals and court costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any such owner or occupant against the OWNER, the ENGINEER, their Consultants, Sub-consultants, and the officers, directors, employees and agents of each and any of them to the extent caused by or based upon the CONTRACTOR's performance or non-performance of the WORK.

6.11 SAFETY AND PROTECTION

A. The CONTRACTOR shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all employees on the WORK and other persons and organizations who may be affected thereby;
2. all the WORK and materials and equipment to be incorporated therein, whether in storage on or off the site; and

3. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

B. The CONTRACTOR shall comply with all applicable Laws and Regulations whether referred to herein or not) of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the WORK may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. The CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and program.

D. Materials that contain hazardous substances or mixtures may be required on the WORK. A Material Safety Data Sheet shall be requested by the CONTRACTOR from the manufacturer of any hazardous product used.

E. Material usage shall be accomplished with strict adherence to all safety requirements and all manufacturer's warnings and application instructions listed on the Material Safety Data Sheet and on the product container label.

F. The CONTRACTOR shall be responsible for coordinating communications on any exchange of Material Safety Data Sheets or other hazardous material information that is required to be made available to, or exchanged between, or among, employers at the site in accordance with Laws or Regulations.

G. The CONTRACTOR shall notify the ENGINEER if it considers a specified product or its intended usage to be unsafe. This notification must be given to the ENGINEER prior to the product being ordered, or if provided by some other party, prior to the product being incorporated in the WORK.

6.12 SHOP DRAWINGS AND SAMPLES

A. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the ENGINEER for review, all Shop Drawings in accordance with Section 01300 - Contractor Submittals in the General Requirements.

B. The Contractor shall also submit to the ENGINEER for review all samples in accordance with Section 01300 - Contractor Submittals in the General Requirements.

C. Before submittal of each shop drawing or sample, the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the WORK and the Contract Documents.

6.13 CONTINUING THE WORK. The CONTRACTOR shall carry on the WORK and adhere to the progress schedule during all disputes or disagreements with the OWNER. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the CONTRACTOR and the OWNER may otherwise agree in writing.

6.14 INDEMNIFICATION

A. To the fullest extent permitted by the laws of the State of Alaska, the CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the ENGINEER, their Consultants, Sub-consultants and the officers, assembly members, mayor, directors, employees, and agents of each and any of them, against and from all claims, actions, damages, and liability of any kind and any nature arising out of or related to in way any acts or omissions of the CONTRACTOR, including death, and including in any administrative action by any federal or state agency, except where the claim or action alleges willful misconduct of the OWNER and the ENGINEER. Such indemnification by the CONTRACTOR shall include but not be limited to the following:

1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR, its employees, or agents in the performance of the WORK, or non-performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR, its employees, agents, or third parties;
2. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the CONTRACTOR's or Subcontractor's own employees engaged in the WORK resulting in actions brought by or on behalf of such employees against the OWNER, and the ENGINEER;
3. Liability or claims arising directly or indirectly from or based on the violation of any federal, state or local law, ordinance, regulation, order, or decree, whether by the CONTRACTOR, its employees, or agents;
4. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its employees, or agents in the performance of this contract of any copyrighted or non-copyrighted composition, secret process, patented or non-patented invention, computer software, article, or appliance, unless otherwise specifically stipulated in this contract.
5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the OWNER or any other parties by the CONTRACTOR, its employees, or agents;
6. Liabilities or claims arising directly or indirectly from the willful or criminal misconduct of the CONTRACTOR, its employees, or agents; and,
7. Liabilities or claims arising directly or indirectly from any breach of the obligations of the CONTRACTOR in the Agreement and all Contract documents.

B. The CONTRACTOR shall reimburse the ENGINEER and the OWNER for all costs and expenses, (including but not limited to fees and charges of engineers, attorneys, experts, and other professionals and court costs including all costs of appeals) incurred by the OWNER, and the ENGINEER in enforcing the provisions of this Paragraph 6.14.

C. The indemnification obligation under this Paragraph 6.14 shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any such Subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

6.15 CONTRACTOR'S DAILY REPORTS. The CONTRACTOR shall complete a daily report indicating total manpower for each construction trade, major equipment on site, each Subcontractor's manpower, weather conditions, etc., involved in the performance of the WORK. The daily report shall be completed on forms provided by the ENGINEER and shall be submitted to the ENGINEER at the conclusion of each workday. The report should comment on the daily progress and status of the WORK within each major component of the WORK. These components will be decided by the ENGINEER.

6.16 ASSIGNMENT OF CONTRACT. The CONTRACTOR shall not assign, sublet, sell, transfer, or otherwise dispose of the contract or any portion thereof, or its right, title, or interest therein, or obligations thereunder, without the written consent of the OWNER except as imposed by law. If the CONTRACTOR violates this provision, the contract may be terminated at the sole option of the OWNER. In such event, the OWNER shall be relieved of all liability and obligations to the CONTRACTOR and to its assignee or transferee, growing out of such termination.

6.17 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES. It is understood that any turn-on or turn-off, line locates and any other work or assistance necessary by the OWNER, will be at the CONTRACTOR's expense unless otherwise stated in the bid documents. All cost must be agreed to prior to any related actions and will be considered incidental to the project cost. Billing to the CONTRACTOR will be direct from the OWNER.

6.18 OPERATING WATER SYSTEM VALVES

A. The CONTRACTOR shall submit a written request, to the ENGINEER, for approval to operate any valve on any in-service section of the City water system. The request must be submitted at least 24-hours prior to operating any valves. The request shall specifically identify each valve to be operated, the time of operation, and the operation to be performed. The CONTRACTOR shall obtain the written approval of the ENGINEER for any scheduled operation before operating any valve.

B. The CONTRACTOR shall be responsible for all damages, both direct and consequential, to the OWNER or any other party, caused by unauthorized operation of any valve of the City water system.

6.19 CONTRACTOR'S WORK SCHEDULE LIMITATIONS. City and Borough of Wrangell Noise Ordinance. The noise loudness measured at the boundary line of the premises used for industrial activities shall not exceed 90 decibels between the hours of 7:00 AM and 8:00 PM on weekdays and the hours of 10:00 AM and 8:00 PM on weekends and holidays, and 40 decibels at other hours, unless a permit shall first be obtained from the OWNER. Such permit shall be issued by the OWNER only upon a determination that such operation during hours not otherwise permitted hereunder is necessary and will not result in unreasonable disturbance to surrounding residents.

ARTICLE 7 OTHER WORK

7.1 RELATED WORK AT SITE

A. The OWNER may perform other work related to the Project at the site by the OWNER's own forces, have other work performed by utility owners, or let other direct contracts therefor which may contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work.

B. The CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (or the OWNER, if the OWNER is performing the additional work with the OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the WORK with theirs. The CONTRACTOR shall do all cutting, fitting, and patching of the WORK that may be required to make its several parts come together properly and integrate with such other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of the ENGINEER and the others whose work will be affected.

C. If the proper execution or results of any part of the CONTRACTOR's WORK depends upon the work of any such other contractor or utility owner (or OWNER), the CONTRACTOR shall inspect and report to the ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for such proper execution and results. The CONTRACTOR's failure to report such delays, defects, or deficiencies will constitute an acceptance of the other work as fit and proper for integration with the CONTRACTOR's WORK except for latent or nonapparent defects and deficiencies in the other work.

7.2 COORDINATION. If the OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary General Conditions, and the specific matters to be covered by such authority and responsibility will be itemized and the extent of such authority and responsibilities will be provided in the Supplementary General Conditions.

ARTICLE 8 OWNER'S RESPONSIBILITIES

8.1 COMMUNICATIONS

A. The OWNER shall issue all its communications to the CONTRACTOR through the ENGINEER.

B. The CONTRACTOR shall issue all its communications to the OWNER through the ENGINEER.

8.2 PAYMENTS. The OWNER shall make payments to the CONTRACTOR as provided in Paragraphs 14.5, 14.8, 14.9 and 14.10.

8.3 LANDS, EASEMENTS, AND SURVEYS. The OWNER's duties in respect of providing lands and easements and providing surveys to establish reference points are set forth in Paragraphs 4.1 and 4.5.

8.4 CHANGE ORDERS. The OWNER shall execute Change Orders as indicated in Paragraph 10.1F.

8.5 INSPECTIONS AND TESTS. The OWNER's responsibility in respect of inspections, tests, and approvals is set forth in Paragraph 13.3.

8.6 SUSPENSION OF WORK. In connection with the OWNER's right to stop WORK or suspend WORK, see Paragraphs 13.4 and 15.1.

8.7 TERMINATION OF AGREEMENT. Paragraphs 15.2 and 15.3 detail the OWNER's right to terminate services of the CONTRACTOR.

ARTICLE 9 ENGINEER'S STATUS DURING CONSTRUCTION

9.1 OWNER'S REPRESENTATIVE. The ENGINEER will be the OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of the ENGINEER as the OWNER's representative during construction are set forth in the Contract Documents.

9.2 VISITS TO SITE. The ENGINEER will make visits to the site during construction to observe the progress and quality of the WORK and to determine, in general, if the WORK is proceeding in accordance with the Contract Documents. Exhaustive or continuous on-site inspections to check the quality or quantity of the WORK will not be required of the ENGINEER. The ENGINEER will not, during such visits, or as a result of such observations of the CONTRACTOR's WORK in progress, supervise, direct, or have control over the CONTRACTOR's WORK.

9.3 PROJECT REPRESENTATION. The ENGINEER may furnish an Inspector to assist in observing the performance of the WORK. The duties, responsibilities, and limitations of authority are as follows:

A. Duties, Responsibilities and Limitations of Authority of Inspector

General. The Inspector, who is the ENGINEER's Agent, will act as directed by and under the supervision of the ENGINEER and will confer with the ENGINEER regarding its actions. The Inspector's dealings in matters pertaining to the on-site WORK shall, in general, be only with the ENGINEER and the CONTRACTOR, and dealings with Subcontractors shall only be through or with the full knowledge of the CONTRACTOR. Written communication with the OWNER will be only through or as directed by the ENGINEER.

Duties and Responsibilities. The Inspector will:

1. Review the progress schedule, list of Shop Drawing submittals and schedule of values prepared by the CONTRACTOR and consult with the ENGINEER concerning their acceptability.

2. Attend pre-construction conferences. Arrange a schedule of progress meetings and other job conferences as required in consultation with the ENGINEER and notify those expected to attend in advance. Attend meetings and maintain and circulate copies of minutes thereof.
3. Serve as the ENGINEER's liaison with the CONTRACTOR, working principally through the CONTRACTOR's superintendent and assist said superintendent in understanding the intent of the Contract Documents. Assist the ENGINEER in serving as the OWNER's liaison with the CONTRACTOR when the CONTRACTOR's operations affect the OWNER's on-site operations.
4. As requested by the ENGINEER, assist in obtaining from the OWNER additional details or information, when required at the site for proper execution of the WORK.
5. Receive and record date of receipt of Shop Drawings and samples, receive samples which are furnished at the site by the CONTRACTOR and notify the ENGINEER of their availability for examination.
6. Conduct on-site observations of the WORK in progress to assist the ENGINEER in determining if the WORK is proceeding in accordance with the Contract Documents.
7. Report to the ENGINEER whenever the Inspector believes that any WORK is unsatisfactory, faulty, or defective or does not conform to the Contract Documents, or does not meet the requirements of any inspection, tests or approval required to be made or has been damaged prior to final payment; and advise the ENGINEER when the Inspector believes WORK should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection, or approval.
8. Verify that the tests, equipment, and systems startups and operating and maintenance instruction are conducted as required by the Contract Documents and in presence of the required personnel, and that the CONTRACTOR maintains adequate records thereof; observe, record and report to the ENGINEER appropriate details relative to the test procedures and start-ups.
9. Accompany visiting inspectors representing public or other agencies having jurisdiction over the WORK, record the outcome of these inspections, and report to the ENGINEER.
10. Transmit to the CONTRACTOR the ENGINEER's clarifications and interpretations of the Contract Documents.
11. Consider and evaluate the CONTRACTOR's suggestions for modifications in the Contract Documents and report them with recommendations to the ENGINEER.
12. Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and sample submittals, reproductions of original Contract Documents including all addenda, Change Orders, field orders, additional Drawings issued subsequent to the execution of the contract, the ENGINEER's clarifications and interpretations of the Contract Documents, progress reports, and other related documents.
13. Keep a diary or log book, recording hours on the job site, weather conditions, data relative to questions of extras or deductions, list all project visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of performing and observing test procedures. Send copies to the ENGINEER.
14. Record names, addresses, and telephone numbers of the CONTRACTOR, Subcontractors, and major suppliers of materials and equipment.
15. Furnish the ENGINEER with periodic reports as required of progress of the WORK and the CONTRACTOR's compliance with the accepted progress schedule and schedule of CONTRACTOR submittals.

16. Consult with the ENGINEER in advance of scheduled major tests, inspections, or start of important phases of the WORK.
17. Report immediately to the ENGINEER upon the occurrence of any accident.
18. Review applications for payment with the CONTRACTOR for compliance with the established procedure for their submittal and forward them with recommendations to the ENGINEER, noting particularly their relation to the schedule of values, WORK completed, and materials and equipment delivered at the site but not incorporated in the WORK.
19. During the course of the WORK, verify that certificates, maintenance and operation manuals, and other data required to be assembled and furnished by the CONTRACTOR are applicable to the items actually installed; and deliver this material to the ENGINEER for its review and forwarding to the OWNER prior to final acceptance of the WORK.
20. Before the ENGINEER prepares a Certificate of Substantial Completion/Notice of completion, as applicable, review the CONTRACTOR's punch list items requiring completion or correction and add any items that CONTRACTOR has omitted.
21. Conduct final inspection in the company of the ENGINEER, the OWNER, and the CONTRACTOR, and prepare a final punch list of items to be completed or corrected.
22. Verify that all items on the punch list have been completed or corrected and make recommendations to the ENGINEER concerning acceptance.

Limitations of Authority. Except upon written instruction of the ENGINEER, the Inspector:

1. Shall not authorize any deviation from the Contract Documents or approve any substitute material or equipment.
2. Shall not exceed limitations on the ENGINEER's authority as set forth in the Contract Documents.
3. Shall not undertake any of the responsibilities of the CONTRACTOR, Subcontractors or CONTRACTOR's superintendent, or expedite the WORK.
4. Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences, or procedures of construction unless such is specifically called for in the Contract Documents.
5. Shall not advise on or issue directions as to safety precautions and programs in connection with the WORK.

9.4 CLARIFICATIONS AND INTERPRETATIONS. The ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as the ENGINEER may determine necessary, which shall be consistent with, or reasonably inferred from, the overall intent of the Contract Documents.

9.5 AUTHORIZED VARIATIONS IN WORK. The ENGINEER may authorize variations in the WORK from the requirements of the Contract Documents. These may be accomplished by a Field Order and will require the CONTRACTOR to perform the WORK involved in a manner that minimizes the impact to the WORK and the contract completion date. If the CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time, the CONTRACTOR may make a claim therefor as provided in Article 11 or 12.

9.6 REJECTING DEFECTIVE WORK. The ENGINEER will have authority to reject WORK which the ENGINEER believes to be defective and will also have authority to require special inspection or testing of the WORK as provided in Paragraph 13.3G, whether or not the WORK is fabricated, installed, or completed.

9.7 CONTRACTOR SUBMITTALS, CHANGE ORDERS, AND PAYMENTS

A. In accordance with the procedures set forth in the General Requirements, the ENGINEER will review all CONTRACTOR submittals, including Shop Drawings, samples, substitutes, or "or equal" items, etc., in order to determine if the items covered by the submittals will, after installation or incorporation in the WORK, conform to the requirements of the Contract Documents and be compatible with the design concept of the completed project as a functioning whole as indicated by the Contract Documents. The ENGINEER's review will not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto.

B. In connection with the ENGINEER's responsibilities as to Change Orders, see Articles 10, 11, and 12.

C. In connection with the ENGINEER's responsibilities in respect of Applications for Payment, see Article 14.

9.8 DECISIONS ON DISPUTES

A. The ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the WORK thereunder. Claims, disputes, and other matters relating to the acceptability of the WORK; the interpretation of the requirements of the Contract Documents pertaining to the performance of the WORK; and those claims under Articles 11 and 12 in respect to changes in the Contract Price or Contract Time will be referred initially to the ENGINEER in writing with a request for formal decision in accordance with this paragraph, which the ENGINEER will render in writing within 30 days of receipt of the request. Written notice of each such claim, dispute, and other matter will be delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 30 days) after the occurrence of the event giving rise thereto. Written supporting data will be submitted to the ENGINEER within 60 days after such occurrence unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim. The failure of the CONTRACTOR to provide all supporting documentation for the claim shall result in the denial of the claim and the waiver of the claim by the CONTRACTOR.

B. The rendering of a decision by the ENGINEER with respect to any such claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 14.12) will be a condition precedent to any exercise by the OWNER or the CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Law or Regulations in respect of any such claim, dispute, or other matter.

9.9 LIMITATION ON ENGINEER'S RESPONSIBILITIES

A. Neither the ENGINEER's authority to act under this Article or other provisions of the Contract Documents nor any decision made by the ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the ENGINEER to the CONTRACTOR, any Subcontractor, any Supplier, any surety for any of them, or any other person or organization performing any of the WORK.

B. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as reviewed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of the ENGINEER as to the WORK, it is intended that such requirement, direction, review, or judgment will be solely to evaluate the WORK for compliance with the requirements of the Contract Documents, and conformance with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, unless there is a specific statement indicating otherwise. The use of any such term or adjective shall not be effective to assign to the ENGINEER any duty or authority to supervise or direct the performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9C or 9.9D.

C. The ENGINEER will not supervise, direct, control, or have authority over or be responsible for the CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the CONTRACTOR to comply with Laws and Regulations, applicable to the performance of the WORK. The ENGINEER will not be responsible for the CONTRACTOR's failure to perform the WORK in accordance with the Contract Documents, except where the failure of the CONTRACTOR is the result of negligent acts or omissions of the ENGINEER in the ENGINEER's performance of its obligations.

D. The ENGINEER will not be responsible for the acts or omissions of the CONTRACTOR nor of any Subcontractor, supplier, or any other person or organization performing any of the WORK.

ARTICLE 10 CHANGES IN THE WORK

10.1 GENERAL

A. Without invalidating the Agreement and without notice to any surety, the OWNER may at any time or from time to time, order additions, deletions, or revisions in the WORK; these will be authorized by a written Field Order and/or a Change Order issued by the ENGINEER.

B. If the CONTRACTOR believes that it is entitled to an increase or decrease in the Contract Price, or an extension or shortening in the Contract Time as the result of a Field Order, a claim may be made as provided in Articles 11 and 12.

C. If the OWNER and CONTRACTOR agree on the value of any work, or the amount of Contract Time that should be allowed as a result of a Field Order, upon receiving written

notice from the ENGINEER, the CONTRACTOR shall proceed so as to minimize the impact on and delays to the work pending the issuance of a Change Order.

D. If the OWNER and the CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Field Order, the ENGINEER can direct the CONTRACTOR to proceed on the basis of Time and Materials so as to minimize the impact on and delays to WORK, and a claim may be made therefor as provided in Articles 11 and 12.

E. The CONTRACTOR shall not be entitled to an increase in the Contract Price nor an extension of the Contract Time with respect to any work performed that is not required by the Contract Documents as amended, modified, supplemented by Change Order, except in the case of an emergency and except in the case of uncovering work as provided in Paragraph 13.3G.

F. The OWNER and the CONTRACTOR shall execute appropriate Change Orders covering:

1. changes in the WORK which are ordered by the OWNER pursuant to Paragraph 10.1A;
2. changes required because of acceptance of Defective WORK under Paragraph 13.7;
3. changes in the Contract Price or Contract Time which are agreed to by the parties; or
4. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by the ENGINEER pursuant to Paragraph 9.8.

G. If notice of any change is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be the CONTRACTOR's responsibility, and the amount of each applicable Bond shall be adjusted accordingly.

10.2 ALLOWABLE QUANTITY VARIATIONS

A. In the event of an increase or decrease in Bid item quantity of a unit price contract, the total amount of WORK actually done or materials or equipment furnished shall be paid for according to the unit bid price established for such WORK under the Contract Documents, wherever such unit price has been established; provided, that an adjustment in the Contract Price may be made for changes which result in an increase or decrease in excess of 25% of the estimated quantity of any major item of the WORK. Major Item is defined as any bid item amount that is ten percent (10%) or more of the total contract amount.

B. In the event a part of the WORK is to be entirely eliminated and no lump sum or unit price is named in the Contract Documents to cover such eliminated work, the price of the eliminated work shall be agreed upon in writing by the OWNER and the CONTRACTOR. If the OWNER and the CONTRACTOR fail to agree upon the price of the eliminated work, the price shall be determined in accordance with the provisions of Article 11.

ARTICLE 11 CHANGE OF CONTRACT PRICE

11.1 GENERAL

A. The Contract Price constitutes the total compensation payable to the CONTRACTOR for performing the WORK. All duties, responsibilities, and obligations assigned to or undertaken by the CONTRACTOR to complete the WORK shall be at its expense without change in the Contract Price.

B. The Contract Price may only be changed by a Change Order approved by the Borough Assembly. Any claim for an increase in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 7 days) after the start of the occurrence or the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with all supporting documentation and data shall be delivered within 14 days after such occurrence (unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of the occurrence or event. All claims for adjustment in the Contract Price shall be determined by the ENGINEER in accordance with Paragraph 9.8A if the OWNER and the CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this Paragraph 11.1B.

C. The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

1. Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved. Unit prices not specified in the contract documents shall be determined by the unit price for that item or items in the CONTRACTOR'S bid.
2. By mutual acceptance of a lump sum, which may, but is not required to, include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.4.
3. On the basis of the cost of work (determined as provided in Paragraphs 11.3) plus a CONTRACTOR's fee for overhead and profit (determined as provided in Paragraph 11.4).

11.2 COSTS RELATING TO WEATHER. The CONTRACTOR shall have no claims against the OWNER for damages for any injury to WORK, materials, or equipment, resulting from the action of the elements. If, however, in the opinion of the ENGINEER, the CONTRACTOR has made all reasonable efforts to protect the materials, equipment and work, the CONTRACTOR may be granted a reasonable extension of Contract Time to make proper repairs, renewals, and replacements of the work, materials, or equipment.

11.3 COST OF WORK (BASED ON TIME AND MATERIALS)

A. General. The term "cost of work" means the sum of all costs actually and necessarily incurred and paid by the CONTRACTOR for labor, materials, and equipment in the proper performance of extra work. Except as otherwise may be agreed to in writing by the OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project; shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.5 EXCLUDED COSTS.

B. Labor. The costs of labor will be the actual cost for wages prevailing for each craft or type of workers performing the extra work at the time the extra work is done, plus employer payments of payroll taxes, worker's compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. Labor costs for equipment operators and helpers shall be paid only when such costs are not included in the invoice for equipment rental. The labor costs for forepersons shall be proportioned to all of their assigned work and only that applicable to extra work shall be paid. Non-direct labor costs including superintendence shall be considered part of the mark-up set out in paragraph 11.4.

C. Materials. The cost of materials reported shall be at invoice or lowest current price at which materials are locally available and delivered to the job in the quantities involved, plus the cost of freight, delivery and storage, subject to the following:

1. Trade discounts available to the purchaser shall be credited to the OWNER notwithstanding the fact that such discounts may not have been taken by the CONTRACTOR.
2. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the ENGINEER. Mark-up except for actual costs incurred in the handling of such materials will not be allowed.
3. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on extra work items or the current wholesale price for such materials delivered to the work site, whichever price is lower.
4. If in the opinion of the ENGINEER the cost of material is excessive, or the CONTRACTOR does not furnish satisfactory evidence of the cost of such material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the work site less trade discount. The OWNER reserves the right to furnish materials for the extra work and no claim shall be allowed by the CONTRACTOR for costs and profit on such materials.

D. Equipment. The CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the Supplementary General Conditions. Such rental rate will be used to compute payments for equipment whether the equipment is under the CONTRACTOR's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment shall be the rate resulting in the least total cost to the OWNER for the total period of use. If it is deemed necessary by the CONTRACTOR to use equipment not listed in the publication specified in the Supplementary General Conditions, an equitable rental rate for the equipment will be established by the ENGINEER. The CONTRACTOR may furnish cost data which might assist the ENGINEER in the establishment of the rental rate. The CONTRACTOR shall not be entitled for any rental rate for equipment the use of which would have necessary to provide the unit of work and which should have been included in the CONTRACTOR'S bid price for that unit of work.

1. All equipment shall, in the opinion of the ENGINEER, be in good working condition and suitable for the purpose for which the equipment is to be used.
2. Before construction equipment is used on the extra work, the CONTRACTOR shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the ENGINEER, in duplicate, a description of the equipment and its identifying number.
3. Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
4. Individual pieces of equipment or tools having a replacement value of $200 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.
5. Rental time will not be allowed while equipment is inoperative due to breakdowns.
6. Equipment Rental Rates. Unless otherwise agreed in writing, the CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the current edition of the following reference publication: "Rental Rate Blue Book" as published by Dataquest (a company of the Dunn and Bradstreet Corporation), 1290 Ridder Park Drive, San Jose, CA 95131, telephone number (800) 227-8444.

E. Equipment on the Work Site. The rental time to be paid for equipment on the work site shall be the time the equipment is in productive operation on the extra work being performed and, in addition, shall include the time required to move the equipment to the location of the extra work and return it to the original location or to another location requiring no more time than that required to return it to its original location; except, that moving time will not be paid if the equipment is used on other than the extra work, even though located at the site of the extra work, or if it was not necessary to move equipment from another location to the site. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made for loading and transporting costs when the equipment is used at the site of the extra work on other than the extra work. The following shall be used in computing the rental time of equipment on the work site.

1. When hourly rates are listed, any part of an hour less than 30 minutes of operation shall be considered to be 1/2-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation.
2. When daily rates are listed, any part of a day less than 4 hours operation shall be considered to be 1/2-day of operation. When owner-operated equipment is used to perform extra work to be paid for on a time and materials basis, the CONTRACTOR will be paid for the equipment and operator, as set forth in Paragraphs (3), (4), and (5), following.
3. Payment for the equipment will be made in accordance with the provisions in Paragraph 11.3D, herein.
4. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the CONTRACTOR to other workers operating similar equipment already on the work site, or in the absence of such labor, established by collective bargaining agreements for the type of worker and location of the extra work, whether or not the operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein in accordance with the provisions of Paragraph 11.3B, herein, which surcharge shall constitute full compensation for payments imposed by state and federal laws and all other payments made to or on behalf of workers other than actual wages.
5. To the direct cost of equipment rental and labor, computed as provided herein, will be added the allowances for equipment rental and labor as provided in Paragraph 11.4, herein.

F. Specialty Work. Specialty work is defined as that work characterized by extraordinary complexity, sophistication, or innovation or a combination of the foregoing attributes which are unique to the construction industry. The following shall apply in making estimates for payment for specialty work:

1. Any bid item of WORK to be classified as Specialty Work shall be listed as such in the Supplementary General Conditions. Specialty work shall be performed by an entity especially skilled in the work to be performed. After validation of invoices and determination of market values by the ENGINEER, invoices for specialty work based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental costs.
2. When the CONTRACTOR is required to perform work necessitating special fabrication or machining process in a fabrication or a machine shop facility away from the job site, the charges for that portion of the work performed at the off-site facility may, by agreement, be accepted as specialty work and accordingly, the invoices for the work may be accepted without detailed itemization.
3. All invoices for specialty work will be adjusted by deducting all trade discounts offered or available, whether the discounts were taken or not. In lieu of the allowances for overhead and profit specified in Paragraph 11.4, herein, an allowance of 5 percent will be added to invoices for specialty work.

G. Sureties. All work performed hereunder shall be subject to all of the provisions of the Contract Documents and the CONTRACTOR's sureties shall be bound with reference thereto as under the original Agreement. Copies of all amendments to surety bonds or supplemental surety bonds shall be submitted to the OWNER for review prior to the performance of any work hereunder.

11.4 CONTRACTOR'S FEE

A. Extra work ordered on the basis of time and materials will be paid for at the actual necessary cost as determined by the ENGINEER, plus allowances for overhead and profit. The allowance for overhead and profit shall include full compensation for superintendence, bond and insurance premiums, taxes, field office expense, extended overhead, home office overhead, and all other items of expense or cost not included in the cost of labor, materials, or equipment provided for under Paragraph 11.3. The allowance for overhead and profit will be made in accordance with the following schedule:

Actual Overhead and Profit Allowance	
Labor	15 percent
Materials	10 percent
Equipment	10 percent

To the sum of the costs and mark-ups provided for in this Article, one percent shall be added as compensation for bonding.

B. It is understood that labor, materials, and equipment may be furnished by the CONTRACTOR or by the Subcontractor on behalf of the CONTRACTOR. When all or any part of the extra work is performed by a Subcontractor, the allowance specified herein shall be applied to the labor, materials, and equipment costs of the Subcontractor, to which the CONTRACTOR may add 5 percent of the Subcontractor's total cost for the extra work. Regardless of the number of hierarchical tiers of Subcontractors, the 5 percent increase above the Subcontractor's total cost which includes the allowances for overhead and profit specified herein may be applied one time only.

11.5 EXCLUDED COSTS. The term Cost of the Work shall not include any of the following:

A. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, estimators, attorneys' auditors, accountants, purchasing and contracting agents, expenditures, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the work, or not specifically covered by paragraph 11.3, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

B. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

C. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

D. Cost of premiums for all bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by paragraph 11.4 above).

E. Costs due to the negligence of CONTRACTOR , any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective WORK, disposal of materials or equipment wrongly supplied and making good any damage to property.

F. Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in paragraph 11.4.

G. Equipment rental cost for equipment that would be needed to perform the unit of work as reflected in the bid price for that unit of work.

H. Mobilization or demobilization for equipment that would necessarily have been used to perform that unit of work as reflected in the bid price for that unit of work.

ARTICLE 12 CHANGE OF CONTRACT TIME

12.1 GENERAL

A. The Contract Time may only be changed by a Change Order. Any claim for an extension of the Contract Time (or Milestones) shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 30 days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 60 days after such occurrence (unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR'S written statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the ENGINEER in accordance with Paragraph 9.8 if the OWNER and the CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this Paragraph 12.1A. An increase in Contract Time does not mean that the Contractor is due an increase in Contract Price. Only Compensable time extensions will result in an increase in Contract Price.

B. All time limits stated in the Contract Documents are of the essence of the Agreement. OWNER reserves the right to direct CONTRACTOR to accelerate his work, at no cost to OWNER, if CONTRACTOR fails to maintain contract schedule.

C. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost on the critical path of the project due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, unprecedented weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

D. Where CONTRACTOR is prevented from completing any part of the WORK within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost on the critical path of the project due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay. In no event shall the OWNER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from (i) delays caused by or within the control of CONTRACTOR, or (ii) delays beyond the control of both parties including but not limited to fires, floods, epidemics abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

12.2 EXTENSIONS OF TIME FOR DELAY DUE TO WEATHER. Contract Time may be extended by the ENGINEER because of delays in completion of the WORK due to unusually severe weather, provided that the CONTRACTOR shall, within 10 days of the beginning of any such delay, notify the ENGINEER in writing of the cause of delay and request an extension of Contract Time. The ENGINEER will ascertain the facts and the extent of the delay and extend the time for completing the work when, in the ENGINEER's judgment, the findings of fact justify such an extension. Unprecedented, abnormal, or unusually severe weather will be defined as an event, or events, with a greater than 50-year recurrence interval, as determined by the National Weather Service, or equivalent State or Federal agency

ARTICLE 13 WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

13.1 WARRANTY AND GUARANTEE. The CONTRACTOR warrants and guarantees to the OWNER and the ENGINEER that all work will be in accordance with the Contract Documents and will not be defective. Prompt notice of defects known to the OWNER or ENGINEER shall be given to the CONTRACTOR. All defective work, whether or not in place, may be rejected, corrected, or accepted as provided in this Article 13.

13.2 ACCESS TO WORK. OWNER, ENGINEER, their Consultants, sub-consultants, other representatives and personnel of OWNER, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's site safety procedures and programs so that they may comply therewith as applicable.

13.3 TESTS AND INSPECTIONS

A. The CONTRACTOR shall give the ENGINEER timely notice of readiness of the WORK for all required inspections, tests, or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. If Laws or Regulations of any public body having jurisdiction other than the OWNER require any WORK to specifically be inspected, tested, or approved, the CONTRACTOR shall pay all costs in connection therewith. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the OWNER's or the ENGINEER's acceptance of a Supplier of materials or equipment proposed as a substitution or (or-equal) to be incorporated in the WORK, or of materials or equipment submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK. The cost of all inspections, tests, and approvals in addition to the above which are required by the Contract Documents shall be paid by the OWNER (unless otherwise specified).

C. The ENGINEER will make, or have made, such inspections and tests as the ENGINEER deems necessary to see that the WORK is being accomplished in accordance with the requirements of the Contract Documents. Unless otherwise specified in the Supplementary General Conditions, the cost of such inspection and testing will be borne by the OWNER. In the event such inspections or tests reveal non-compliance with the requirements of the Contract Documents, the CONTRACTOR shall bear the cost of corrective measures deemed necessary by the ENGINEER, as well as the cost of subsequent reinspection and retesting. Neither observations by the ENGINEER nor inspections, tests, or approvals by others shall relieve the CONTRACTOR from the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.

D. All inspections, tests, or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to the ENGINEER and the CONTRACTOR.

E. If any work (including the work of others) that is to be inspected, tested, or approved is covered without written concurrence of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the ENGINEER timely notice of the CONTRACTOR's intention to perform such test or to cover the same and the ENGINEER has not acted with reasonable promptness in response to such notice.

F. If any WORK is covered contrary to the written request of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for the ENGINEER's observation and recovered at the CONTRACTOR's expense.

G. If the ENGINEER considers it necessary or advisable that covered WORK be observed by the ENGINEER or inspected or tested by others, the CONTRACTOR, at the ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, material, and equipment. If it is found that such work is defective, the CONTRACTOR shall bear all direct, indirect, and consequential costs and damages of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction, including but not limited to fees and charges of engineers, attorneys, and other professionals. However, if such work is not found to be defective, the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction; and, if the

parties are unable to agree as to the amount or extent thereof, the CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

13.4 OWNER MAY STOP THE WORK. If the WORK is defective, or the CONTRACTOR fails to perform work in such a way that the completed WORK will conform to the Contract Documents, the OWNER may order the CONTRACTOR to stop the WORK, or any portion thereof, until the cause for such order has been eliminated; however, this right of the OWNER to stop the WORK shall not give rise to any duty on the part of the OWNER to exercise this right for the benefit of the CONTRACTOR or any other party.

13.5 CORRECTION OR REMOVAL OF DEFECTIVE WORK. If required by the ENGINEER, the CONTRACTOR shall promptly, either correct all defective work, whether or not fabricated, installed, or completed, or, if the WORK has been rejected by the ENGINEER, remove it from the site and replace it with non-defective work. The CONTRACTOR shall bear all direct, indirect and consequential costs and damages of such correction or removal, including but not limited to fees and charges of engineers, attorneys, and other professionals made necessary thereby.

13.6 ONE YEAR CORRECTION PERIOD

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any work is found to be defective, the CONTRACTOR shall promptly, without cost to the OWNER and in accordance with OWNER's written notification, (i) correct such Defective WORK, or, if it has been rejected by the OWNER, remove it from the site and replace it with non-defective work, and (ii) satisfactorily correct or remove and replace any damage to other work of others resulting therefrom. If the CONTRACTOR does not promptly comply with such notification, or in an emergency where delay would cause serious risk of loss or damage, the OWNER may have the Defective WORK corrected or the rejected WORK removed and replaced, and all direct, indirect, and consequential costs and damages of such removal and replacement including but not limited to fees and charges of engineers, attorneys and other professionals will be paid by the CONTRACTOR.

B. Where Defective WORK (and damage to other WORK resulting therefrom) has been corrected, removed or replaced under this paragraph 13.6, the correction period hereunder with respect to such WORK will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

13.7 ACCEPTANCE OF DEFECTIVE WORK. If, instead of requiring correction or removal and replacement of defective work, the OWNER prefers to accept the WORK, the OWNER may do so. The CONTRACTOR shall bear all direct, indirect, and consequential costs attributable to the OWNER's evaluation of and determination to accept such defective work. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK, and the OWNER shall be entitled to an appropriate decrease in the Contract Price.

ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 SCHEDULE OF VALUES (LUMP SUM PRICE BREAKDOWN). The schedule of values or lump sum price breakdown established as provided in the General Requirements shall serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the ENGINEER.

14.2 UNIT PRICE BID SCHEDULE. Progress payments on account of Unit Price work will be based on the number of units completed.

14.3 APPLICATION FOR PROGRESS PAYMENT

A. Unless otherwise prescribed by law, on the 25th of each month, the CONTRACTOR shall submit to the ENGINEER for review, an Application for Payment filled out and signed by the CONTRACTOR covering the WORK completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

B. The Application for Payment shall identify, as a sub-total, the amount of the CONTRACTOR'S Total Earnings to Date, plus the Value of Materials Stored at the Site which have not yet been incorporated in the WORK, and less a deductive adjustment for materials installed which were not previously incorporated in the WORK, but for which payment was allowed under the provisions for payment for Materials Stored at the Site, but not yet incorporated in the WORK.

C. Each Application for Payment shall be submitted with an updated Progress Schedule, as required in Section 01300 Contractor Submittals. Each Application for Payment will also be accompanied by Contractor and Subcontractor certified payroll reports for periods covered by the period covered by the Application for Payment.

D. The Net Payment Due the CONTRACTOR shall be the above-mentioned subtotal from which shall be deducted the total amount of all previous payments made to the CONTRACTOR. Progress payments will be paid in full in accordance with Article 14 of the General Conditions until 90% of the Contract Price has been paid. The remaining 10% of the Contract Price amount may be withheld until:

1. final inspection has been made;
2. completion of the project; and
3. acceptance of the project by the OWNER.

E. The Value of Materials Stored at the Site shall be an amount equal to the specified percent of the value of such materials as set forth in the Supplementary General Conditions. Said amount shall be based upon the value of all acceptable materials and equipment not incorporated in the WORK but delivered and suitably stored at the site or at another location agreed to in writing; provided, each such individual item has a value of more than $5,000.00 and will become a permanent part of the WORK. The Application for Payment shall also be accompanied by an invoice (including shipping), a certification that the materials meet the applicable contract specifications, and any evidence required by the OWNER that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the OWNER's interest therein, all of which will be satisfactory to the OWNER. Payment for materials will not constitute final acceptance. It shall be the CONTRACTOR's responsibility to protect the

material from damage, theft, loss, or peril while in storage. Unless otherwise prescribed by law, the Value of Materials Stored at the Site shall be paid at the invoice amount up to a maximum of 85% of the Contract Price for those items.

14.4 CONTRACTOR'S WARRANTY OF TITLE. The CONTRACTOR warrants and guarantees that title to all work, materials, and equipment covered by an Application for Payment, whether incorporated in the WORK or not, will pass to the OWNER no later than the time of payment free and clear of all liens.

14.5 REVIEW OF APPLICATIONS FOR PROGRESS PAYMENT

A. The ENGINEER will, within 7 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to the OWNER, or return the Application to the CONTRACTOR indicating in writing the ENGINEER's reasons for refusing to recommend payment. In the later case, the CONTRACTOR may make the necessary corrections and resubmit the Application, at which point the 7 days for ENGINEER review will begin again. If the ENGINEER still disagrees with a portion of the Application, it will submit the Application recommending the undisputed portion of the Application to the OWNER for payment and provide reasons for recommending non-payment of the disputed amount. Thirty days after presentation of the Application for Payment with the ENGINEER's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.5B) become due and when due will be paid by the OWNER to the CONTRACTOR.

B. The OWNER may refuse to make payment of the full amount recommended by the ENGINEER because claims have been made against the OWNER on account of the CONTRACTOR's performance of the WORK or Liens have been filed in connection with the WORK or there are other items entitling the OWNER to a credit against the amount recommended, but the OWNER must give the CONTRACTOR written notice within 7 days (with a copy to the ENGINEER) stating the reasons for such action.

14.6 PARTIAL UTILIZATION

A. The OWNER shall have the right to utilize or place into service any item of equipment or other usable portion of the WORK prior to completion of the WORK. Whenever the OWNER plans to exercise said right, the CONTRACTOR will be notified in writing by the OWNER, identifying the specific portion or portions of the WORK to be so utilized or otherwise placed into service.

B. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all of the WORK shall be borne by the CONTRACTOR. Upon issuance of said written notice of partial utilization, the OWNER will accept responsibility for the protection and maintenance of all such items or portions of the WORK described in the written notice.

C. The CONTRACTOR shall retain full responsibility for satisfactory completion of the WORK, regardless of whether a portion thereof has been partially utilized by the OWNER and the CONTRACTOR's one year correction period shall commence only after the date of Substantial Completion for the WORK.

14.7 SUBSTANTIAL COMPLETION. When the CONTRACTOR considers the WORK ready for its intended use the CONTRACTOR shall notify the OWNER and the ENGINEER in writing that the WORK is substantially complete. The CONTRACTOR will attach to this request a list of all work items that remain to be completed and a request that the ENGINEER prepare a Notice of Completion. Within a reasonable time thereafter, the OWNER, the CONTRACTOR, and the ENGINEER shall make an inspection of the WORK to determine the status of completion. If the ENGINEER does not consider the WORK substantially complete, or the list of remaining work items to be comprehensive, the ENGINEER will notify the CONTRACTOR in writing giving the reasons therefor. If the ENGINEER considers the WORK substantially complete, the ENGINEER will prepare and deliver to the OWNER, for its execution and recording, the Notice of Completion signed by the ENGINEER and CONTRACTOR, which shall fix the date of Substantial Completion.

14.8 FINAL APPLICATION FOR PAYMENT. After the CONTRACTOR has completed all of the remaining work items referred to in Paragraph 14.7 and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, contract releases, record as-built documents (as provided in the General Requirements) and other documents, all as required by the Contract Documents, and after the ENGINEER has indicated that the WORK is acceptable, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the OWNER) of all liens arising out of or filed in connection with the WORK.

14.9 FINAL PAYMENT AND ACCEPTANCE

A. If, on the basis of the ENGINEER's observation of the WORK during construction and final inspection, and the ENGINEER's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, the ENGINEER is satisfied that the WORK has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ENGINEER will, within 14 days after receipt of the final Application for Payment, indicate in writing the ENGINEER's recommendation of payment and present the Application to the OWNER for payment.

B. After acceptance of the WORK by the OWNER's governing body, the OWNER will make final payment to the CONTRACTOR of the amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract Documents, including the following items:

1. Liquidated damages, as applicable.
2. Two times the value of outstanding items of correction work or punch list items yet uncompleted or uncorrected, as applicable. All such work shall be completed or corrected to the satisfaction of the OWNER within the time stated on the Notice of Completion, otherwise the CONTRACTOR does hereby waive any and all claims to all monies withheld by the OWNER to cover the value of all such uncompleted or uncorrected items.

14.10 RELEASE OF RETAINAGE AND OTHER DEDUCTIONS

A. After executing the necessary documents to initiate the lien period, and not more than 45 days thereafter (based on a 30-day lien filing period and 15-day processing time), the OWNER will release to the CONTRACTOR the retainage funds withheld pursuant to the Agreement, less any deductions to cover pending claims against the OWNER pursuant to Paragraph 14.5B.

B. After filing of the necessary documents to initiate the lien period, the CONTRACTOR shall have 30 days to complete any outstanding items of correction work remaining to be completed or corrected as listed on a final punch list made a part of the Notice of Completion. Upon expiration of the 45 days, referred to in Paragraph 14.10A, the amounts withheld pursuant to the provisions of Paragraph 14.9B herein, for all remaining work items will be returned to the CONTRACTOR; provided, that said work has been completed or corrected to the satisfaction of the OWNER within said 30 days. Otherwise, the CONTRACTOR does hereby waive any and all claims for all monies withheld by the OWNER under the Contract to cover 2 times the value of such remaining uncompleted or uncorrected items.

14.11 CONTRACTOR'S CONTINUING OBLIGATION. The CONTRACTOR's obligation to perform and complete the WORK in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by the ENGINEER, nor the issuance of a Notice of Completion, nor any payment by the OWNER to the CONTRACTOR under the Contract Documents, nor any use or occupancy of the WORK or any part thereof by the OWNER, nor any act of acceptance by the OWNER nor any failure to do so, nor any review of a Shop Drawing or sample submittal, will constitute an acceptance of work not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.

14.12 FINAL PAYMENT TERMINATES LIABILITY OF OWNER. Final payment is defined as the last progress payment made to the CONTRACTOR for earned funds, less monies withheld as applicable, pursuant to Paragraph 14.10A. The acceptance by the CONTRACTOR of the final payment referred to in Paragraph 14.9 herein, shall be a release of the OWNER and its agents from all claims of liability to the CONTRACTOR for anything done or furnished for, or relating to, the WORK or for any act of neglect of the OWNER or of any person relating to or affecting the WORK, except demands against the OWNER for the remainder, if any, of the amounts kept or retained under the provisions of Paragraph 14.9 herein; and excepting pending, unresolved claims filed prior to the date of the Notice of Completion.

ARTICLE 15 SUSPENSION OF WORK AND TERMINATION

15.1 SUSPENSION OF WORK BY OWNER. The OWNER, acting through the ENGINEER, may, at any time and without cause, suspend the WORK or any portion thereof for a period of not more than 90 days by notice in writing to the CONTRACTOR. The CONTRACTOR shall resume the WORK on receipt from the ENGINEER of a notice of resumption of work. The CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if the CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

15.2 TERMINATION OF AGREEMENT BY OWNER (CONTRACTOR DEFAULT)

A. In the event of default by the CONTRACTOR, the OWNER may give 10 days written notice to the CONTRACTOR of OWNER's intent to terminate the Agreement and provide the CONTRACTOR an opportunity to remedy the conditions constituting the default. It shall be considered a default by the CONTRACTOR whenever CONTRACTOR shall: (1) declare bankruptcy, become insolvent, or assign its assets for the benefit of its creditors; (2) fail to provide materials or quality of work meeting the requirements of the Contract Documents; (3) disregard or violate provisions of the Contract Documents or ENGINEER's instructions; (4) fail to prosecute the WORK according to the approved progress schedule; or, (5) fail to provide a qualified superintendent, competent workers, or materials or equipment meeting the requirements of the Contract Documents; or 5) breach any of the material terms of the Agreement or the Contract documents. If the CONTRACTOR fails to remedy the conditions constituting default within the time allowed, the OWNER may then issue the Notice of Termination.

B. In the event the Agreement is terminated in accordance with Paragraph 15.2A, herein, the OWNER may take possession of the WORK and may complete the WORK by whatever method or means the OWNER may select. The cost of completing the WORK shall be deducted from the balance which would have been due the CONTRACTOR had the Agreement not been terminated and the WORK completed in accordance with the Contract Documents. If such cost exceeds the balance which would have been due, the CONTRACTOR shall pay the excess amount to the OWNER. If such cost is less than the balance which would have been due, the CONTRACTOR shall not have claim to the difference.

15.3 TERMINATION OF AGREEMENT BY OWNER (FOR CONVENIENCE). The OWNER may terminate the Agreement at any time in its sole discretion in the best interests of the City and Borough of Wrangell. In such a case, the CONTRACTOR shall have no claims against the OWNER except: (1) for the value of work performed up to the date the Agreement is terminated, which shall be based on the CONTRACTOR'S bid price for all units of work performed and in no circumstances shall exceed the bid price for each unit of work actually performed; and, (2) for the cost of materials and equipment on hand, in transit, or on definite commitment, as of the date the Agreement is terminated which would be needed in the WORK and which meet the requirements of the Contract Documents. The value of work performed and the cost of materials and equipment delivered to the site, as mentioned above, shall be determined by the ENGINEER in accordance with the procedure prescribed for the making of the final application for payment and payment under Paragraphs 14.8 and 14.9.

15.4 TERMINATION OF AGREEMENT BY CONTRACTOR. The CONTRACTOR may terminate the Agreement upon 10 days written notice to the OWNER, whenever: 1) the WORK has been suspended under the provisions of Paragraph 15.1, herein, for more than 90 consecutive days through no fault or negligence of the CONTRACTOR, and notice to resume work or to terminate the Agreement has not been received from the OWNER within this time period; or, 2) the OWNER should fail to pay the CONTRACTOR any monies due him as approved for payment by the ENGINEER in accordance with the terms of the Contract Documents and within 60 days after presentation to the OWNER by the CONTRACTOR of a request therefor, unless within the 10-day period the OWNER shall have remedied the condition upon which the payment delay was based. In the event of such termination, the CONTRACTOR shall have no claims against the OWNER except for those claims specifically enumerated in Paragraph 15.3, herein, and as determined in accordance with the requirements of that paragraph.

ARTICLE 16 MISCELLANEOUS

16.1 GIVING NOTICE. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice. E-mail shall not constitute written notice.

16.2 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

A. The CONTRACTOR may use on the Project, with ENGINEER's approval, such stone, gravel, sand, or other material determined suitable by the ENGINEER, as may be found in the excavation. The CONTRACTOR will be paid for the excavation of such material at the corresponding contract unit price. No additional payment will be made for utilizing the material from excavation as borrow or select borrow.

B. The CONTRACTOR shall replace, at its own expense, with other acceptable material, all of that portion of the excavated material so removed and used which was needed for use on the project. No charge for the materials so used will be made against the CONTRACTOR except that the CONTRACTOR shall be responsible for payment of any royalties required.

C. The CONTRACTOR shall not excavate or remove any material from within the Project location which is not within the grading limits, as indicated by the slope and grade lines, without written authorization from the ENGINEER.

D. In the event the CONTRACTOR has processed materials from OWNER-furnished sources in excess of the quantities required for performance of this contract, including any waste material produced as a by-product, the OWNER may retain possession of such materials without obligation to reimburse the CONTRACTOR for the cost of their production. When such materials are in a stockpile, the ENGINEER may require: That it remain in stockpile; the CONTRACTOR level such stockpile(s); or that the CONTRACTOR remove such materials and restore the premises to a satisfactory condition at the CONTRACTOR's expense. This provision shall not preclude the OWNER from arranging with the CONTRACTOR to produce material over and above the contract needs, payment for which shall be by written agreement between the OWNER and the CONTRACTOR.

E. Unless otherwise provided, the material from any existing old structure may be used temporarily by the CONTRACTOR in the erection of the new structure. Such material shall not be cut or otherwise damaged except with the approval of the ENGINEER.

16.3 RIGHT TO AUDIT. If the CONTRACTOR submits a claim to the OWNER for additional compensation, the OWNER shall have the right, as a condition to considering the claim, and as a basis for evaluation of the claim, and until the claim has been settled, to audit the CONTRACTOR's books to the extent they are relevant. This right shall include the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to discover and verify all direct and indirect costs of whatever nature claimed to have been incurred or anticipated to be incurred and for which the claim has been submitted. The right to audit shall include the right to inspect the CONTRACTOR's plants, or such parts thereof, as may be or have been engaged in the performance of the WORK. The CONTRACTOR further agrees that the right to audit encompasses all subcontracts and is binding upon Subcontractors. The rights to examine and inspect herein provided for shall be exercisable through such representatives as the OWNER deems desirable during the CONTRACTOR's normal business hours at the office of the CONTRACTOR. The CONTRACTOR shall make available to the OWNER for auditing, all relevant accounting records and documents, and other financial data, and upon request, shall submit true copies of requested records to the OWNER.

16.4 ARCHAEOLOGICAL OR HISTORICAL DISCOVERIES. When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, paleontological remains, such as shell heaps, land or sea mammal bones or tusks, or other items of historical significance, the CONTRACTOR shall cease operations immediately and notify the ENGINEER. No artifacts or specimens shall be further disturbed or removed from the ground and no further operations shall be performed at the site until so directed. Should the ENGINEER order suspension of the CONTRACTOR's operations in order to protect an archaeological or historical finding, or order the CONTRACTOR to perform extra work, such order(s) shall be covered by an appropriate contract change document.

16.5 CONSTRUCTION OVER OR ADJACENT TO NAVIGABLE WATERS. All work over, on, or adjacent to navigable waters shall be so conducted that free navigation of the waterways will not be interfered with and the existing navigable depths will not be impaired, except as allowed by permit issued the U.S. Coast Guard and/or the U.S. Army Corps of Engineers, as applicable.

16.6 GRATUITY AND CONFLICT OF INTEREST. The CONTRACTOR agrees to not extend any loan, gratuity, or gift of money of any form whatsoever to any employee or elected official of the OWNER.

16.7 SUITS OF LAW CONCERNING THE WORK

A. The Superior Court for the State of Alaska, First Judicial District at Wrangell, Alaska, shall be the exclusive jurisdiction and venue for any action of any kind an any nature arising out of or relating to this Agreement and all Contract documents or for any action of any kind and any nature arising out of or related to the performance of non-performance of the CONTRATOR, and CONTRACTOR'S employees, subcontractors, consultants and representatives.

B. If one of the questions at issue is the satisfactory performance of the work by the CONTRACTOR and should the appropriate court of law judge the work of the CONTRACTOR to be unsatisfactory, then the CONTRACTOR (or the CONTRACTOR's surety) shall reimburse the OWNER for all legal and all other expenses (as may be allowed and set by the court) incurred by the OWNER because of the suit of the law and, further, it is agreed that the OWNER may deduct such expense

from any sum or sums then, or any that become due the CONTRACTOR under the contract.

16.8 CERTIFIED PAYROLLS

A. All CONTRACTORs or Subcontractor who perform work on a public construction contract for the OWNER shall file a certified payroll with the Alaska Department of Labor before Friday of each week that covers the preceding week (Section 14-2-4 ACLA 1949; am Section 4 ch 142 SLA 1972).

B. In lieu of submitting the State payroll form, the CONTRACTOR's standard payroll form may be submitted, provided it contains the information required by AS 36.05.040 and a statement that the CONTRACTOR is complying with AS 36.10.010.

C. A CONTRACTOR or Subcontractor, who performs work on public construction in the State, as defined by AS 36.95.010(3), shall pay not less than the current prevailing rate of wages as issued by the Alaska Department of Labor before the end of the pay period. (AS 36.05.010).

16.9 PREVAILING WAGE RATES

A. Wage rates for Laborers and Mechanics on Public Contracts, AS 36.05.070. The CONTRACTOR, or Subcontractors, shall pay all employees unconditionally and not less than once a week. Wages may not be less than those stated in Paragraph 16.8C, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors. The scale of wages to be paid shall be posted by the CONTRACTOR in a prominent, easily accessible place at the site of the WORK.

B. Failure to Pay Agreed Wages, AS 36.05.080. If it is found that a laborer, mechanic, or field surveyor employed by the CONTRACTOR or Subcontractor has been, or is being, paid a rate or wages less than the established rate, the OWNER may, by written notice, terminate the CONTRACTOR or Subcontractors right to proceed with the work. The OWNER may prosecute the work to completion by contract or otherwise, and the CONTRACTOR and sureties will be held liable to the OWNER for excess costs for completing the WORK. (Section 2 ch 52 SLA 1959).

F. Listing CONTRACTOR's Who Violate Contracts, AS 36.05.090. In addition, a list giving the names of persons who have disregarded the rights of their employees shall be distributed to all departments of State government and all political subdivisions. No person appearing on this list, and no firm, corporation, partnership or association in which the person has an interest, may work as a CONTRACTOR or Subcontractor on a public construction contract for the State, or a political subdivision of the state, until three years after the date of publication of the list. (Section 3 ch 52 SLA 1959; am Section 9 ch 142 SLA).

16.10 EMPLOYMENT REFERENCE. Workers employed in the execution of the contract by the CONTRACTOR or by any Subcontractor under this contract shall not be required or permitted to labor more than 8 hours a day or 40 hours per week in violation of the provisions of the Alaska Wage and Hour Act, Section 23.10.060.

16.11 COST REDUCTION INCENTIVE

A. At any time within 45 days after the date of the Notice of Award, the CONTRACTOR may submit to the ENGINEER in writing, proposals for modifying the plans, specifications, or other requirements of this contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair in any manner the essential functions or characteristics of the project, including but not limited to, service life, economy of operation, ease of maintenance, desired appearance or design and safety standards.

B. The cost reduction proposal shall contain the following information:

1. Description of both the existing contract requirements for performing the WORK and the proposed changes.
2. An itemization of the contract requirements that must be changed if the proposal is adopted.
3. A detailed estimate of the time required and the cost of performing the WORK under both the existing contract and the proposed change.
4. A statement of the date by which the CONTRACTOR must receive the decision from the OWNER on the cost reduction proposal.
5. The contract items of WORK affected by the proposed changes including any quantity variations.
6. A description and estimate of costs the OWNER may incur in implementing the proposed changes, such as test and evaluation and operating and support costs.
7. A prediction of any effects the proposed change would have on future operations and maintenance costs to the OWNER.

C. The provisions of this section shall not be construed to require the OWNER to consider any cost reduction proposal which may be submitted; nor will the OWNER be liable to the CONTRACTOR for failure to accept or act upon any cost reduction proposal submitted, or for delays to the work attributable to the consideration or implementation of any such proposal.

D. If a cost reduction proposal is similar to a change in the plans or specifications for the project under consideration by the OWNER at the time the proposal is submitted, the OWNER will not accept such proposal and reserves the right to make such changes without compensation to the CONTRACTOR under the provisions of this section.

E. The CONTRACTOR shall continue to perform the work in accordance with the requirements of the contract until an executed Change Order incorporating the cost reduction proposal has been issued. If any executed Change Order has not been issued by the date upon which the CONTRACTOR's cost reduction proposal specifies that a decision should be made by the OWNER, in writing, the cost reduction proposal shall be considered rejected.

F. The OWNER shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in Contract Time and construction costs resulting from the adoption of all or any part of such proposal. Should the CONTRACTOR disagree with OWNER's decision on the cost reduction proposal, there is no further consideration. The OWNER reserves the right to make final determination.

G. If the CONTRACTOR's cost reduction proposal is accepted in whole or in part, such acceptance will be made by a contract Change Order, which specifically states that the change is executed pursuant to this cost reduction proposal section. Such Change Order shall incorporate the changes in the plans and specifications which are necessary to permit the cost reduction proposal or such part of it as has been accepted to be put into effect and shall include any conditions upon which the OWNER's approval is based, if such approval is conditional. The Change Order shall also describe the estimated net savings in the cost of performing the work attributable to the cost reduction proposal, and shall further provide that the contract cost be adjusted by crediting the OWNER with the estimated net savings amount.

H. Acceptance of the cost reduction proposal and performance of the work does not extend the time of completion of the contract, unless specifically provided in the Change Order authorizing the use of the submitted proposal. Should the adoption of the cost reduction proposal result in a Contract Time savings, the total Contract Time shall be reduced by an amount equal to the time savings realized.

I. The amount specified to the CONTRACTOR in the Change Order accepted in the cost reduction proposal shall constitute full compensation for the performance of WORK. No claims for additional costs as a result of the changes specified in the cost reduction proposal shall be allowed.

J. The OWNER reserves the right to adopt and utilize any approved cost reduction proposal for general use on any contract administered when it is determined suitable for such application. Cost reduction proposals identical, similar, or previously submitted will not be accepted for consideration if acceptance and compensation has previously been approved. The OWNER reserves the right to use all or part of any cost reduction proposal without obligation or compensation of any kind to the CONTRACTOR.

K. The CONTRACTOR shall bear the costs, if any, to revise all bonds and insurance requirements for the project, to include the cost reduction WORK.

END OF SECTION

GENERAL. These Supplementary General Conditions make additions, deletions, or revisions to the General Conditions as indicated herein. All provisions which are not so added, deleted, or revised remain in full force and effect. Terms used in these Supplementary General Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

SGC 4.2 PHYSICAL CONDITIONS - SUBSURFACE AND EXISTING STRUCTURES. ***Add*** the following:

C. In the preparation of the Contract Documents, the Engineer of Record has relied upon:

1. Field measurements and visual inspection of the existing structures and surface conditions.

SGC 5.2 INSURANCE AMOUNTS. The limits of liability for the insurance required by Paragraph 5.2 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

A. Workers' Compensation: (under Paragraph 5.2, C.1 of the General Conditions) as in accordance with AS 23.30.045:

1. State: Statutory
2. Applicable Federal (e.g., Longshore): Statutory

Note: If the WORK called for in the Contract Documents involves work in or on any navigable waters, the CONTRACTOR shall provide Workers' Compensation coverage which shall include coverage under the Longshore and Harbor Workers' Compensation Act, the Jones Act, and any other coverage required under Federal or State laws pertaining to workers in or on navigable waters.

3. Employers Liability

Bodily Injury by Accident:	$100,000.00	Each Accident
Bodily Injury by Disease:	$100,000.00	Each Employee
Bodily Injury by Disease:	$500,000.00	Policy Limit

a. CONTRACTOR agrees to waive all rights of subrogation against the OWNER and ENGINEER for work performed under Contract.
b. If CONTRACTOR directly utilizes labor outside of the State of Alaska in the prosecution of the WORK, "Other States" endorsement shall be required as a condition of the Contract.

B. Commercial General Liability: (under Paragraph 5.2, C.2 of the General Conditions):

1. Combined Single Limit

a.	General Policy	$2,000,000.00	Each Occurrence
		$3,000,000.00	Annual Aggregate
b.	Products/Completed Operations	$2,000,000.00	Each Occurrence
		$3,000,000.00	Annual Aggregate

c. Personal Injury $2,000,000.00 Each Occurrence

C. Commercial Automobile Liability: (under Paragraph 5.2, C.3 of the General Conditions) including Owned, Hired, and Non-Owned Vehicles:

Combined Single Limit, Bodily Injury and Property Damage $1,000,000.00

D. Policies shall also specify insurance provided by CONTRACTOR will be considered primary and not contributory to any other insurance available to the OWNER or the ENGINEER.

E. All policies will provide for 30 Days written notice prior to any cancellation or nonrenewal of insurance policies required under Contract except in the event of no-payment of premium where 10 Days is permissible.

F. The OWNER and the ENGINEER shall be named as an "Additional Insured" under all liability coverages listed in this Section, except for workers' compensation insurance. CONTRACTOR shall furnish OWNER a certificate from the insurer showing the OWNER as an Additional Insured within ten (10) days of the CONTRACTOR receiving the Notice to Proceed. Failure of the CONTRACTOR to fully and strictly comply with this Section shall constitute a default and a material breach of the Agreement and Contract documents.

SGC 14.9 FINAL PAYMENT AND ACCEPTANCE. ***Add*** the following paragraph:

B. Prior to the final payment the CONTRACTOR shall contact the Alaska Department of Labor (ADOL) and provide the OWNER with clearance from the ADOL for the CONTRACTOR and all Subcontractors that have worked on the Project. This clearance shall indicate that all Employment Security Taxes have been paid. A sample letter for this purpose is provided at the end of this section.

SGC 16.8 CERTIFIED PAYROLLS. ***Change*** paragraph A. to read:

A. All CONTRACTORs or Subcontractors who perform work on a public construction contract for the OWNER shall file a certified payroll with Alaska Department of Labor. See Section 00830 - Alaska Labor Standards, Reporting, and Prevailing Wage Rate Determination.

Alaska Department of Labor
Juneau Field Tax Office
FAX 907-465-2374

From: _____

Subject: **Lift Station Generator Enclosure**

Timeframe of Contract _____

Please advise whether or not clearance is granted for the following CONTRACTOR or Subcontractor:

_____ _____
Name Address

Per AS 23.20.265 of the Alaska Employment Security Act, this request is for tax liability clearance and release to make final payment for WORK performed under the subject contract. Please send your response to:

Jeff Good, Borough Manager
City & Borough of Wrangell
PO Box 531
Wrangell, Alaska 99929
Telephone: (907) 874-2381
Fax: (907) 874-3952

( ) Tax Clearance is granted.
( ) Tax Clearance is NOT granted.

Remarks: _____

_____ _____
Signature Date

_____
Title

END OF SECTION

State of Alaska, Department of Labor, Laborers' and Mechanics' Minimum Rates of Pay, AS 36.05.010 and AS 36.05.050, Wage and Hour Administration Pamphlet No. 600, the latest edition published by the State of Alaska, Department of Labor inclusive, are made a part of this contract by reference.

The CONTRACTOR is responsible for contacting the Alaska Department of Labor to determine compliance with current regulations.

Required Reporting During Contract (to be provided by every CONTRACTOR and Subcontractor):

A. **Certified Payrolls must be submitted every two weeks. Before the second Friday,** each CONTRACTOR and Subcontractor must file Certified Payrolls with Statements of Compliance for the previous two weeks. If there was no activity for that pay period, indicate ***"No Activity."*** Indicate ***"Start"*** on your first payroll, and ***"Final"*** on your last payroll for this Project. Send to:

Wage and Hour Section
Labor Law Compliance Division
Alaska Department of Labor
P.O. Box 020630
Juneau, AK 99802-0630
(907) 465-4842

and

Project Manager
City & Borough of Wrangell
P.O. Box 531
Wrangell, AK 99929
(907) 874-3902

B. **Within 10 Days of "Notice of Award/Notice to Proceed"** make a list of **all** Subcontractors. Include their name, address, phone, estimated subcontract amount, and estimated start and finish dates. Send to:

Borough Clerk
City & Borough of Wrangell
P.O. Box 531
Wrangell, AK 99929
(907) 874-2381

and

Wage and Hour Section
Labor Law Compliance Division
Alaska Department of Labor
P.O. Box 020630
Juneau, AK 99802-0630
(907) 465-4839/4842

C. As part of the **final payment request package:**

A completed Compliance Certificate and Release form (provided in Section 01700 - Project Closeout) from every CONTRACTOR and Subcontractor.

A final Subcontractor list complete with final subcontract amounts and including all equipment rentals (with operators).

A Completion of Public Project form from the Alaska Department of Labor.

END OF SECTION

SECTION 00852*0* – PERMITS

PART 1 – GENERAL

1.1 GENERAL

A. The Contractor shall be responsible for securing local building and electrical permits.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 07 21 00
INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A Building wrap used primarily over wood exterior sheathing.

1.02 SUBMITTALS

A See Section 01 30 00 - Administrative Requirements for submittal procedures.

B Product Data: Provide data on product characteristics, performance criteria, and product limitations for all specified products.

1. For vapor barriers specifically provide:
   a. Manufacturer's product samples and literature.
   b. Manufacturer's installation instructions for placement, seaming and pipe boot installation.
2. For Acoustic Spray System specifically provide:
   a. Installation data including application thickness of applied product.

1.03 FIELD CONDITIONS

A Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

B Deliver material to the site in unopened packages, with identification labels intact.

C Store under water-resistant cover and protect from weather and direct sunlight.

D Remove damaged materials from site.

PART 2 PRODUCTS

2.01 BUILDING WRAP

A Tyvek Commercial "D" Wrap by DuPont de Nemours, www.dupont.com or equal.

1. High Performance Spunbonded olefin, non-woven, non-perforated with the following performance characteristics:
   a. Air Penetration: Type 1 when tested in accordance with ASTM E 1677.
   b. Water Vapor Transmission: 30 perms, when tested in accordance with ASTM E96, Method B.
   c. Water Penetration Resistance: 235 cm when tested in accordance with AATCC Test Method 127.
   d. Basis Weight: 2.4 oz/yd^2, when tested in accordance with TAPPI Test Method T-410.
   e. Air Infiltration Resistance: Air infiltration at >750 seconds, when tested in accordance with TAPPI Test Method T-460.
   f. Breaking Strength: 33/41 lbs/in., when tested in accordance with ASTM D 822, Method A.
   g. Tear Resistant (Trapezoid) 6/9 lbs when tested in accordance with ASTM D1117.
   h. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84. Flame Spread: 15, Smoke Developed: 25.
   i. UV Exposure: Up to 270 days/9 months without harming performance characteristics.
2. Seam Tape: 3" DuPont™ Tyvek® Tape.
3. Fasteners with Self-Gasketing high density polyethylene cap washers.
4. Composite, strip or fluid applied flashing and primer as recommended by manufacturer.
5. Sealants and/or closed cell polyurethane foam insulation as recommended by manufactuer.

PART 3 EXECUTION

3.01 EXAMINATION

A Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation/products.

B Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 PROTECTION

A Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 21 00

Issued Addendum No. 1

SECTION 26 05 73.01

FAULT CURRENT AND ARC FLASH STUDY

PART 1: GENERAL

1.01 SUMMARY

A. This Section includes computer-based, fault-current, and arc flash studies.

1. Equipment shall be labeled based on the results.

B. Study shall include field verification of existing conditions and equipment, as well as new equipment.

1.02 SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399.

C. Qualification Data: For coordination-study specialist.

D. Other Action Submittals: The following submittals shall be made at the same time with the submittal for approval for system protective devices.

1. Input data, including completed computer program input data sheets.
2. Study and Equipment Evaluation Reports.
3. Study shall include the following sections:

a. Executive Summary.
b. Descriptions, purpose, basis and scope of the study.
c. Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short circuit duties.
d. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip unit settings, fuse selection.
e. Fault current calculations including a definition of terms and guide for interpretation of the computer printout.
f. Details of the incident energy and flash protection boundary calculations.
g. Recommendations for system improvements, where conflicts occur.
h. One-line diagram.

E. Submit final report in hard copy format and electronic format (PDF and SKM file).

1.03 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.

B. Coordination-Study Specialist Qualifications: An entity experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

1. Professional engineer, licensed in the state where Project is located, shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of engineer.

C. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

D. Comply with IEEE 399 for general study procedures.

PART 2: PRODUCTS

2.01 COMPUTER SOFTWARE DEVELOPERS

A. Computer Software Developers: Provide products by the following:

1. SKM Systems Analysis, Inc.

2.02 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

A. Comply with IEEE 399.

B. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.

PART 3: EXECUTION

3.01 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance.

1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted at the same time with the coordination study may not be installed.

3.02 POWER SYSTEM DATA

A. Gather and tabulate the following input data to support coordination study:

1. Product Data for overcurrent protective devices specified in other Division 26 Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Impedance of utility service entrance.

3. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following:

a. Circuit-breaker and fuse-current ratings and types.
b. Relays and associated power and current transformer ratings and ratios.
c. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
d. Generator kilovolt amperes, size, voltage, and source impedance.
e. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.
f. Busway ampacity and impedance.
g. Motor horsepower and code letter designation according to NEMA MG 1.

4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

    a. Special load considerations, including starting inrush currents and frequent starting and stopping.
    b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
    c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
    d. Generator thermal-damage curve.
    e. Ratings, types, and settings of utility company's overcurrent protective devices.
    f. Special overcurrent protective device settings or types stipulated by utility company.
    g. Time-current-characteristic curves of devices indicated to be coordinated.
    h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
    i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
    j. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.

5. Present and future motors and generators.

6. If applicable, include fault contribution of existing motors in the study. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

3.03 FAULT-CURRENT STUDY

A. Calculate the maximum available short-circuit current in amperes rms symmetrical at circuit-breaker positions of the electrical power distribution system. The calculation shall be for a current immediately after initiation and for a three-phase bolted short circuit at each of the following:

1. Switchgear and switchboard bus.
2. Medium-voltage controller.
3. Motor-control center.
4. Distribution panelboard.
5. Branch circuit panelboard.
6. Generator.
7. Automatic Transfer Switches.
8. Other major electrical equipment.

B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.

C. Calculate momentary and interrupting duties on the basis of maximum available fault current.

D. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with IEEE 242.

1. Transformers:

    a. ANSI C57.12.10.
    b. ANSI C57.12.22.
    c. ANSI C57.12.40.
    d. IEEE C57.12.00.
    e. IEEE C57.96.

2. Medium-Voltage Circuit Breakers: IEEE C37.010.
3. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.20.1.
4. Low-Voltage Fuses: IEEE C37.46.

E. Study Report:

1. Show calculated X/R ratios and equipment interrupting rating (1/2-cycle) fault currents on electrical distribution system diagram.

F. Equipment Evaluation Report:

1. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

2. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.

3. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

G. Provide label for service entrance equipment.

1. Provide a minimum 3.5 in. x 5 in. thermal transfer type label of high adhesion polyester.

2. All labels will be provided after the results of the analysis have been presented to the owner and after any system changes, upgrades or modifications have been incorporated in the system.

3. The label shall include the following information, at a minimum:

a. Available fault current.
b. Date prepared.
c. Engineering company, report number, revision number.

4. Labels shall be machine printed, with no field markings.

3.04 ARC FLASH STUDY

A. Calculate available arc flash incident energy and determine personal protective equipment (PPE) requirements for each equipment.

B. Provide labels for installation at each equipment.

1. Provide a minimum 3.5 in. x 5 in. thermal transfer type label of high adhesion polyester for each work location analyzed.

2. All labels will be based on recommended overcurrent device settings and will be provided after the results of the analysis have been presented to the owner and after any system changes, upgrades or modifications have been incorporated in the system.

3. The label shall include the following information, at a minimum:

a. Arc hazard boundary (inches).
b. Working distance (inches).
c. Arc flash incident energy at the working distance (calories/ cm2).
d. PPE category and description including the glove rating.

e. Voltage rating of the equipment.
f. Limited approach distance (inches).
g. Restricted approach distance (inches).
h. Prohibited approach distance (inches).
i. Equipment/bus designation.
j. Date prepared.
k. Engineering company, report number, revision number.

4. Labels shall be machine printed, with no field markings.

3.05 FIELD ADJUSTMENT

A. Adjust relay and protective device settings according to the recommended provided by the coordination study.

B. Make modifications to equipment as required to accomplish conformance circuit and protective device coordination studies.

C. Notify Owner in writing of any required major equipment modifications.

END OF SECTION 26 05 73.01

SECTION 26 27 01

ELECTRICAL UTILITY COORDINATION

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes underground electrical service requirements that will be installed to serve the facility.

B. Related Sections include the following:

1. Division 26 Section "26 05 00" – General Requirements
2. Division 26 Section "26 05 19" – Electrical Power Conductors
3. Division 26 Section "26 05 26" – Grounding and Bonding
4. Division 26 Section "26 05 33" – Raceways & Boxes for Electrical Systems
5. ***Division 26 Section "26 28 16" – Enclosed Switches and Circuit Breakers***

1.02 SUBMITTALS

A. Product Data: For the following:

1. Combination Meter Socket and Service Disconnect

1.03 COORDINATION

A. Coordinate location of electrical service with the drawings, Engineer, Architect and Utility Company.

B. Coordinate exact dimensions and construction requirements with the local utility.

C. Coordinate minimum clearance requirements with the local utility.

D. The service connections shall be installed in strict accordance with the rules of the power company.

PART 2 PRODUCTS

2.01 CURRENT TRANSFORMER / METERING CABINET

A. Acceptable Manufacturers:

1. States Electric
2. AMP
3. EMI
4. Square D
5. Or Approved Equals

B. Provide a meter cabinet as required by the Power Company.

C. Meter cabinet shall be weatherproof / rustproof with lockable removable access cover.

D. Provide a raceway as required between the meter cabinet and transformer.

E. Provide raceways and connections from the meter cabinet to the panelboard.

F. Locate utility metering and current transformers in the cabinet. Coordinate with the utility.

PART 3 EXECUTION

3.01 INSTALLATION

A. The service connections shall be installed in strict accordance with the rules of the Utility. Initiate and take responsible charge for all negotiations with the Utility with regard to the service connections, and initiate the necessary requests to the Utility for the work which will be performed by them.

B. The underground electrical service shall be installed from the local utility service to the building service entrance equipment. The equipment shall be provided and installed by the Power Company (Utility) or Electrical Contractor (Contractor) as scheduled below. Verify all responsibilities with Utility prior to bid.

		Furnished By	Installed By
1.	Site Restoration	Contractor	Contractor
2.	Secondary Connections @ Transformer	Contractor	Contractor
3.	Secondary Service Trenching	Contractor	Contractor
4.	Secondary Electrical Conductors	Contractor	Contractor
5.	Secondary Raceways	Contractor	Contractor
6.	Electrical Meter(s)	Utility	Utility
7.	Electrical Meter Socket	Contractor	Contractor
8.	Current Transformers (utility meter)	Utility	Contractor
9.	Metering Conductor Raceway	Contractor	Contractor
10.	Metering Conductors	Contractor	Contractor
11.	Raceway from ~~CC~~ ***Meter Socket*** to Transformer	Contractor	Contractor

3.02 SERVICE CHARGES

A. Fees and charges submitted by the Utility for the work associated with new or relocated metering for this project shall be responsibility of Contractor. All other fees shall be borne by the Owner.

B. Electrical contractor shall coordinate exact requirements with the utility. No extra charges will be allowed because of the failure of the contractor to contact the Utility and determine what will be required to complete the service installation.

C. Charges (the electric bill) for power consumed during the construction of this project will be borne by the Owner.

3.03 GROUNDING

A. Provide grounding as required by the Utility, National Electrical Code.

B. Ground equipment according to Division 26 05 26 Section "Grounding and Bonding."

END OF SECTION 26 27 01

SECTION 26 32 13

ENGINE GENERATORS

PART 1: GENERAL

1.1 SCOPE

A. This Section includes the installation of an Owner-furnished electric generating set of the type and operating characteristics described hereinafter, completely installed, tested, and operative. All necessary equipment, labor, and materials shall be included. Contractor shall provide the required permits, generator modeling, and associated costs to install the new generator. The Registration Permit will require Dispersion Modeling using the EPA SCREEN 3 model.This Section includes installation of a packaged engine-generator set for a Level 2 emergency power supply system.

C. Concrete Bases:

1. Equipment Mounting: Install generator on concrete base. Comply with requirements for concrete base specified in Division 03 Section. Concrete shall be 4,500 minimum PSI with synthetic microfiber reinforcement.

    a. Coordinate size of equipment bases with actual unit sizes provided. Fabricate base 4 inches larger in both directions than the overall dimensions of the supported unit. Chamfer top edge and corners of pad.
    b. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
    c. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
    d. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    e. Install anchor bolts to elevations required for proper attachment to generator.

1.2 SUBMITTALS

A. Source quality-control test reports.

1. Certified summary of prototype-unit test report.
2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.
4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements
5. Report of sound generation.
6. Report of exhaust emissions showing compliance with applicable regulations.
7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.
8. Field Quality C
9. Field quality-control test reports.

B. Operation, Maintenance, and Warranty Data: For packaged engine generator to include in emergency, operation, maintenance, and warranty data manuals. In addition to items specified in Division 01 Section "Operation, Maintenance, and Warranty Data," include the following:

1. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.

1.3 QUALITY ASSURANCE

A. Installer Qualifications:

1. An employer of workers qualified as defined in NEMA PB 1.1 and trained in electrical safety as required by NFPA 70E.
2. Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
3. Maintenance Proximity: Not more than four hours' normal travel time from Installer's place of business to Project site.
4. Engineering Responsibility: Preparation of data for vibration isolators and seismic restraints of engine skid mounts, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Comply with NFPA 37 and 70.

C. Comply with NFPA 110 requirements for Level 2 emergency power supply system.

D. Engine Exhaust Emissions: Comply with applicable state and local government requirements.

E. Noise Emission: Comply with applicable state and local government requirements for maximum noise level due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

F. Comply with UL2200.

1.4 PROJECT CONDITIONS

A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: -20F to 100F.
2. Altitude: Sea level to 1000 feet (300 m).
3. Do not deliver or install interior engine-generator sets until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above engine-generators is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving engine-generators into place.

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Architect, Construction Manager, and Owner no fewer than two weeks in advance of proposed interruption of service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without written permission from Architect, Construction Manager and Owner.
4. Comply with NFPA 70E.

1.5 REFERENCES

A. The products provided by this section shall comply with the following applicable references (latest edition):

1. ASME B15.1 – Safety Standard for Mechanical Power Transmission.
2. NFPA 37 – Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines.

3. NFPA 110 – Standard for Emergency and Standby Power Systems.
4. UL 2200 – Stationary Engine Generator Assemblies

1.6 COORDINATION

A. Coordinate size and location of concrete bases for package engine generators. Provide base thickness and size as recommended by generator supplier as a minimum or as indicated. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03. Coordinate layout and installation of generator with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2: PRODUCTS

2.1 GENERAL INFORMATION.

A. Generator to be furnished by Owner and turned over to contractor for installation. Provide all necessary equipment and material for complete and working installation.

B. All electrical equipment and material shall be new and bear a recognized testing laboratory's label, where applicable. The type of equipment and/or material shall be designated by the location where it will be installed and so defined by NEMA / NFPA 70 standards.

PART 3: EXECUTION

3.1 GENERAL INSTALLATION

A. Engine generators shall be installed in a neat and workmanlike manner. The NEIS Standard Practices for Good Workmanship in Electrical Contracting NECA 1-2006 is hereby adopted to define such workmanship and the installation of conductors and cables.

B. Provide all equipment, wiring, conduit, and junction boxes required for the installation of a complete and operating system in accordance with applicable local, state, and national codes, the manufacturers' recommendations, these plans and specifications.

3.2 EXAMINATION

A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.

B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.

B. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

C. Install packaged engine generator with elastomeric isolator pads having a minimum deflection of 1 inch on 4-inch-(100-mm-) high concrete base. Secure sets to anchor bolts installed in concrete bases. Verify and provide structural support bars, and thickness and size of concrete base required by manufacturer of genset.

D. Install Schedule 40, black steel piping with welded joints and connect to engine muffler. Install thimble at wall or ceiling. Size exhaust vent per manufacturer's isntructions. Provide flexible connectors and steel piping materials and installation requirements to meet as specified in Division 23 Section "Hydronic Piping."

1. Install condensate drain piping to muffler drain outlet full size of drain connection with a shutoff valve, stainless-steel flexible connector, and Schedule 40, black steel pipe with welded joints.

E. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted. Provide all interconnection and control wiring in conduit between genset and all automatic transfer switches and remote alarm, control and/or monitoring and annunciator panels. Verify wire quantities and types with manufacturer(s) of alarm or monitoring panels.

F. Connect generator dampers, fuel pump motors and associated electrically operated items on emergency power circuits where required for generator operation.

G. Provide full tank of fuel after testing is complete.

3.4 CONNECTIONS

A. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.

B. Connect engine exhaust pipe to engine with flexible connector.

C. Connect louver to generator exhaust with ducting.

D. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

E. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.5 IDENTIFICATION

A. Identify system components according to Division 26 Section "Identification for Electrical Systems."

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Perform tests recommended by manufacturer and each electrical test and visual and mechanical inspection for "AC Generators and for Emergency Systems" specified in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.

a. Testing shall include demonstration of all operational requirements, including open and closed transition switching as applicable at light (quarter-load), medium (half-load) and full load. Testing shall also include four consecutive hours of operation at full load.

3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.

b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.Verify acceptance of charge for each element of the battery after discharge.
c. Verify that measurements are within manufacturer's specifications.

4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
6. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
7. Harmonic-Content Tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.
8. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations on the property line.

C. Coordinate tests with tests with transfer switches and run them concurrently.

D. Test instruments shall have been calibrated within the last 12 months, traceable to standards of NIST, and adequate for making positive observation of test results. Make calibration records available for examination on request.

E. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

F. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

I. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

J. Include all testing reports in Operation, Maintenance, and Warranty Data Manual(s).

3.7 DEMONSTRATION

A. ~~**Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators. Provide video taping of this session. Refer to Division 01 Section "Demonstration and Training." Provide an 8-hour training session for Owner personnel.**~~ ***Training to be provided by Owner's vendor.***

END OF SECTION 26 32 13

SECTION 26 36 00

TRANSFER SWITCHES

PART 1: GENERAL

1.1 SCOPE

A. This Section includes the installation of an Owner-furnished automatic transfer switch(es) of the type and operating characteristics described hereinafter, completely installed, tested, and operative. All necessary equipment, labor, and materials shall be included.

1.2 SUBMITTALS

A. Field quality-control test reports.

B. Operation, Maintenance, and Warranty Data: For each type of product to include in emergency, operation, maintenance and warranty data manuals. In addition to items specified in Division 01 Section "Operation, Maintenance, and Warranty Data," include the following:

1. Features and operating sequences, both automatic and manual.

2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

1.3 QUALITY ASSURANCE

A. Installer Qualifications:

1. An employer of workers qualified as defined in NEMA PB 1.1 and trained in electrical safety as required by NFPA 70E.
2. Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
3. Maintenance Proximity: Not more than four hours' normal travel time from Installer's place of business to Project site.

1.4 REFERENCES

A. The products provided by this section shall comply with the following applicable references (latest edition):

1. NEMA ICS1 – Industrial Control and Systems.
2. NEMA ICB-10-1993.
3. NFPA 110 – Standard for Emergency and Standby Power Systems.
4. UL 1008 – Transfer Switch Equipment.
5. IEC 947-6-1.
6. IEEE Standard 446.

1.5 COORDINATION

A. Coordinate size and location of transfer switches. Coordinate layout and installation of transfer switch with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Mount on concrete pads where indicated. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

PART 2: PRODUCTS

2.1 GENERAL INFORMATION.

A. ATS to be furnished by Owner and turned over to contractor for installation. Provide all necessary equipment and material for complete and working installation.

B. All electrical equipment and material shall be new and bear a recognized testing laboratory's label, where applicable. The type of equipment and/or material shall be designated by the location where it will be installed and so defined by NEMA / NFPA 70 standards.

2.2 CONCRETE BASES

A. Equipment Mounting (where floor-mounting is required): Install on concrete base, 4-inch nominal thickness. Comply with requirements for concrete base specified in Division 03 Section.

1. Coordinate size of equipment bases with actual unit sizes provided. Fabricate base 4 inches larger in both directions than the overall dimensions of the supported unit. Chamfer top edge and corners of pad.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to transfer switch.

PART 3: EXECUTION

3.1 GENERAL INSTALLATION

A. Transfer switches shall be installed in a neat and workmanlike manner. The NEIS Standard Practices for Good Workmanship in Electrical Contracting NECA 1-2006 is hereby adopted to define such workmanship and the installation of conductors and cables.

B. Provide all equipment, wiring, conduit, and junction boxes required for the installation of a complete and operating system in accordance with applicable local, state, and national codes, the manufacturers' recommendations, these plans and specifications.

C. Mount on 4" concrete bases where floor mounting is indicated.

3.2 EXAMINATION

A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting transfer switch performance.

B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before transfer switch installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with transfer switch manufacturers' written installation and alignment instructions and with NFPA 110. Verify / coordinate generator manufacturers' written installation and alignment instructions.

B. Identify components according to Division 26 Section "Identification for Electrical Systems."

C. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

3.4 CONNECTIONS

A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections per requirements below. Report results in writing.

B. Perform tests and inspections and prepare test reports.

1. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

    a. Check for electrical continuity of circuits and for short circuits.
    b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
    c. Verify that manual transfer warnings are properly placed.
    d. Perform manual transfer operation.

3. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.

    a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    c. Verify time-delay settings.
    d. Verify pickup and dropout voltages by data readout or inspection of control settings.
    e. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

C. Coordinate tests with tests of generator and run them concurrently.

D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

E. Remove and replace malfunctioning units and retest as specified above.

F. Include all test results in Owner’s Operation, Maintenance, and Warranty Data manuals.

3.6 DEMONSTRATION

A. ~~**Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 Section "Demonstration and Training." Include up to 4 hours training.**~~ ***Training to be provided by Owner’s vendor.***

~~**B. Coordinate this training with that for generator equipment.**~~

END OF SECTION 26 36 00

N C POWER SYSTEMS

WRANGELL LIFT STATION
TECHNICAL SUBMITTAL DATA

CATERPILLAR C4.4 LCABR D40-LC2

PACKAGED STATIONARY DIESEL ENGINE GENERATOR SET
RATED 40KW STANDBY POWER, 208/120VAC, 3-Φ, 0.8PF, 60HZ

NC PROJECT # 220075

PREPARED FOR:
CITY AND BOROUGH OF WRANGELL
PO. # 2535 / REQ. # 731

PROJECT:
WRANGELL LIFT STATION
WRANGELL, ALASKA

COMPILED BY:
N C POWER SYSTEMS CO.
6450 ARCTIC BLVD, ANCHORAGE, AK 99518
(907) 786-7500

ROB COLLINS – SALES REPRESENTATIVE
ANDY MILLER – PROJECT MANAGER

SUBMITTAL REVISION: PRELIMINARY
FEBRUARY 1, 2022

HB3

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WRANGELL LIFT STATION
C4.4LCABR D40-LC2 DIESEL GENERATOR SET
175KW STANDBY, 208/120VAC, 3-Φ, 0.8PF, 60Hz

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

NC POWER SYSTEMS

SCOPE OF SUPPLY

CUSTOMER: CITY AND BOROUGH OF WRANGELL
PROJECT: WRANGELL LIFT STATION

DATE: 2-Feb-22
PROJECT No. 220075

C4.4LCABR D40-LC2 DIESEL GENERATOR SET
40KW STANDBY, 208/120VAC, 3-Φ, 0.8PF, 60Hz

ITEM	QTY	NUMBER	DESCIPTION
			C4.4LCABR D40-LC2 DIESEL GENERATOR SET
1	1	NAC147P	D40-LC2 60Hz **ENGINE PACKAGE DESCRIPTION** ENGINE Electrical system,12 VDC Std Air Cleaner - Medium Duty Oil temperature Gauge and Sender (ML1) Coolant and lube drains piped to the edge of base D40-2LC and D50-2LC product includes Electronic Governor D60-4LC product includes A4:E2 electronic engine contrl w/Speed Adjust thru EMCP Tier 3 EPA Approved Emissions Certified EPA certified for stationary use only during defined emergency conditions Outside EPA-regulated territories and in Guam,American Samoa or the Commonwealth of the Northern Mariana Islands,these restrictions do not apply **INTEGRATED VOLTAGE REGULATOR (Digital):** EM10 Excitation Module Voltage within +/- 0.25% at steady state from no load to full load Provides fast recovery from transient load changes **GOVERNOR TYPE** ELECTRONIC GOVERNOR GE5 STD **CHARGING SYSTEM** CAT Premium High Output Battery(s) with rack & cables Installed (wet);1000CCA;90amp hr;12V. **CIRCUIT BREAKERS** Optional UL/CSA listed mainline breaker(s) Optional Multiple Breaker(s) 100 % Rated 3-pole w ith solid neutral NEMA 1 steel enclosure Electrical stub-up area directly below circuit breaker **CONTROL PANELS** NEMA 1 enclosure Wiring loom DC and Ac wiring harness EMCP 4.2B controls including: std -Run / Auto / Stop Control std -Speed Adjust std -Voltage Adjust std -Engine Cycle Crank std -Emergency Stop pushbutton std -Audible Alarm (PAA1) EMCP 4.2B controller features: std -12-volt DC operation std -Environmental sealed front face std -Text alarm/event descriptions

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ITEM	QTY	NUMBER	DESCIPTION
			Digital indication for:
			std -RPM
			std -DC Volts
			std -Operating Hours
			std -Oil Pressure (psi)
			std -Coolant Temperature
			std -Volts (L-L & L-N), frequency (Hz)
			std -Amps (per phase & average)
			std -Power Factor (per phase & average)
			std -kW (per phase,average & percent)
			std -kVA (per phase,average & percent)
			std -kVAr (per phase,average & percent)
			std -kW-hr (total)
			std -kVAr-hr (total)
			Warning/shutdown with common LED indication of shutdowns for:
			std -Low Oil Pressure
			optional -Low Coolant level
			std -Low Coolant temperature alarm (detects jacket water heater failure)
			std -High Coolant temperature shutdown
			Programmable protective relaying functions:
			std -Generator phase sequence
			std -Over/Under voltage (27/59)
			std -Over/Under Frequency (81 o/u)
			std -Reverse Power (kW) (32)
			std -Reverse Reactive Power (kVAr) (32RV)
			std -Overcurrent (50/51)
			Communications
			std -Customer DATA link (Modbus RTU)
			optional -Accessory module DATA link
			std -RS485 Serial DATA link (terminals only)
			std -8 programmable digital outputs available
			std -2 relays pre-programmed
			optional -4 programmable relay outputs (Form A)
			std -8 programmable digital inputs available
			std -2 pre-programmed
			optional -6 programmable digital inputs
			optional -1 analog inputs
			Compatible with the following optional modules:
			optional -Remote CAN annunciator
			COOLING SYSTEM
			Radiator and cooling fan complete with protective guards
			Standard ambient temperatues up to 50degC (122degF)
			50% coolant antifreeze/corrosion inhibitor

NC POWER SYSTEMS

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C4.4LCABR D40-LC2 DIESEL GENERATOR SET
40KW STANDBY, 208/120VAC, 3-Φ, 0.8PF, 60Hz

ITEM	QTY	NUMBER	DESCIPTION
			GENERATORS GENERATOR SET 60Hz Complete system designed and built at ISO 9001:2000 certified facilities Factory tested to design specifications at full load conditions and all protective devices and control functions simulated and checked GENERATOR Insulation system,class H Drip proof generator air intake (NEMA 2,IP23) Electrical design in accordance with BS5000 Part 99,EN61000-6, IEC60034-1,NEMA MG-1.33 EQUIPMENT FINISH All electroplated hardware or stainless steel Anticorrosive paint protection High gloss polyurethane paint for durability and scuff resistance QUALITY STANDARDS BS4999,BS5000,BS5514,EN61000-6,IEC60034,NEMA MG-1.33, NFPA 110 (with optional equipment) **LITERATURE** DOCUMENTATION Operation & Maintenance Manual (OMM) with storage compartment Wiring diagrams included **MOUNTING SYSTEM** Optional heavy-duty fabricated steel base with lifting points Anti-vibration pads to ensure vibration isolaton Stub-up pipe ready for connection to silencer pipework Complete OSHA guarding Flexible fuel lines to base **GENERAL** Accessories Power Supply Voltage 120V AC AC Receptacle (used for optional jacket water heater and / or battery charger GFCI AC Receptacle and Wiring **WARRANTY** Warranty per SELF5611

NC POWER SYSTEMS

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ITEM	QTY	NUMBER	DESCIPTION
			ADDITIONAL CATERPILLAR OPTIONS:
2	1	CERTESE	EPA STATIONARY EMERGENCY
3	1	VOP610	60Hz 3PH 208/120V VOP610
4	1	STANDBY	STANDBY POWER
5	1	KW00040	60 Hz, 40 kW
6	1	NAC147P	D40-LC2 60Hz.
7	1	LANENGC	ENGLISH PANEL LANGUAGE
8	1	ULLIST	UL 2200 LISTED PACKAGE GEN SET
9	1	NONCSA	NO CSA CERTIFICATION
10	1	IBCSCCA	IBC_SEISMIC CERT OF COMPLIANCE
11	1	LANENGO	ENGLISH INSTRUCTION LANGUAGE
12	1	MSEPGGN	GENERAL EPG
13	1	MSCEC70	ENERGY UTILITIES
14	1	MWCODEF	STANDBY POWER
15	1	AH1H	ALT SPACE HEATER
16	1	GENT125	125C TEMP RISE OVER 40C AMB
17	1	OGNSEAJ	LC1514L 60Hz SE ALT AJ
18	1	PMEXCI3	PERMANENT MAGNET EXCITATION
19	1	INFT140	INTEGRAL FUEL TANK 137 GAL
20	1	NONSBFT	NO SUB BASE FUEL TANK.
21	1	FFLCK	FUEL TANK FILL PIPE & LOCK CAP
22	1	NOTRQD	NO TANKS RISER
23	1	NOTRQD	NO VENT PIPE
24	1	FSS	Fuel Level Alarms / SD
25	1	ENCSA88	SOUND ATTENUATED ENC WHITE
26	1	NPVW	STANDARD PANEL DOOR WITH ENC
27	1	EMCP42B	EMCP4.2B CONTROL PANEL
28	1	NFPA	NFPA BUNDLE
29	1	STDBAT	STANDARD BATTERY
30	1	PBC10NU	NFPA BATT CHARGER UL10A 120VAC
31	1	WHH	JACKET WATER HEATER
32	1	ML1	OIL TEMP GAUGE AND SENDER
33	1	VFRCON	VOLT FREE CONTACTS GENSET RUN
34	1	WSS1	LOW COOLANT LEVEL SHUTDOWN 1
35	1	CWRESV	COOLANT RESERVIOR
36	1	VIB4	SEISMIC VIBRATION ISOLATORS.
37	1	PAA1	PANEL MOUNTED AUDIBLE ALARM
38	1	NOTRQD	NO POWER TERMINAL STRIP
39	1	SINGLE	SINGLE CIRCUIT BREAKER
40	1	CB0150A	150A 100% RATED BREAKER
41	1	NOTRQD	NO CIRCUIT BREAKER REQUIRED
42	1	NOSUSEB	NEUTRAL BAR ONLY 125 TO 400A
43	1	SHTAUX1	AUXILIARY CONTACTS
44	1	NOSUSE1	NO SUSE FOR 1ST BREAKER
45	1	STDRAD	STANDARD RADIATOR
46	1	CAN	ENCLOSURE SILENCER

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ITEM	QTY	NUMBER	DESCIPTION
47	1	PL444	PRODUCT LINK 4G LTE TELEMATICS
48	1	AM	AMERICAS BAND
49	1	TCVYES	ACCEPT - REVIEW LINK IN DESC
50	1	STDTEST	STD TEST - PKG GEN SET 0.8 PF
51	1	SWP0021	SHRINK WRAP PROTECTION 21
52	1	TRSGEN7	PGS TEST REPORT @ 0.8 PF
53	0	NOTRQD	NOT REQUIRED
54	0	NOTRQD	NOT REQUIRED
ITEM	Qty		**ADDITIONAL COMPONENTS:**
55	1	ATC3C2X30100WSU	AUTOMATIC TRANSFER SWITCH, 100A, 3P, Open Transition, ATC-300+ 240V, 60Hz, 3 Phase, 4 Wire, 3 Pole Open Transition Contactor Switch, 2 Position NEMA 1 Wall Mount Enclosure
56	1		EMERGENCY STOP BUTTON - GLASS
ITEM	Qty		**DEALER SITE SERVICES**
57	1		DEMONSTRATION AND TRAINING

WRANGELL LIFT STATION

CLARIFICATION OF SUPPLY

NC Power Systems Co. will not supply the following items unless they are specifically itemized in the quotation, purchase order, or subsequent change orders:

1. Off engine piping of any kind. (vents, fuel etc.)
2. Pipe hangers, brackets, isolators, or in-line valves for item 1.
3. Off engine wiring, conduit, conduit fittings, or lugs.
4. Design of the systems described above.
5. Electrical components required by code but not detailed in the specification.
6. Concrete Slabs.
7. Anchors.
8. Unloading at the jobsite. Cranes, Rigging. Installation.
9. Filling of fuel for testing or training and upon completion of this period, the refill of full supply of fuel.
10. Prices do not include installation, fuel, any local taxes, second freight charges, off-engine pumps or piping for fuel or exhaust systems, ducting air intake/exhaust or flex adapters, unit off-loading or setting in place, fuel permits, or any licenses that may be applicable.
11. NC Power Systems Co. is supplying equipment only. Installation of all shipped loose components is the responsibility of the installing contractor.
12. Caterpillar Application and Installation guides are available.
13. Installation, startup and commissioning to be quoted and provided by nearest local contractor.

The proposed equipment are in compliance with the project specifications, except as noted below:

1. Not applicable, no specification given to review

NC POWER SYSTEMS

SECTION 1

CERTIFICATIONS

ATTACHMENTS

ULCERT
UL 2200 LISTING

INCLUDES THE FOLLOWING:

ALTERNATOR
Alternator insulation system is UL Recognized (UL 1446). PMG and AREP alternators are available. Automatic voltage regulators are UL Recognized.

WIRE HARNESS
AC, DC, and power harnesses are made with UL Listed wire and UL Listed terminals.

CONTROL PANEL
Control panels are comprised of UL Listed and UL Recognized components. EMCP is UL Recognized.

CIRCUIT BREAKER
Output circuit breaker is 100% rated and UL Listed.

TESTING
All UL Listed sets are designed and rigorously tested in accordance with UL Standard for Safety, UL 2200.

LABELING
Labeling meets UL requirements.

MECHANICAL OPTIONS
Mechanical options do not require UL Listing and, therefore, are not affected. The exceptions to this are:

FUEL TANKS
If a fuel tank is ordered with the unit, it must be UL Listed. Two versions are available: 24 hour integral (FCUL2) and 24/48 hour sub-base (FSBT)

ENCLOSURES
Factory installed enclosures meet UL requirements. Weatherproof and sound attenuated versions are available.

ELECTRICAL OPTIONS
The table below shows electrical options that meet UL requirements:

EOS	Lube Oil Sump Heater
WCA1	Low Coolant Level Shutdown
WSS1	Low Coolant Temperature Alarm
AH1H	Anti-Condensation Heater
WHH	Coolant Heater
GOVES	Electronic Governor (Fully Adjustable)
FSS1	Critical Low Fuel Level Shutdown
FSS2	Low Fuel Level Alarm
FSSS	Critical High Fuel Alarm
PBCSUL	UL Listed Battery Charger
PBC10NU	NFPA Battery Charger, UL Listed

UL Listing is available on all diesel fuelled generator sets up to 17S kW at 60 Hz, 600 vac maximum.

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BUILT FOR IT.

VMC GROUP
THE POWER OF TOGETHER™

CATERPILLAR®

CERTIFICATE OF COMPLIANCE
SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-50365-01C (Revision 13)

Expiration Date: 9/30/2023

Certification Parameters:

The nonstructural products (mechanical and/or electrical components) listed on this certificate are CERTIFIED[1] FOR SEISMIC APPLICATIONS in accordance with the following building code[2] releases.

IBC 2018, 2015, 2012, 2009, 2006

The following model designations, options, and accessories are included in this certification. Reference report number VMA-50365-01 as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

Caterpillar; Diesel Gensets
Series C4.4LC, C4.4, C6.6, C7.1, C9, C13, C15, C18

The above referenced equipment is **APPROVED** for seismic application when properly installed[3], used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance[4]. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as I_p=1.5. The equipment is qualified by comparative analysis and successful seismic shake table testing at the nationally recognized University of California Berkeley Pacific Earthquake Engineering Research Center and CERL (US Army Corp. of Engineers) Laboratory under the review of the ISO Accredited Product Certification Agency, the VMC Group.

Certified Seismic Design Levels			
Certified **IBC**	**Importance $I_p \leq 1.5$** Soil Classes A-E Risk Categories I-IV Design Categories A-F	z/h ≤ 1.0	z/h = 0.0
		$S_{DS} \leq 0.753$ g	$S_{DS} \leq 2.260$ g

Certified Seismic Installation Methods[8]	
Rigid Mounting From Unit Base To Rigid Structure	Rigid Mounting From Unit Base To Fuel Tank
External Isolation Mounting From Unit Base To Rigid Structure	

HEADQUARTERS
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thevmcgroup.com

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CATERPILLAR®

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

Series	Max Rating [kW]	EPA Rating	Length [in]	Width [in]	Height [in]	Max. Off Tank Weight [lbs]	Max. On Tank Weight [lbs]	S_{DS} at z/h=0.0	S_{DS} at z/h=1.0	Certified Installation Methods
C4.4LC	60	Tier 3	98	43	78	2,293	4,979	2.49	0.83	Rigid
C4.4	100		136	44	92	3,961	8,516			
C6.6	175		198		96	5,080	12,752			
C7.1	200					5,338	13,010			
C9	300		219	81	114	8,364	19,850	2.26	0.75	Rigid and Externally Spring Isolated
C13	400		286		124	11,036	30,864			
C15	450		251		127	11,393	28,504			
	500	Tier 2				11,923	29,034			
C18	600		286		124	12,179	32,031			
	500	Tier 4F	247	90	111	13,720	21,687			
	750	Tier 2	275	91	106	15,585	N/A			Rigid
						N/A	28,209		1.29	

Group	Type	SDS (z/h=0)	SDS (z/h=1)	A_{Flex-H}	A_{Rig-H}	A_{Flex-V}	A_{Rig-V}	F_p/W_p
Seismic	AC156	2.26	0.75	2.26	0.9	1.51	0.6	0.54

Notes:
1. Weights include genset, enclosure (where applicable), tank and fuel (where applicable)
2. For a detailed list of weights, certified installation methods, and certified seismic design levels please refer to the certification report referenced on the first page of this certificate.

This certification includes the open generator set and the enclosed generator set when installed with or without the sub-base tank. This certification also includes the sub-base tank as a stand-alone accessory. The generator set and included options shall be a catalogue design and factory supplied. The generator set and applicable options shall be installed and attached to the building structure per the manufacturer supplied seismic installation instructions. For a list of certified configurations and options please directly contact the manufacturer. This certification excludes all non-factory supplied accessories, including but not limited to mufflers, isolation/restraint devices, remote control panels, remote radiators, pumps and other electrical/mechanical components.

IBC CERTIFIED VMC GROUP

VMA-50365-01C (Revision 13)
Issue Date: Friday, May 6, 2016
Revision Date: Friday, November 20, 2020
Expiration Date: Saturday, September 30, 2023

CERTIFICATE OF COMPLIANCE
SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Notes & Comments:

1. All equipment listed herein successfully passed the seismic acceptance criteria for shake testing non-structural components and systems as set forth in the ICC AC-156. The Test Response Spectrum (TRS) enveloped the Required Response Spectrum (RRS) for all units tested. The tested units were representative sample(s) of a contingent of models and all remained captive and structurally sound after the seismic shake simulation. The units also remained functionally operational after the simulation testing as functional testing was completed by the equipment manufacturer before and after the seismic simulations. Although a seismic qualified unit inherently contains some wind resisting capacity, that capacity is undetermined and is excluded from this certification. Snow/Ice loads have been neglected and thus limit the unit to be installed both indoors (covered by an independent protective structure) and out of doors (exposed to accumulating snow/ice) for ground snow loads no greater than 30 psf for all applications.

2. The following building codes are addressed under this certification:
   IBC 2018 referencing ASCE7-16 and ICC-ES AC-156
   IBC 2015 referencing ASCE7-10 and ICC-ES AC-156
   IBC 2012 referencing ASCE7-10 and ICC-ES AC-156
   IBC 2009 referencing ASCE7-05 and ICC-ES AC-156
   IBC 2006 referencing ASCE7-05 and ICC-ES AC-156

3. Refer to the manufacturer supplied installation drawings for anchor requirements and mounting considerations for seismic applications. Required anchor locations, size, style, and load capacities (tension and shear) may be specified on the installation drawings or specified by a 3rd party. Mounting requirement details such as anchor brand, type, embedment depth, edge spacing, anchor-to-anchor spacing, concrete strength, special inspection, wall design, and attachment to non-building structures must be outlined and approved by the Engineer of Record for the project or building. Structural walls, structural floors, and housekeeping pads must also be seismically designed and approved by the project or building Structural Engineer of Record to withstand the seismic anchor loads as defined on the installation drawings. The installing contractor is responsible for ensuring the proper installation of all anchors and mounting hardware.

4. For this certificate and certification to remain valid, this certificate must correspond to the "Seismic Certification Label" found affixed to the unit by the factory. The label ensures the manufacturer built the unit in conformance to the IBC seismic design criteria set forth by the Certified Seismic Qualification Agency, the VMC Group, and meets the seismic design levels claimed by this certificate.

5. Mechanical, Electrical, and Plumbing connections to the equipment must be flexibly attached as to not transfer load through the connection. The structural integrity of any conduit, cable trays, piping, ductwork and/or flexible connections is the responsibility of others. This certification does not guarantee the equipment will remain compliant to NEMA, IP, UL, or CSA standards after a seismic event.

6. This certificate applies to units manufactured at:
   1720 West Kingsbury Street, Seguin, TX 78155
   Rodovia Luiz de Queiorz-KM 157 CEP 13420-900, Piracicaba/SP-Brazil

7. This certification follows the VMC Group's ISO-17065 Scheme.

8. The certified seismic installation methods states are a summary for all series this certificate covers, for more detailed information on the certified seismic installation methods, see the certified product tables.

John P. Giuliano, PE
President, VMC Group

VMA-50365-01C (Revision 13)
Issue Date: Friday, May 6, 2016
Revision Date: Friday, November 20, 2020
Expiration Date: Saturday, September 30, 2023

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2021 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Perkins Engines Co Ltd**
(U.S. Manufacturer or Importer)

Certificate Number: MPKXL04.4NP1-005

Effective Date: 08/26/2020

Expiration Date: 12/31/2021

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 08/26/2020

Revision Date: N/A

Model Year: 2021
Manufacturer Type: Original Engine Manufacturer
Engine Family: MPKXL04.4NP1

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 56<=kW<75
Fuel Type: Diesel, Non-Standard Fuel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Effective with sales to the first user on or after August 1, 2016

CATERPILLAR LIMITED WARRANTY

Industrial, Petroleum, Locomotive, and Agriculture Engine Products and Electric Power Generation Products

Worldwide

Caterpillar Inc. or any of its subsidiaries ("Caterpillar") warrants new and remanufactured engines and new and rebuild electric power generation products sold by it (including any products of other manufacturers packaged and sold by Caterpillar), to be free from defects in material and workmanship.

This warranty does not apply engines sold for use in on-highway vehicle or marine applications; engines in machines manufactured by or for Caterpillar; C175, 3500 and 3600 series engines used in locomotive applications; 3000 Family engines, C0.5 through C4.4 and ACERT™ (C6.6, C7, C7.1, C9, C9.3, C11, C13, C15, C18, C27, and C32) engines used in industrial, mobile agriculture and locomotive applications; or Cat® batteries; or Electric Power Generation Products manufactured or assembled in India. These products are covered by other Caterpillar warranties.

This warranty is subject to the following:

Warranty Period

- For industrial engines, engines in a petroleum applications or Petroleum Power Systems (excluding petroleum fire pump application), or engines in a Locomotive application, or Uninterruptible Power Supply (UPS) systems, the warranty period is 12 months after date of delivery to the first user.
- For engines used in petroleum fire pump and mobile agriculture applications the warranty period is 24 months after date of delivery to the first user.
- For controls only (EPIC), configurable and custom switchgear products, and automatic transfer switch products, the warranty period is 24 months after date of delivery to the first user.
- For new CG132, CG170 and CG260 series power generation products the warranty period is 24 months/16,000 hours, whichever comes first, after date of delivery to first user.
- For electric power generation products other than CG132, CG170 and CG260 series in prime or continuous applications the warranty period is 12 months. For standby applications the warranty period is 24 months/1000 hours. For emergency standby applications the warranty period is 24 months/400 hours. All terms begin after date of delivery to the first user.
- For Caterpillar rebuild electric power generation products the warranty period is 12 months, but not to exceed 24 months from shipment of rebuilt electric power generation product from Caterpillar.
- For all other applications the warranty period is 12 months after date of delivery to the first user.

Caterpillar Responsibilities

If a defect in material or workmanship is found during the warranty period, Caterpillar will, during normal working hours and at a place of business of a Cat dealer or other source approved by Caterpillar:

- Provide (at Caterpillar's choice) new, Remanufactured, or Caterpillar approved repaired parts or assembled components needed to correct the defect.

Note: New, remanufactured, or Caterpillar approved repaired parts or assembled components provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product in which installed as if such parts were original components of that product. Items replaced under this warranty become the property of Caterpillar.

- Replace lubricating oil, filters, coolant, and other service items made unusable by the defect.
- Provide reasonable and customary labor needed to correct the defect, including labor to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems, if required.

For new 3114, 3116, and 3126 engines and, new and Caterpillar rebuild electric power generation products (which includes the following: any new products of other manufacturers packaged and sold by Caterpillar)

- Provide travel labor, up to four hours round trip, if in the opinion of Caterpillar, the product cannot reasonably be transported to a place of business of a Cat dealer or other source approved by Caterpillar (travel labor in excess of four hours round trip, and any meals, mileage, lodging, etc. is the user's responsibility).

For all other products:

- Provide reasonable travel expenses for authorized mechanics, including meals, mileage, and lodging, when Caterpillar chooses to make the repair on-site.

User Responsibilities

The user is responsible for:

- Providing proof of the delivery date to the first user.
- Labor costs, except as stated under "Caterpillar Responsibilities," including costs beyond those required to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems.
- Travel or transporting costs, except as stated under "Caterpillar Responsibilities."
- Premium or overtime labor costs.
- Parts shipping charges in excess of those that are usual and customary.
- Local taxes, if applicable.
- Costs to investigate complaints, unless the problem is caused by a defect in Caterpillar material or workmanship.
- Giving timely notice of a warrantable failure and promptly making the product available for repair.
- Performance of the required maintenance (including use of proper fuel, oil, lubricants, and coolant) and items replaced due to normal wear and tear.
- Allowing Caterpillar access to all electronically stored data.

Limitations

Caterpillar is not responsible for:

- Failures resulting from any use or installation that Caterpillar judges improper.
- Failures resulting from attachments, accessory items, and parts not sold or approved by Caterpillar.
- Failures resulting from abuse, neglect, and/or improper repair.
- Failures resulting from user's delay in making the product available after being notified of a potential product problem.
- Failures resulting from unauthorized repairs or adjustments, and unauthorized fuel setting changes.
- Damage to parts, fixtures, housings, attachments, and accessory items that are not part of the engine, Cat Selective Catalytic Reduction System or electric power generation product (including any products of other manufacturers packaged and sold by Caterpillar).
- Repair of components sold by Caterpillar that is warranted directly to the user by their respective manufacturer. Depending on type of application, certain exclusions may apply. Consult your Cat dealer for more information.

(Continued on reverse side…)

This warranty covers every major component of the products. Claims under this warranty should be submitted to a place of business of a Cat dealer or other source approved by Caterpillar. For further information concerning either the location to submit claims or Caterpillar as the issuer of this warranty, write Caterpillar Inc., 100 N. E. Adams St., Peoria, IL USA 61629.

Caterpillar's obligations under this Limited Warranty are subject to, and shall not apply in contravention of, the laws, rules, regulations, directives, ordinances, orders, or statutes of the United States, or of any other applicable jurisdiction, without recourse or liability with respect to Caterpillar.

A) For products operating outside of Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

NEITHER THE FOREGOING EXPRESS WARRANTY NOR ANY OTHER WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED, IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXCEPT CATERPILLAR EMISSION-RELATED COMPONENTS WARRANTIES FOR NEW ENGINES, WHERE APPLICABLE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISION OF MATERIAL AND SERVICES, AS SPECIFIED HEREIN.

CATERPILLAR IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.

For personal or family use engines or electric power generation products, operating in the USA, its territories and possessions, some states do not allow limitations on how long an implied warranty may last nor allow the exclusion or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary by jurisdiction. To find the location of the nearest Cat dealer or other authorized repair facility, call (800) 447-4986. If you have questions concerning this warranty or its applications, call or write:

In USA and Canada: Caterpillar Inc., Engine Division, P. O. Box 610, Mossville, IL 61552-0610, Attention: Customer Service Manager, Telephone (800) 447-4986. Outside the USA and Canada: Contact your Cat dealer.

B) For products operating in Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

T**HIS WARRANTY IS IN ADDITION TO WARRANTIES AND CONDITIONS IMPLIED BY STATUTE AND OTHER STATUTORY RIGHTS AND OBLIGATIONS THAT BY ANY APPLICABLE LAW CANNOT BE EXCLUDED, RESTRICTED OR MODIFIED ("MANDATORY RIGHTS"). ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED (BY STATUTE OR OTHERWISE), ARE EXCLUDED. WITHOUT LIMITING THE FOREGOING PROVISIONS OF THIS PARAGRAPH, WHERE A PRODUCT IS SUPPLIED FOR BUSINESS PURPOSES, THE CONSUMER GUARANTEES UNDER THE CONSUMER GUARANTEES ACT 1993 (NZ) WILL NOT APPLY.**

NEITHER THIS WARRANTY NOR ANY OTHER CONDITION OR WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED (SUBJECT ONLY TO THE MANDATORY RIGHTS), IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

IF THE MANDATORY RIGHTS MAKE CATERPILLAR LIABLE IN CONNECTION WITH SERVICES OR GOODS, THEN TO THE EXTENT PERMITTED UNDER THE MANDATORY RIGHTS, THAT LIABILITY SHALL BE LIMITED AT CATERPILLAR'S OPTION TO (a) IN THE CASE OF SERVICES, THE SUPPLY OF THE SERVICES AGAIN OR THE PAYMENT OF THE COST OF HAVING THE SERVICES SUPPLIED AGAIN AND (b) IN THE CASE OF GOODS, THE REPAIR OR REPLACEMENT OF THE GOODS, THE SUPPLY OF EQUIVALENT GOODS, THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT GOODS.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

CATERPILLAR IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES UNLESS IMPOSED UNDER MANDATORY RIGHTS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.

C) For products supplied in Australia:

IF THE PRODUCTS TO WHICH THIS WARRANTY APPLIES ARE:

- **I. PRODUCTS OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION; OR**
- **II. PRODUCTS THAT COST AUD 40,000 OR LESS,**

WHERE THOSE PRODUCTS WERE NOT ACQUIRED FOR THE PURPOSE OF RE-SUPPLY OR FOR THE PURPOSE OF USING THEM UP OR TRANSFORMING THEM IN THE COURSE OF PRODUCTION OR MANUFACTURE OR IN THE COURSE OF REPAIRING OTHER GOODS OR FIXTURES, THEN THIS SECTION C APPLIES.

THE FOLLOWING MANDATORY TEXT IS INCLUDED PURSUANT TO THE AUSTRALIAN CONSUMER LAW AND INCLUDES REFERENCES TO RIGHTS THE USER MAY HAVE AGAINST THE DIRECT SUPPLIER OF THE PRODUCTS: OUR GOODS COME WITH GUARANTEES THAT CANNOT BE EXCLUDED UNDER THE AUSTRALIAN CONSUMER LAW. YOU ARE ENTITLED TO A REPLACEMENT OR REFUND FOR A MAJOR FAILURE AND COMPENSATION FOR ANY OTHER REASONABLY FORESEEABLE LOSS OR DAMAGE. YOU ARE ALSO ENTITLED TO HAVE THE GOODS REPAIRED OR REPLACED IF THE GOODS FAIL TO BE OF ACCEPTABLE QUALITY AND THE FAILURE DOES NOT AMOUNT TO A MAJOR FAILURE. THE INCLUSION OF THIS TEXT DOES NOT CONSTITUTE ANY REPRESENTATION OR ACCEPTANCE BY CATERPILLAR OF LIABILITY TO THE USER OR ANY OTHER PERSON IN ADDITION TO THAT WHICH CATERPILLAR MAY HAVE UNDER THE AUSTRALIAN CONSUMER LAW.

TO THE EXTENT THE PRODUCTS FALL WITHIN THIS SECTION C BUT ARE NOT OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION, CATERPILLAR LIMITS ITS LIABILITY TO THE EXTENT IT IS PERMITTED TO DO SO UNDER THE AUSTRALIAN CONSUMER LAW TO, AT ITS OPTION, THE REPAIR OR REPLACEMENT OF THE PRODUCTS, THE SUPPLY OF EQUIVALENT PRODUCTS, OR THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT PRODUCTS.

THE WARRANTY SET OUT IN THIS DOCUMENT IS GIVEN BY CATERPILLAR INC. OR ANY OF ITS SUBSIDIARIES, 100 N. E. ADAMS ST, PEORIA, IL USA 61629, TELEPHONE 1 309 675 1000, THE USER IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH MAKING A CLAIM UNDER THE WARRANTY SET OUT IN THIS DOCUMENT, EXCEPT AS EXPRESSLY STATED OTHERWISE IN THIS DOCUMENT, AND THE USER IS REFERRED TO THE BALANCE OF THE DOCUMENT TERMS CONCERNING CLAIM PROCEDURES, CATERPILLAR RESPONSIBILITIES AND USER RESPONSIBILITIES.

TO THE EXTENT PERMISSIBLE BY LAW, THE TERMS SET OUT IN THE REMAINDER OF THIS WARRANTY DOCUMENT (INCLUDING SECTION B) CONTINUE TO APPLY TO PRODUCTS TO WHICH THIS SECTION C APPLIES.

ELECTRIC POWER EXTENDED SERVICE COVERAGE

Backed by the Power of Cat

Whether you need Prime Power or Standby, you can protect your Electric Power solution with Extended Service Coverage (ESC) from the Caterpillar® dealer network.

Your ESC provides 100 percent of usual and customary parts and labor costs for engine failures due to defect in materials and workmanship on covered components.

COVERAGE THAT IS RIGHT FOR YOU

Prime Power Coverage

Platinum coverage - this includes all original factory equipment with Cat part numbers, excluding consumables such as filters, hoses and belts.

Standby Power Coverage

Select the level of coverage that meets your need.
Silver coverage includes a wide range of covered components and you have confidence that ESC repairs will be done by trained professionals who use genuine Cat® parts.
Gold coverage includes all the same items as silver, as well as turbochargers, injectors and water pumps.
Platinum coverage for Standby units (over three liters) also covers generator rental expenses up to $20,000 per occurrence, if the unit is down for more than 48 hours for a covered repair.

Extended Service Coverage for Electric Power is available everywhere in the world. So whether your unit remains in one location or is mobile around the globe, the Cat dealer network is available to serve you.

COVERAGE AVAILABLE FOR THE LONG TERM

An ESC from the Caterpillar dealer network can protect your Electric Power unit for up to 5 years. You can choose from a variety of coverage terms.

COVERAGE FOR YOUR FULLY INTEGRATED CAT POWER SOLUTION

You turn to Cat for a total Electric Power solution, and you can select an ESC to cover it. See your Cat dealer today.

CATERPILLAR®

Electric Power Coverage Matrix

Platinum Level Coverage Components: All as shipped consist from the factory with Caterpillar part numbers excluding filters, fluids, vee belts, hoses, power take-offs, paint, batteries and clutches. Also for power modules, coverage excludes containers, undercarriage, ladders, lights, wheels, axles, brakes, tires, stabilizing jacks and fire extinguishers.

Item	Silver	Gold
COOLING SYSTEM		
Thermostat Housing	Yes	Yes
Water Manifold Housing	Yes	Yes
Jacket Water Precooler	Yes	Yes
Jacket Water Pump	No	Yes
FUEL SYSTEM		
Steel Fuel Lines	Yes	Yes
Fuel Shutoff Solenoid	Yes	Yes
Fuel Injectors	No	Yes
LUBRICATION SYSTEM		
Oil Pan	Yes	Yes
Engine Oil Pump	Yes	Yes
Oil Cooler Housing & Core / Bonnet	Yes	Yes
Oil Filter Base	Yes	Yes
ELECTRONIC SYSTEM		
Electronic Control Module (ECM)	Yes	Yes
Sensors: all engine sensors	Yes	Yes
FRONT AND REAR COVERS		
Front Covers / Plate / Housing / Gears & Gaskets	Yes	Yes
Vibration Damper	Yes	Yes
Flywheel Housing & Gasket	Yes	Yes
MISCELLANEOUS		
Cat Bolts, Attaching Covered Components	Yes	Yes
GENERATOR END		
Entire Generator End	Yes	Yes
Generator Controls (EMCP, Wiring)	Yes	Yes
AIR INDUCTION & EXHAUST		
Exhaust Manifolds, Studs & Gaskets	Yes	Yes
Inlet Air Heater Relay	Yes	Yes
Intake Manifold	Yes	Yes
Turbocharger (mounting hardware, lines, wastegate)	No	Yes
SHORT BLOCK		
Cylinder Block Casting	Yes	Yes
Freeze Plugs	Yes	Yes
Crankshaft	Yes	Yes
Crankshaft Rod, Main & Thrust Bearings	Yes	Yes
Connecting Rod Assembly	Yes	Yes
Piston, Wrist Pin, Retainer Clip & Piston Rings	Yes	Yes
Piston Cooling Jet Tubes	Yes	Yes
Cylinder Liner, Seals & Filler Band	Yes	Yes
Main Bearing Cap Bolts	Yes	Yes
CYLINDER HEAD		
Cylinder Head Casting, Sleeves, Bolts & Gaskets	Yes	Yes
Freeze Plug	Yes	Yes
Spacer Plate & Spacer Plate Gasket	Yes	Yes
Intake & Exhaust Valve (all related components)	Yes	Yes
Roller Follower	Yes	Yes
Valve Mechanism, Rocker Arm, Brackets, Push, Tube, Bridge Dowels, Adjusting Screws, Nuts & Shaft	Yes	Yes
Valve Cover & Base	Yes	Yes
Camshaft, Camshaft Bearings, Key, Gear	Yes	Yes
Camshaft Rear Cover / Seal	Yes	Yes

SILVER and GOLD Level Coverage Components

All engine covered components listed plus base radiator, fuel tank, generator-mounted control panel, generator rotor & stator, bearings, exciter, EMCP Module, voltage regulator, and start/stop module. EPG Power Module - All Generator Set covered components listed above plus transfer switch and/or switchgear as shipped from the factory.

Travel & Mileage Limitations:

For Caterpillar generator sets up to and including 7 liter displacement, for ATS models up to and including 1,200 amperes and for all Olympian products

- Up to 4 hours and 0 miles / 0 kilometers travel allowance

For all other models

- Up to 8 hours and 320 miles / 515 kilometers travel allowance

Important Notice:

All Covered Components must pass inspection or be replaced at the proper intervals by an authorized dealer as prescribed in the Manufacturer's Operation and Maintenance Manual to qualify for continued coverage under this contract. **Failure to follow the Manufacturer's Operation and Maintenance Manual will result in denial of claims.**

Additional coverage for Cat Standby Generator Sets over 3 liter displacement with Platinum Level Extended Coverage: Additional coverage is allowed if repairs can not be completed within 48 hours of the authorized dealer technician's initial visit for a covered mechanical breakdown due solely to the nature of the mechanical breakdown or Cat's inability to supply the required repair components. Up to $20,000 (US$) is allowed for rental genset expenses that are hereby defined as the reasonable and customary rental charge, mileage per guidelines given in the repairer travel & mileage limitations section of this contract and the necessary labor for connection & disconnection to your facility of the Rental GenSet from an authorized dealer.

This is a brief description of Extended Coverage. See your Cat dealer for more information. The Extended Coverage contract will govern.

Note: components not listed in the coverage matrix are not covered under Silver or Gold level coverage options.

CATERPILLAR®

LEYE5135-03

NC POWER SYSTEMS

SECTION 2

CATERPILLAR CUT/DATA SHEETS

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Image shown may not reflect actual configuration

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

Specifications

Generator Set Specifications	
Rating	40 ekW (50 kVA)
Voltage	208 Volts
Frequency	60 Hz
Speed	1800 rpm

Generator Set Configurations	
Emissions/Fuel Strategy	U.S. EPA Certified for Stationary Emergency Application (Meets nonroad U.S. EPA Tier 3 equivalent emission standards)

Engine Specifications		
Engine Model	C4.4 In-line 4, 4-cycle diesel	
Bore	105.0 mm	4.13 in
Displacement	4.4 L	268.5 in³
Stroke	127.0 mm	5.0 in
Compression Ratio	18.2:1	
Aspiration	Turbocharged	
Governor Type	Electronic	
Fuel System	Mechanical	

Package Dimensions*		
Length	1972 mm	77.6 in
Width	1000 mm	39.4 in
Height	1175 mm	46.3 in
Weight†	861 kg	1898 lb

*Note: For reference only – do not use for installation design. Please contact your local dealer for exact weight and dimensions.
†Weight includes: Oversize generator, skid base, circuit breaker, oil, and coolant.

Benefits & Features

Cat® Diesel Engine

- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Four-stroke cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight

Generator

- Matched to the performance and output characteristics of Cat engines
- Industry-leading mechanical and electrical design
- Industry-leading motor starting capabilities
- High efficiency

Cat EMCP Control Panel

The EMCP controller features the reliability and durability you have come to expect from your Cat equipment. EMCP 4 is a scalable control platform designed to ensure reliable generator set operation, providing extensive information about power output and engine operation. EMCP 4 systems can be further customized to meet your needs through programming and expansion modules.

Seismic Certification

- Seismic certification available
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength
- IBC certification requires that the anchoring system used is reviewed and approved by a professional engineer
- Seismic certification per applicable building codes: IBC 2006, IBC 2009, IBC 2012, IBC 2015

Design Criteria

- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response
- Cooling system designed to operate in 50˚C/122˚F ambient temperatures with an air flow restriction of 0.5 in. water

UL 2200/CSA – Optional

- UL 2200 Listed
- CSA Certified

Certain restrictions may apply. Consult with your Cat dealer.

Single-Source Supplier

Fully prototype tested with certified torsional vibration analysis.

Worldwide Product Support

Cat dealers provide extensive post-sale support including maintenance and repair agreements. Cat dealers have over 1,800 dealer branch stores operating in 200 countries. The Cat S•O•S℠ program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products.

Standard Equipment

Air Inlet

- Dry replaceable paper element type with restriction indicator

Cooling

- Radiator and cooling fan complete with protective guards
- Standard ambient temperatures up to 50°C (122°F)

Exhaust

- Exhaust flange outlet

Fuel

- Primary and secondary fuel filters
- Fuel priming pump
- Flexible fuel lines

Generator

- Matched to the performance and output characteristics of Cat engines
- Load adjustment module provides engine relief upon load impact and improves load acceptance and recovery time
- IP23 protection
- Integrated Voltage Regulation

Governor

- Electronic governor

Control Panels

- EMCP 4.2 Series generator set controller

Mounting

- Rubber vibration isolators

Starting/Charging

- 12 volt starting motor
- Batteries with rack and cables

General

- Paint – Caterpillar Yellow except rails and radiators gloss black

Optional Equipment

Generator

- Excitation: [ ] Permanent Magnet Excited (PM) [ ] Internally Excited (IE)
- Oversize and premium generators

Starting/Charging

- Battery charger – UL 10 amp
- Battery disconnect switch
- Battery removal (does not remove rack and cables)
- Jacket water heater

General

- UL 2200
- CSA Certification
- Enclosures: sound attenuated, weather protective
- Integral or sub-base dual wall UL Listed fuel tanks
- Automatic transfer switches (ATS)

C4.4
40 ekW/ 50 kVA/ 60 Hz/ 1800 rpm/ 208V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: U.S. EPA Certified for Stationary Emergency Application (Meets nonroad U.S. EPA Tier 3 equivalent emission standards)

Image shown may not reflect actual configuration

D40-2LC
40 ekW/ 50 kVA 60Hz/
1800 rpm/ 208V

Package Performance	
Generator Set Power Rating with Fan @ 0.8 Power Factor	40 ekW
Generator Set Power Rating	50 kVA

Fuel Consumption		
100% Load With Fan	13.9 L/hr	3.7 gal/hr
75% Load With Fan	10.8 L/hr	2.9 gal/hr
50% Load With Fan	8.1 L/hr	2.1 gal/hr

Cooling System[1]		
Engine Coolant Capacity	7.0 L	1.8 gal
Radiator Coolant Capacity	9.5 L	2.5 gal
Engine Coolant Capacity with Radiator/Exp Tank	16.5 L	4.4 gal
Air Flow Restriction (System)	0.12 kPa	0.48 in. water

Inlet Air		
Combustion Air Inlet Flow Rate	5.3 m³/min	187.2 cfm

Exhaust System		
Exhaust Stack Gas Temperature	571°C	1060°F
Exhaust Gas Flow Rate	13.7 m³/min	483.8 cfm
Exhaust System Backpressure (maximum allowable)	15.0 kPa	60.2 in. water

Rating Type: STANDBY

Emissions: U.S. EPA Certified for Stationary Emergency Application (Meets nonroad U.S. EPA Tier 3 equivalent emission standards)

Heat Rejection		
Heat Rejection to Coolant (total)	46.1 kW	2622 Btu/min
Heat Rejection to Exhaust (total)	66.9 kW	3805 Btu/min
Heat Rejection to Atmosphere from Engine	14.9 kW	847.3 Btu/min
Heat Rejection to Atmosphere from Generator	4.7 kW	267.3 Btu/min

Alternator[2]		
Motor Starting Capability @ 30% Voltage Dip	105 skVA	
Frame	LC1514J	
Temperature Rise	130°C	234°F
Excitation	Self Excited	

Lube System		
Sump Refill with Filter	8.4 L	2.2 gal

Emissions (Nominal)[3]	
NOx + HC	4.42 g/kW-hr
CO	1.02 g/kW-hr
PM	0.26 g/kW-hr

[1] For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to the existing restriction from the factory.

[2] Generator temperature rise is based on a 40°C (104°F) ambient per NEMA MG1-32.

[3] The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% Prime load.

C4.4
40 ekW/ 50 kVA/ 60Hz/ 1800 rpm/ 208V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: U.S. EPA Certified for Stationary Emergency Application (Meets nonroad U.S. EPA Tier 3 equivalent emission standards)

DEFINITIONS AND CONDITIONS

Applicable Codes and Standards:
AS1359, CSA C22.2 No 100-04, UL142, UL489, UL601, UL869, UL2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC,IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, 72/23/EEC, 98/37/EC, 2004/108/EC.

STANDBY: Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.

Fuel Rates are based on fuel oil to specification EPA 2D 89.330-96 with a density of 0.845 – 0.850 kg/L (7.052 – 7.094 lbs/U.S. gal.) @ 15°C (59°F) and fuel inlet temperature 40°C (104°F).

Additional ratings may be available for specific customer requirements, contact your Cat representative for details.

Performance No.: P3454C-00
Feature Code: NAC147P
Generator Arrangement:4676043
Date: 09/23/2019
Source Country: U.S.

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www.Cat-ElectricPower.com

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EMCP 4.2B GENERATOR SET CONTROLLER

The Cat® EMCP 4.2B offers fully featured power metering, protective relaying and engine and generator control and monitoring. Engine and generator controls, diagnostics, and operating information are accessible via the control panel keypads; diagnostics from the EMCP 4 optional modules can be viewed and reset through the EMCP 4.2B.

Full range of attachments

- Wide range of system expansion attachments, designed specifically to work with the EMCP 4
- Flexible packaging options for easy and cost effective installation

World wide product support

- Cat dealers provide extensive pre and post sale support
- Cat dealers have over 1,600 dealer branch stores operating in 200 countries

Features

- A 33 x 132 pixel, 3.8 inch, white backlit graphical display denotes text alarm/event descriptions, set points, engine and generator monitoring, and is visible in all lighting conditions.
- Textual display with support for 26 languages
- Advanced engine monitoring is available on systems with an ADEM™ controller.
- Integration with the CDVR and IVR provides enhanced system performance
- Fully featured power metering, protective relaying, engine and generator parameter viewing, and expanded AC metering are all integrated into this controller.
- Real-time clock allows for date and time stamping of diagnostics and events in the control's logs as well as service maintenance reminders based on engine operating hours or calendar days. Up to 40 diagnostic events are stored in the non-volatile memory

Features

- Ability to view and reset diagnostics on EMCP 4 optional modules via the control panel removes the need for a separate service tool for troubleshooting
- Set points and software stored in non-volatile memory, preventing loss during a power outage
- Five levels of security allow for configurable operator privileges
- Programmable security levels for groups of setpoints.
- Programmable kW Relays (3)
- Programmable weekly exerciser timer
- Dealer configurable resistive maps
- Default overview screen
- Real (kW) Load histogram
- Auto mains failure
- Programmable logic functionality
- Selectable units
    - Temperature: °C or °F
    - Pressure: psi, kPa, bar
    - Fuel Consumption: Liter/hr or Gal/hr (U.S. or U.K.)

Standard Features

- Voltage (L-L, L-N)
- Current (Phase)
- Average Volt, Amp, Frequency
- kW, kVAr, kVA (Average, Phase, %)
- Power Factor (Average, Phase)
- kW-hr, kVAr-hr (total)
- Excitation voltage and current (with CDVR)
- Desired Voltage, Excitation Command, Operating Mode (with IVR)
- Generator stator and bearing temp (with optional module)
- kW load histogram

Generator Protection

- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under frequency (81 O/U)
- Reverse Power (kW) (32)
- Reverse Reactive Power (kVAr) (32RV)
- Overcurrent (50/51)
- Thermal Damage Curve

Engine Monitoring

- Coolant temperature
- Oil pressure
- Engine speed (RPM)
- Battery voltage
- Run hours
- Crank attempt and successful start counter
- Enhanced engine monitoring (with electronic engines)

Engine Protection

- Control switch not in auto (alarm)
- High coolant temp (alarm and shutdown)
- Low coolant temp (alarm)
- Low coolant level (alarm)
- High engine oil temp (alarm and shutdown)
- Low, high, and weak battery voltage
- Overspeed
- Overcrank
- Low Oil Pressure

Control

- Run / Auto / Stop control
- Speed and voltage adjust
- Local and remote emergency stop
- Remote start/stop
- Cycle crank

Inputs & Outputs

- Two dedicated digital inputs
- Three analog inputs
- Six programmable digital inputs
- Eight relay out
- Two programmable digital outputs

Communications

- Primary and accessory CAN data links
- RS-485 annunciator data link
- Modbus RTU (RS-485 Half duplex)

Language Support

Arabic, Bulgarian, Czech, Chinese, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Icelandic, Japanese, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish, Turkish

Environmental

- Control module operating temperature: -40°C to 70°C
- Display operating temperature: -20°C to 70°C
- Humidity: 100% condensing 30°C to 60°C
- Storage temperature: -40°C to 85°C
- Vibration: Random profile, 24-1000 Hz, 4.3G rms

Standards

- UL Recognized
- CSA C22.2 No.100,14, 94
- Complies with all necessary standards for CE Certification
    - 98/37/EC Machinery Directive
    - BS EN 60204-1 Safety of Machinery 89/336/EEC EMC Directive
    - BS EN 50081-1 Emissions Standard
    - BS EN 50082-2 Immunity Standard 73/23/EEC Low Voltage Directive
    - EN 50178 LVD Standard
- IEC529, IEC60034-5, IEC61131-3
- MIL STND 461

Engine Controller

ADEM™ A4 Engine Controller

The ADEM™ A4 is the main Electronic Control Module (ECM) used on select diesel engines. The ADEM A4 provides a higher degree of control over a large number of combustion variables. The ADEM A4 is designed to control/interface Electronic Unit Injector (EUI) equipped engines. The ADEM A4 engine system is composed of the ADEM A4 ECM, control software, sensors, actuators, fuel injectors, and interface to the generator system. The prime benefit of an ADEM A4 engine system is to better control and maintain the particulate emissions, both steady state and transient, while improving engine performance.

Features

Reliable, Durable

All ADEM A4 controllers are designed to survive the harshest environments.

- Environmentally sealed, die-cast aluminum housing solates and protects electronic components from moisture and dirt contamination
- Rigorous vibration testing ensures product reliability and durability
- Accuracy maintained from –40°C to 85°C
- Electrical noise immunity to 100 volts / meter
- Internal circuits are designed to withstand shorts to + battery and – battery

Simple Servicing

Each ADEM A4 system works in combination with the Cat® ET service tool software to keep the engine operating at peak performance.

- Displays measured parameters
- Retrieves active and logged event code documenting abnormal system operation
- Performs calibrations and diagnostic tests
- Supports flash programming of new software into the ADEM A4 ECM

Self Diagnostics

Each ADEM A4 ECM has a full compliment of diagnostics. The ECM can detect faults in the electrical system and report those faults to the service technician for quick repair.

- Self-diagnostic capability pinpoints operational prob-lems in need of attention.

Advanced Features

- Enhanced performance from fuel injection timing and limiting
- Adjustable monitoring of vital engine parameters
- Programmable speed acceleration ramp rate
- Data link interfaces

Description

The ECM is housed in an environmentally sealed cast-ing. All wiring connections to the ECM are made using two sealed connectors: a single seventy-pin connector and a single one hundred twenty-pin connector.

Engine Speed Governing

Desired engine speed is calculated by the ECM and held within ±0.2 Hz for isochronous and droop mode. The ECM accounts for droop that is requested. The proper amount of fuel is sent to the injectors due to these calculations. The ECM also employs cooldown/shutdown strategies, acceleration delays on startup, acceleration ramp times and speed reference.

Fuel Limiting

Warm and cold fuel-air ratio control limits are con-trolled by the ECM. Electronic monitoring system derates, torque limit, and cranking limit, programmable torque scaling, and cold cylinder cutout mode are standard features.

Fuel Injection Timing

Master timing for injection is controlled by the ECM control. Temperature dependencies are accounted for in the fuel injection calculations.

Electronic Monitoring

Electronic monitoring of vital engine parameters can be programmed. Warning, derate, and shutdown event conditions may be customized by the user.

Information Management

The ECM stores information to assist with electronic troubleshooting. Active and logged diagnostic codes, active events, logged events, fuel consumption, engine hours, and instantaneous totals aid service technicians when diagnosing electronic faults and scheduling preventive maintenance.

Calibrations

Engine performance is optimized through injection timing. Auto/manual sensor calibrations are standard features.

On-Board System Tests

System tests are available to assist in electronic trou-bleshooting. These tests include: injector activation, injector cutout, and override of control outputs.

Data Link Interfaces

The ADEM A4 communicates with the EMCP via a dedicated communication network.

Electronic Sensing

The following sensing is available on the ADEM A4: oil pressure, fuel pressure, fuel temperature, atmospheric pressure, air inlet temperature, turbo outlet pressure, engine coolant temperature, engine speed, throttle, position, exhaust temperature, oil filter pressure differential, fuel filter pressure differential, air filter pressure differential and crankcase pressure.

Engine Controller

SPECIFICATIONS

Impervious to:

Salt spray, fuel, oil and oil additives, coolant, spray cleaners, chlorinated solvents, hydrogen sulfide and methane gas, and dust.

Input and output protection

All inputs and outputs are protected against short circuits to +battery and –battery

Input voltage range (24 VDC nominal)

18 to 32 VDC

Mounting

Engine mounted

Reverse polarity protected

Shock, withstands 20g

Temperature range

Operating: –40°C to 85°C (–40°F to 185°F)
Storage: –50°C to 120°C (–58°F to 248°F)

Vibration

Withstands 8.0g @ 24 to 2 kHz

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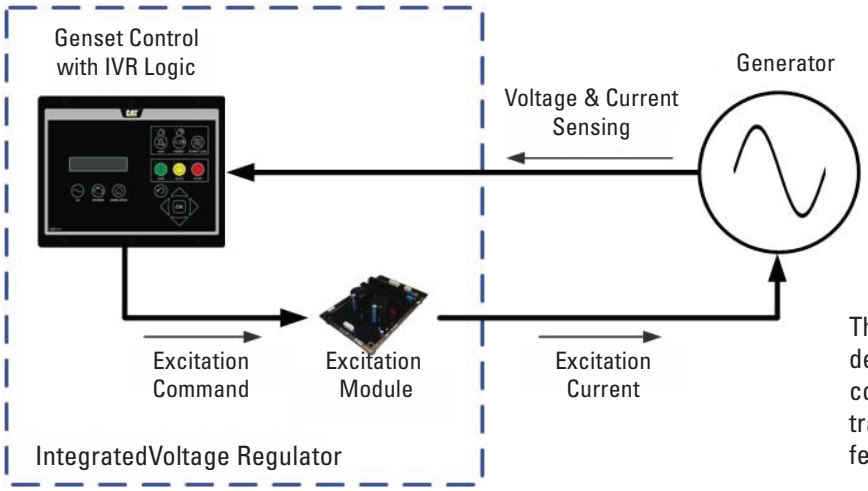
INTEGRATED VOLTAGE REGULATOR



INTEGRATED VOLTAGE REGULATOR

The Integrated Voltage Regulator (IVR) is designed to provide robust, precise closed-loop control of the generator voltage, optimized transient performance and industry leading feature specification.

Caterpillar is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness.

FEATURES

When used with an Excitation Module, EMCP 4.3/4.4 and IVR-compatible EMCP 4.1/4.2 (B) controllers offers:

- Automatic Voltage Regulation (AVR)
- Programmable stability settings
- Soft start control with an adjustable time setting in AVR control mode
- Dual Slope, Configurable Under Frequency (Volts/Hz) regulation
- Three-phase or single-phase generator voltage (RMS) sensing/regulation in AVR mode
- Setpoint adjustment from the EMCP display or Cat ET ServiceTool
- IVR Operating Status and Voltage Bias Overview screens to provide an enhanced level of user interface
- Integrated Voltage Regulator event monitoring

EMCP 4.3/4.4 and IVR-compatible EMCP 4.2 (B) controllers also offer:

- Power Factor Regulation (PF)
- Reactive Droop compensation
- Line drop compensation

WORLDWIDE PRODUCT SUPPORT

- Worldwide parts availability through the Cat dealer network
- Over 1,800 dealer branch stores operating in 200 countries
- The best product support record in the industry
- Cat dealers provide extensive post sale support including maintenance and repair agreements

COMPLETE SYSTEM INTEGRATION

Fully designed and factory tested to work seamlessly with Cat generators using Self Excitation (SE), Internal Excitation (IE) or Permanent Magnet (PMG) excitation systems and EMCP controls.

INTEGRATED VOLTAGE REGULATOR

INTEGRATED VOLTAGE REGULATOR FEATURE SPECIFICATION

	EMCP 4.1	EMCP 4.2(B)	EMCP 4.3	EMCP 4.4
				
SPECIFICATIONS				
No Load to Full Load Regulation	±0.5%	±0.25%	±0.25%	±0.25%
Configurable Volts / Hz Characteristic	•	•	•	•
Configurable Knee Frequency	•	•	•	•
Regulator ResponseTime	10 ms	10 ms	5 ms	5 ms
Single and Three Phase Sensing	•	•	•	•
Voltage Adjustment Range	± 30%	± 30%	± 30%	± 30%
CONTROL				
Characteristic	•	•	•	•
Excitation Enable I Disable Selection	•	•	•	•
Line Loss (I^2R) Compensation	–	•	•	•
Reactive Droop Compensation	–	•	•	•
Power Factor Control Mode	–	•	•	•
PROTECTION I ALARMS				
Generator Overvoltage	•	•	•	•
Generator Under voltage	•	•	•	•
Over Excitation	•	•	•	•
Loss of Sensing	•	•	•	•
Generator Reverse VARs	–	•	•	•
Event Log	•	•	•	•
METERING				
EMCP AC Metering	•	•	•	•
EMCP Power Metering	–	•	•	•
Excitation Command Percentage	•	•	•	•
Operating Mode Status 1ndication	•	•	•	•
VOLTAGE ADJUSTMENT				
EMCP 4 Display Voltage Bias	•	•	•	•
Digital Input (Raise I Lower) Voltage Bias[1]	•	•	•	•
Potentiometer Voltage Bias[1]	•	•	•	•
Analog Voltage Bias -Voltage Range[1]	0V to SV	0V to SV	-10V to +10V	-10V to +10V
Analog Voltage Bias - Current Range[1]	-	-	0mA to 20mA	0mA to 20mA
Analog Voltage Bias - PWM Range[1]	-	-	0% to 100%	0% to 100%
SCADA (Modbus) Voltage Bias	-	•	•	•

[1]Requires an available input on the EMCP 4.

EMCP 4 DISPLAY

EXAMPLE SCREENS - EMCP 4.1/4.2

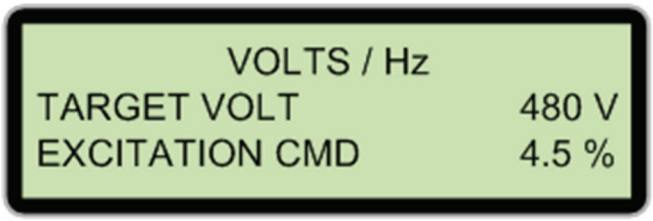


Figure 3: IVR Overview Screen

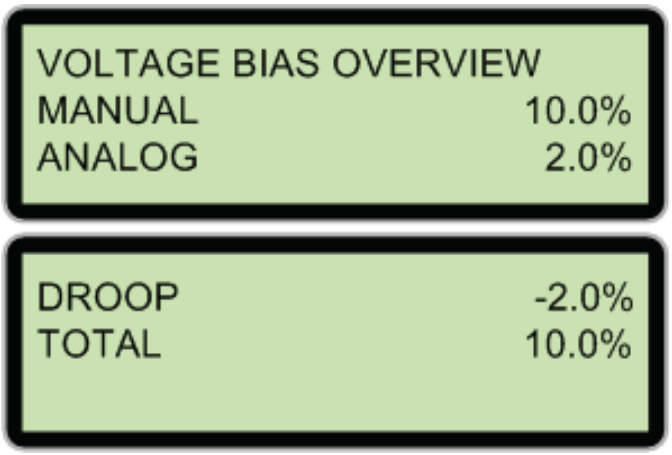


Figure 4: Voltage Bias Overview Screens

EXAMPLE SCREENS - EMCP 4.3/4.4

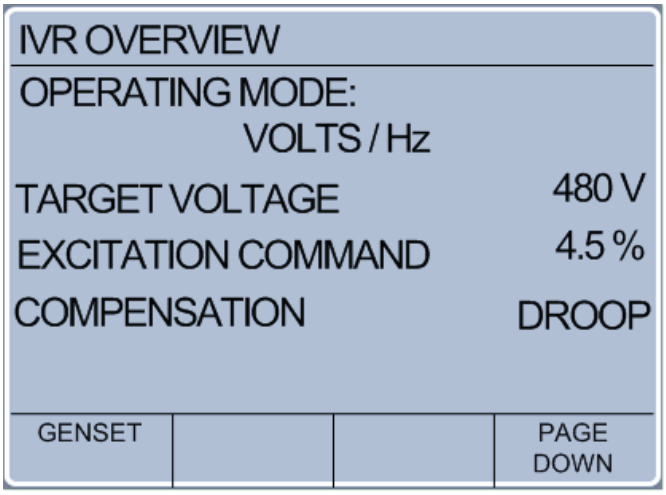


Figure 5: IVR Overview Screen

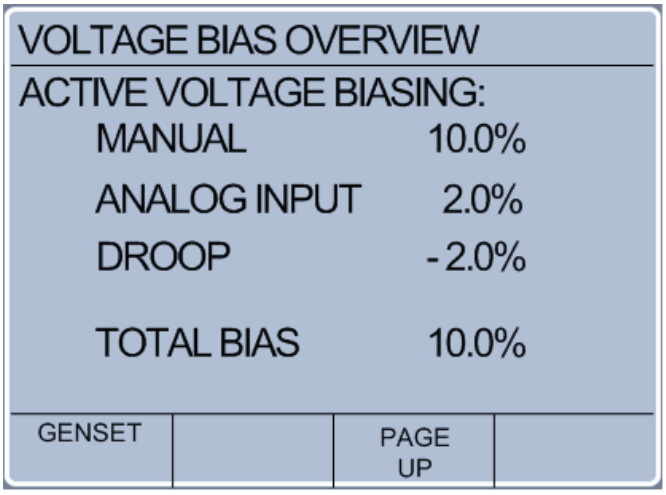


Figure 6: Voltage Bias Overview Screen

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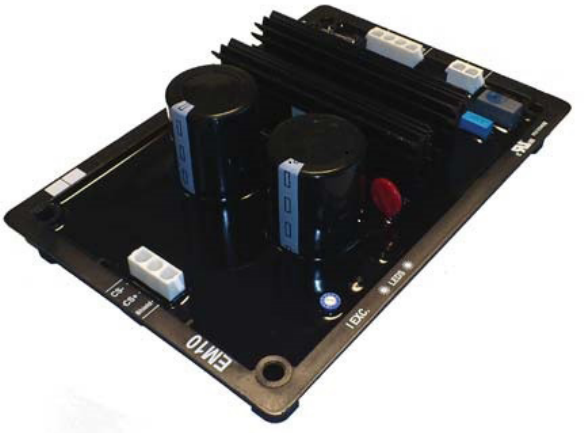
Excitation Module



EM10

The EM10 Excitation Module is a power electronics component designed to provide excitation current to the generator that is controlled by the Integrated Voltage Regulator (IVR) feature in the EMCP 4 controls.

Caterpillar is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness

Features

- Over-excitation protection – limit can be adjusted via a potentiometer (IEXC)
- Green status LED indicating unit is powered on
- Red status LED indicating excitation current limiting (flashing) or shutdown (solid)

When used with EMCP 4.3 / 4.4 and IVR-compatible EMCP 4.1 / 4.2 controllers, the Integrated Voltage Regulator system offers:

- Automatic Voltage Regulation (AVR)
- Programmable stability settings
- Soft start control with an adjustable time setting in AVR control mode
- Dual Slope Under Frequency (Volts / Hz) regulation
- 3 Phase or single-phase generator voltage (RMS) sensing / regulation in AVR mode

EMCP 4.3 / 4.4 and IVR-compatible EMCP 4.2 controllers also offer:

- Power Factor Regulation (PF)
- Generator paralleling with reactive droop compensation
- Line drop compensation

Worldwide Product Support

- Worldwide parts available through the Cat® dealer network
- Over 1,800 dealer branch stores operating in 200 countries
- The best product support record in the industry
- Cat dealers provide extensive post sale support including maintenance and repair agreements

Complete System Integration

Fully designed and factory tested to work seamlessly with Cat generators using Self Excitation (SE), Internal Excitation (IE) or Permanent Magnet (PMG) excitation systems and EMCP controls.

Excitation Module – EM10

Specifications	
Electrical	
Generator Excitation Types	Self Excitation / Internal Excitation / Permanent Magnet (PMG)
Max. Continuous Field Current Output	6 Amps
Max. Forcing Field Current Output	10 Amps
Max. AC Voltage Input (X1:X2, Z1:Z2)	180 Vrms

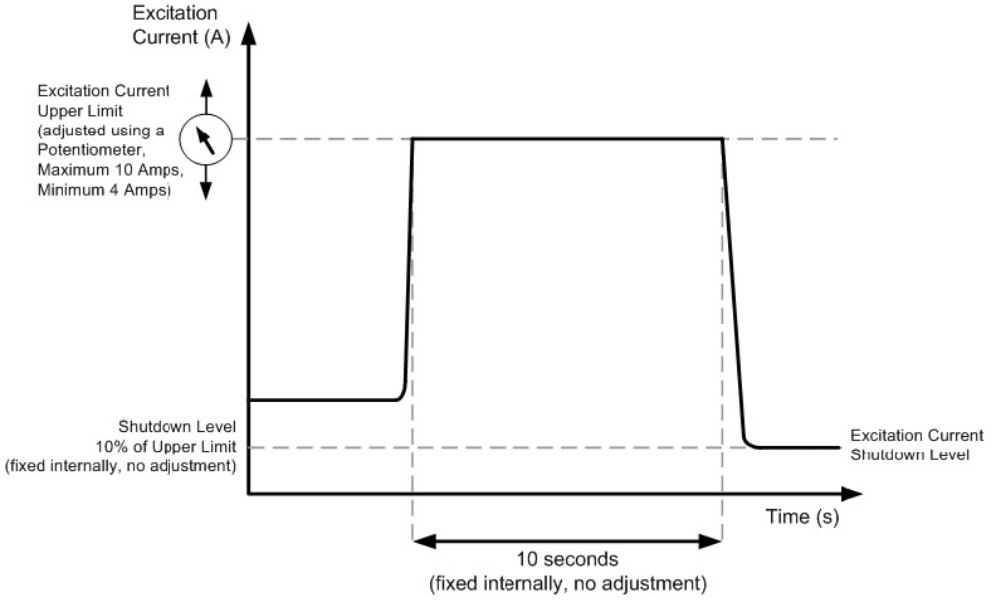
Environmental	
Operating Temperature Range	−40°C (−40°F) to +70°C (+158°F)
Storage Temperature Range	−40°C (−40°F) to +85°C (+185°F)
Relative Humidity Tolerance	95% non-condensing humidity
Salt Spray	5% salt (NaCl) solution for 120 hrs
Vibration	4.5 G-rms, 24-2000 Hz in 3 orthogonal planes
Electromagnetic Compatibility	RF Immunity (Radiated & Conducted) RF Emissions (Radiated & Conducted) Electrical Transients
Weight	770g ±30g
Power Consumption (at Max. Continuous Rating)	450 VA

Conformity	
UL	UL Recognized (U.S. and Canada) File No. E334232
CE Integrated Certificate	In conformity with the applicable requirements of the following Standards: EN 50178 EN 60204-1 EN 61000-6-2 EN 61000-6-4

Excitation Module – EM10

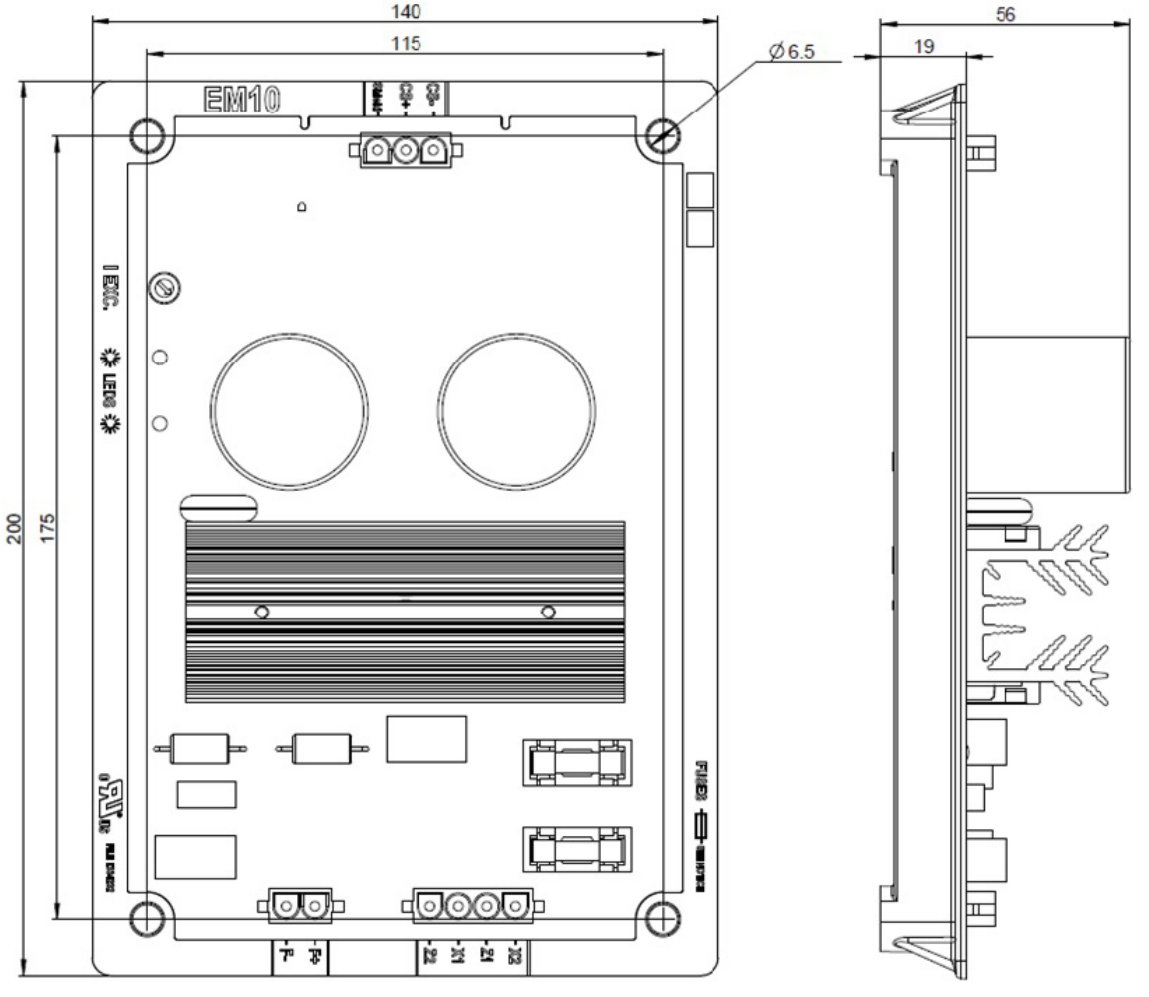
Over-Excitation Protection

- If a short-circuit fault occurs at the generator teminals, the EM10 will allow the excitation current to rise to the upper limit value set by the adjustment potentionmeter (max. 10 Amps).
- The excitation current will be clamped at the upper limit value for 10 seconds (fixed internally).
- After 10 seconds, the excitation current is reduced to a value of 10% of the potentiometer setting.



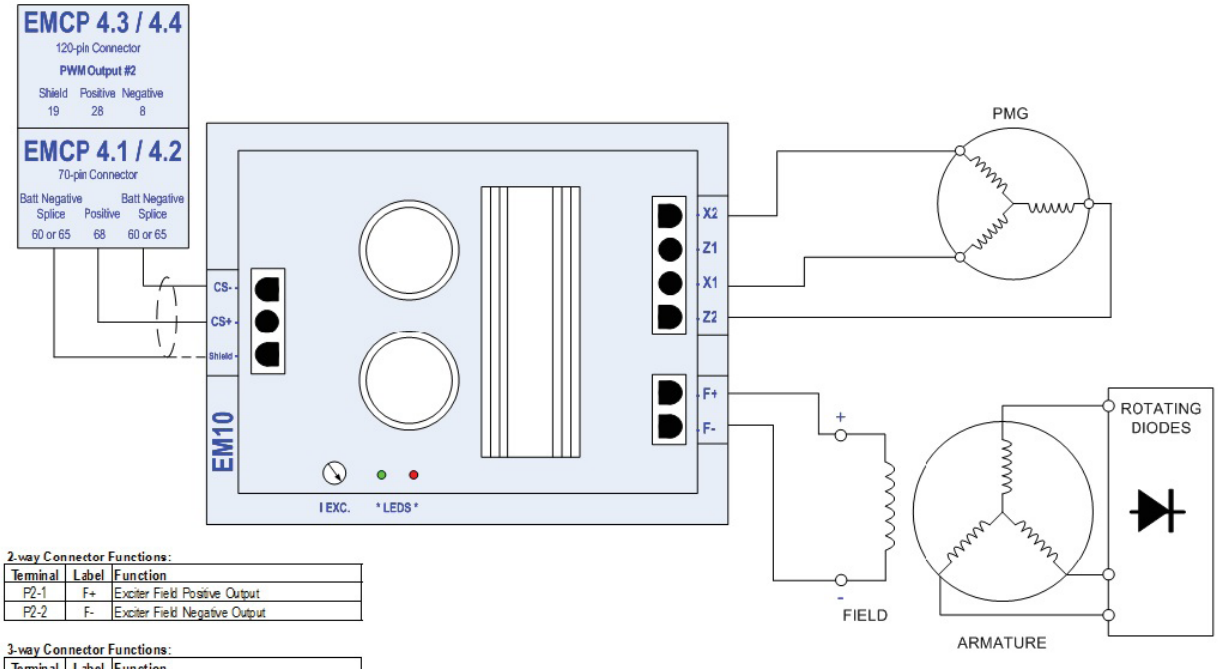
Excitation Module – EM10

Outline Drawing (Dimensions in mm)



Excitation Module – EM10

Example Connection Diagram (Permanent Magnet Excitation)



2-way Connector Functions:

Terminal	Label	Function
P2-1	F+	Exciter Field Positive Output
P2-2	F-	Exciter Field Negative Output

3-way Connector Functions:

Terminal	Label	Function
P3-1	Shield	Excitation Command Shield
P3-2	CS+	Excitation Command Positive Input
P3-3	CS-	Excitation Command Negative Input

4-way Connector Functions (PMG Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (PMG Phase B)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (PMG Phase A)
P4-4	Z2	Excitation Power Supply Input (PMG Phase C)

4-way Connector Functions (Self-Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (single-phase)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (single-phase)
P4-4	Z2	Not Connected

4-way Connector Functions (Internal Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (Aux Winding 1 - Positive)
P4-2	Z1	Excitation Power Supply Input (Aux Winding 2 - Positive)
P4-3	X1	Excitation Power Supply Input (Aux Winding 1 - Negative)
P4-4	Z2	Excitation Power Supply Input (Aux Winding 2 - Negative)

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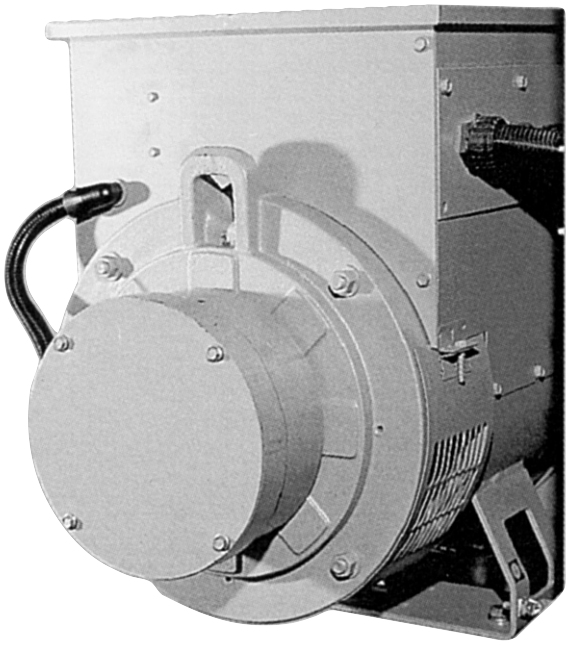
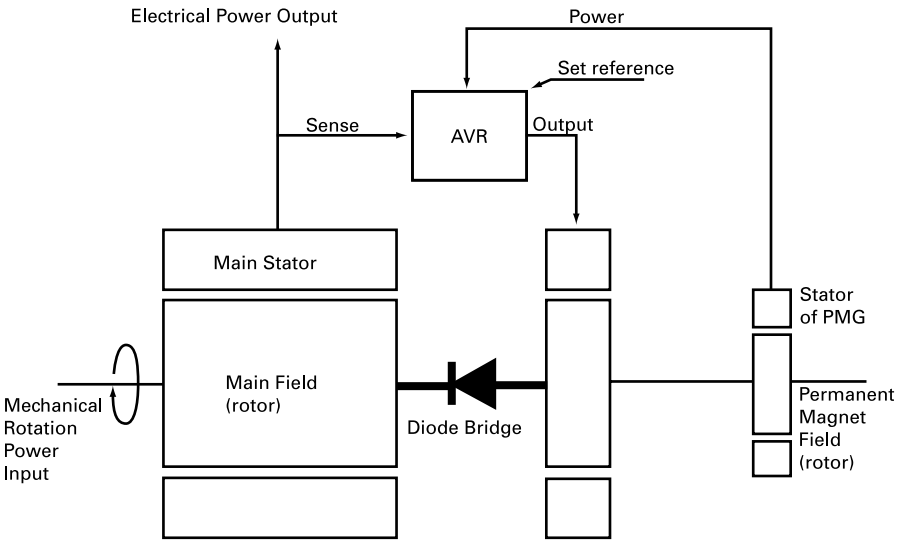


AVR12 – PERMANENT MAGNET GENERATOR

The permanent magnet generator (PMG) option upgrades the excitation system of the generator from the standard self-excited system to a separately-excited system. The PMG couples to the non-drive end of the generator and provides an independent source of excitation power that ensures initial voltage build-up. The PMG improves the voltage response of the generator during transient load application, such as motor starting, and provides a sustained short-circuit current for the operation of protective devices. Isolation of the excitation power ensures that regulation is not affected by non-linear distorting loads.



BLOCK DIAGRAM OF PMG

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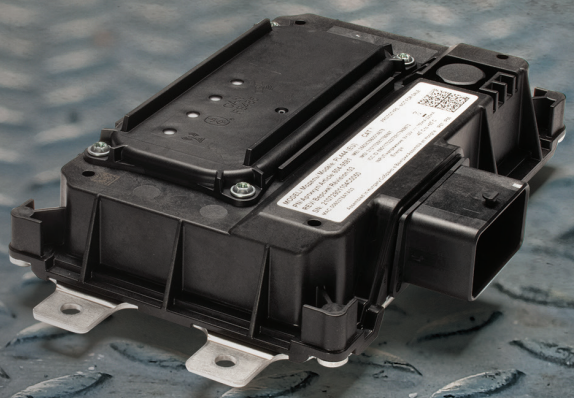
CAT® PRODUCT LINK™ TECHNOLOGY



PRODUCT LINK™

Cat® Product Link™ PL444

The PL444 is designed as a reliable, low-cost, engine agnostic telematics solution which is easy to install. The device comes pre-configured with a standard set of parameters including hours and location which report each day and enables immediate alerting of fault codes. Server side geofencing is also available so you can be confident your asset is in the right place. The PL444 will be used by multiple industries and functionality varies by industry.

Data Available Includes:

- [+] Status of Asset
- [+] Events and Alarms
- [+] Electrical Parameters
- [+] Engine Parameters
- [+] Location
- [+] Fuel Consumption & Fuel Level

[+] DATA PRIVACY

Caterpillar's commitment to Data Privacy is reflected in the following statements. Visit Cat.com to view Caterpillar's "Data Principles" and "Data Governance" statements.

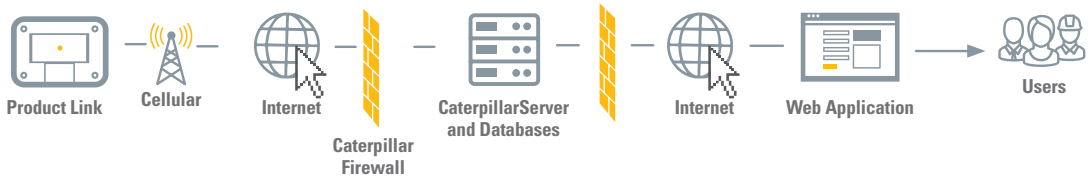
- [+] We are transparent about the collection and use of your data.
- [+] We protect your data.
- [+] We use your data to create value and improve products for our customers.

HIGH-LEVEL SECURITY OVERVIEW

Product Link's end-to-end system is designed with multi-layer security controls and safeguards to protect against unauthorized access and disclosure. High-level security safeguards include, but are not limited to:

- [+] Cryptographically secured to protect against unauthorized Product Link device software changes
- [+] Encrypted and authenticated remote connection
- [+] Caterpillar IT infrastructure secured utilizing generally accepted information security principles and practices
- [+] Only outbound remote connection, initiated by the Product Link device, is allowed. Device does not participate in or respond to general Internet traffic
- [+] Secure Caterpillar Equipment Management web application connection with user login authentication and role-based access controls

END-TO-END ARCHITECTURE



PL444 4G LTE RADIO TECHNICAL SPECIFICATIONS

HOW IT WORKS

The PL444 integrates a positioning receiver with a 4G LTE cellular communication system that will fall back to 3G or 2G signal if necessary to establish a connection. The PL444 will transfer hours, location and other asset data to Caterpillar to be viewed and analyzed through Caterpillar equipment management software.

INPUT VOLTAGE

Voltage Range	[+] 9.0V to 32.0V DC
Protection	[+] Reverse polarity

CURRENT CONSUMPTION (TYPICAL)

Sleep Current	[+] <3 mA
Idle Current (non-transmitting)	[+] <300 mA
Peak Current	[+] < 6A

PHYSICAL SPECIFICATIONS

Enclosure Material	[+] Plastic Cover (PBT+ASA GF30 FR) Aluminum Backplate (AlMg2.5 / H22; H23)
Dimensions (mm)	[+] 215.5 x 141.2 x 37.5
Weight	[+] 0.45 kg
Interface Connectors	[+] 48 pin Molex
LEDs	[+] Orange (GNSS), Yellow (Cellular), Blue (Data link), White (Bluetooth*)

ENVIRONMENT

Operating Temperature	[+] -40°C to +85°C
Storage Temperature	[+] -40°C to +95°C
Ingress Protection	[+] IP66/67 (MATING CONNECTOR MUST BE INSTALLED)
Humidity	[+] SAE J1455
Vibration	[+] 9.8 Grms random (24-2000 Hz), up to 0.5 g^2/Hz

COMMUNICATIONS

Datalink	[+] J1939/CAN
Datalink	[+] Modbus (RS-485)
Wireless	[+] 4G LTE with 2G/3G fallback
Wireless	[+] Bluetooth®*/BLE 5.0

INPUTS / OUTPUTS

Low Side Drivers (300 mA max)	[+] 2
Switch to Ground	[+] 1
Keyswitch	[+] 1

Note: In the case of an extended outage, the capacity of the message queue can be exceeded and some data will be lost as older messages are overwritten.

POSITIONING (GNSS)

Signal Tracking	[+] GPS/Galileo/GLONASS/BeiDou
Accuracy	[+] <6 m (95%)
Antenna	[+] Internal

BLUETOOTH* LOW ENERGY

Version:	[+] BLE 5.0
Band:	[+] 2.4 GHZ (2.42-2.48 GHz)
Antenna:	[+] Internal

REGULATORY COMPLIANCE: PL444 (NA)

FCC, IC, UL/CSA 62368-1, RED, RoHS, WEEE, REACH

REGULATORY COMPLIANCE: PL444 (EU)

RCM, EAC, EN 62368-1, CE RED, RoHS, WEEE, REACH

CELLULAR COMMUNCATIONS

CELLULAR COMMUNICATIONS PL444 (NA): 604-9580

4G LTE Cat 4	[+] + 2, 4, 5, 7, 12/17, 13
3G	[+] +2, 4, 5
2G	[+] +2, 5
Operating Temperature	[+] -30°C to +70°C
Antenna	[+] 2x Internal (Primary + Diversity) to support 2x2 MIMO
SIM	[+] eUICC chip

CELLULAR COMMUNICATIONS PL444 (EU): 604-9581

4G LTE Cat 4	[+] + 1, 3, 7, 8, 20, 28A
3G	[+] +1, 3, 8
2G	[+] +3, 8
Operating Temperature	[+] -30°C to +70°C
Antenna	[+] 2x Internal (Primary + Diversity) to support 2x2 MIMO
SIM	[+] eUICC chip

*Bluetooth is a future capability.

LET'S DO THE WORK.™

LEHE20818-00

Circuit Breakers

Picture shown may not reflect actual configuration

Molded Case Circuit Breakers:
100A - 3000A
200 kW - 750 kW Gensets

Features

- 100% UL Listing
- Electronic Trip Units
- Double insulation
- Clear indication of breaker status
- Can be used in normal operation in an ambient of –25°and+70° C
- Auxiliary contacts available
- Insulating case constructed from fiberglass reinforced synthetic resin
- Anti-corrosion treatment on all metal parts
- Optional 2 or 3 Circuit Breakers

Conformity with International Standards

Circuit Breakers have been designed to comply with these major standards:

- UL 489
- CSA22.2 No.5
- IEC 60947-2
- NEMA AB1

Circuit Breakers

Manually Operated Circuit Breakers for 40 – 200 ekW Diesel Generator Sets

Current (A)	Frame	Number of poles	Interupting Ratings (kA rms)			Trip Unit	(#)Lugs Size	Aux options
			240V	480V	600V			
60	H	3	65	35	18	LSI	(1) 14-2/0 AWG	FORM C (1 NC & 1 NO) SHUNT TRIP (12V)
100	H	3	65	35	18			
150	H	3	65	35	18			
250*	J	3	65	35	18		(1) 1/0-300 kcmil	
400	T5N	3	65	25	18		(2) 3/0-250 kcmil	1 Form C + 1 Bell Alarm Shunt Trip (12V)
600	T6N	3	65	35	20	LSI	(3) 2/0 -400 kcmil	
800	T6N	3	65	35	20			

* Also offered as 225A Option on LC Models
(#) No of Cables per Lug

Diesel 40-60ekW
C4.4LC

First Breaker	Second Breaker
Circuit Breaker (A)	Circuit Breaker (A)
60	60
100	100
150	150
225	250
250	
400	

Available Breaker Configurations	
First Breaker	Second Breaker
H	–
H	H
H	J
J	–
J	J
J	H
T5	–

Diesel 80-200ekW
C4.4PG, **C7.1PG**

First Breaker	Second Breaker
Circuit Breaker (A)	Circuit Breaker (A)
60	60
100	100
150	150
250	250
400	
600	
800	

Available Breaker Configurations		
First Breaker	Second Breaker	
H	H	J
J	H	J
T5	H	J
T6	H	J

Full Load Current

Full Load Current Table for the Circuit Breakers

Three Phase – 60 Hz

Power		Voltage				
kW	KVA	600 V	480 V	240 V	220 V	208 V
		FLC	FLC	FLC	FLC	FLC
40.0	50.0	48.1	60.1	120.3	131.2	138.8
50.0	62.5	60.1	75.2	150.4	164.0	173.5
60.0	75.0	72.2	90.2	180.4	196.8	208.2
80.0	100.0	96.2	120.3	240.6	262.4	277.6
100.0	125.0	120.3	150.4	300.7	328.0	347.0
125.0	156.3	150.4	187.9	375.9	410.1	433.7
150.0	187.5	180.4	225.5	451.1	492.1	520.5
175.0	218.8	210.5	263.1	526.2	574.1	607.2
200.0	250.0	240.6	300.7	601.4	656.1	694.0
250.0	312.5	300.7	375.9	751.8	820.1	867.4
300.0	375.0	360.9	451.1	902.1	984.1	1040.9
350.0	437.5	421.0	526.2	1052.5	1148.2	1214.4
400.0	500.0	481.1	601.4	1202.8	1312.2	1387.9
500.0	625.0	601.4	751.8	1503.6	1640.2	1734.9
550.0	687.5	661.6	827.0	1653.9	1804.3	1908.4
600.0	750.0	721.7	902.1	1804.3	1968.3	2081.9
635.0	793.8	763.8	954.8	1909.5	2083.1	2203.3
650.0	812.5	781.9	977.3	1954.6	2132.3	2255.3
680.0	850.0	817.9	1022.4	2044.8	2230.7	2359.4
700.0	875.0	842.0	1052.5	2105.0	2296.3	2428.8
750.0	937.5	902.1	1127.7	2255.3	2460.4	2602.3

Single Phase – 60 Hz

Power		Voltage
kW	KVA	240 V
		FLC
40.0	50.0	166.67
50.0	50.0	208.33
57.0	57.0	237.50
60.0	60.0	250.00
80.0	80.0	333.33
100.0	100.0	416.67

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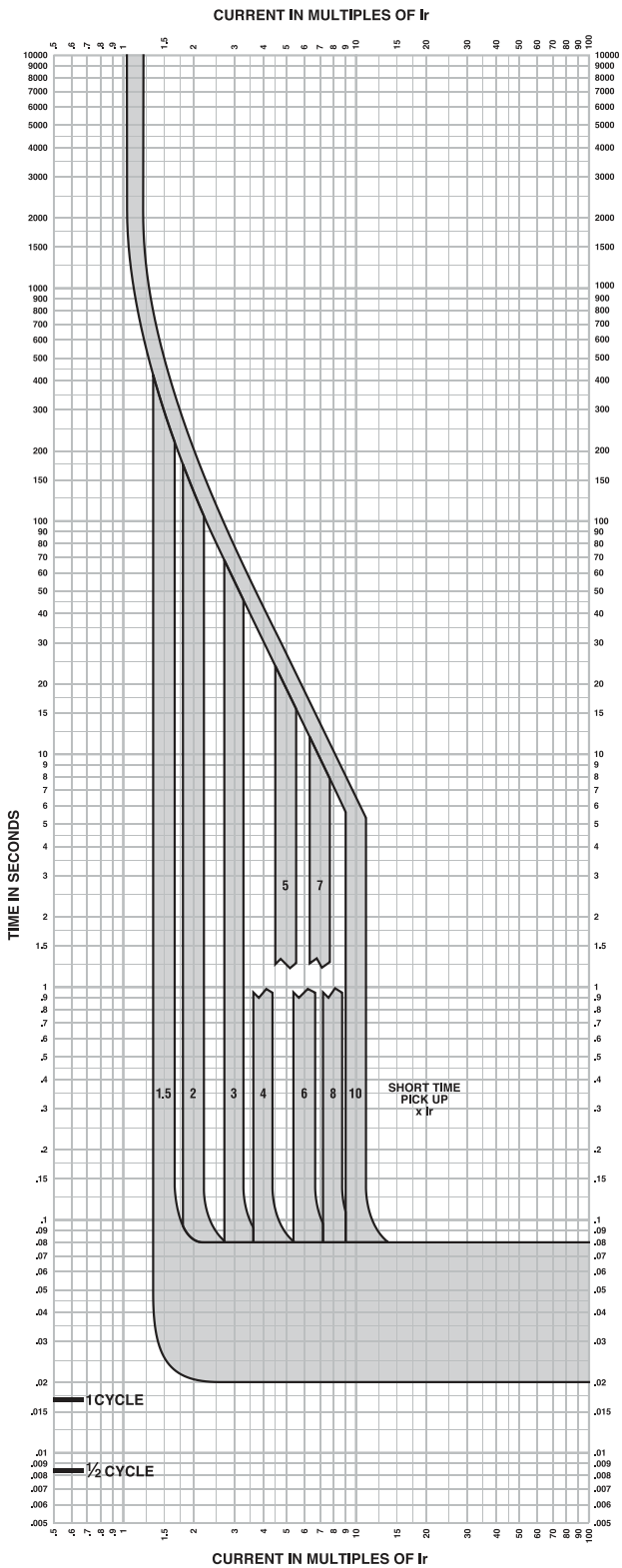
H-Frame Circuit Breakers

Electronic Trip Unit Long Time / Short Time Trip Curve



Long Time/Short Time Trip Curve
60A, 100A, 150A H-Frame

The time-current curve information is to be used for application and coordination purposes only.

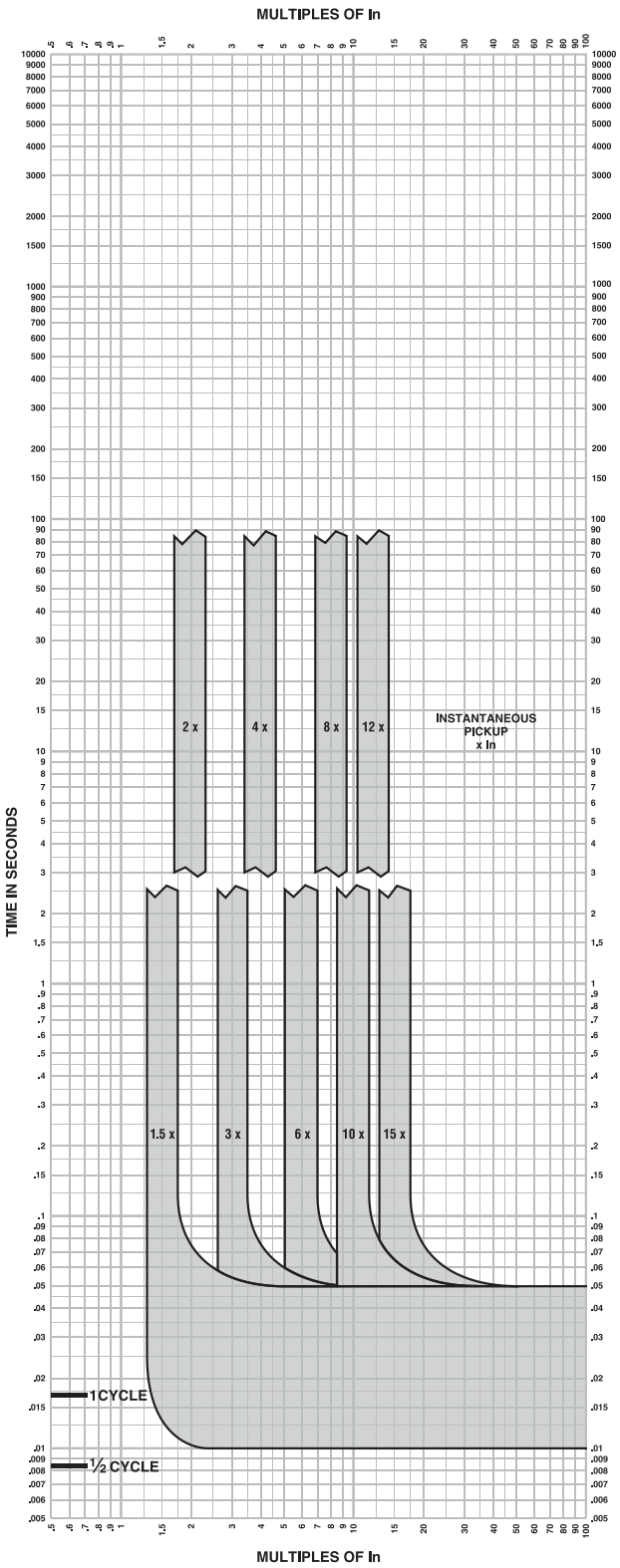
Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.

H-Frame Circuit Breakers

Electronic Trip Unit Instantaneous Trip Curve



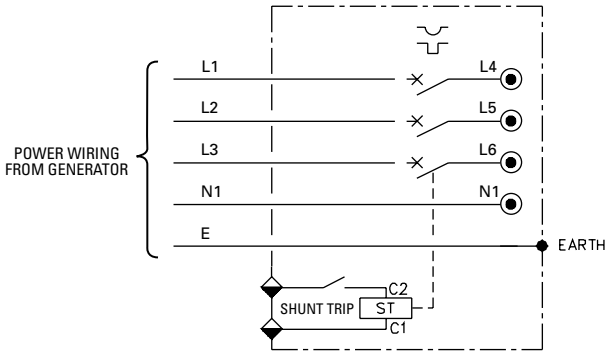
Instantaneous Trip Curve
60A, 100A, 150A H-Frame

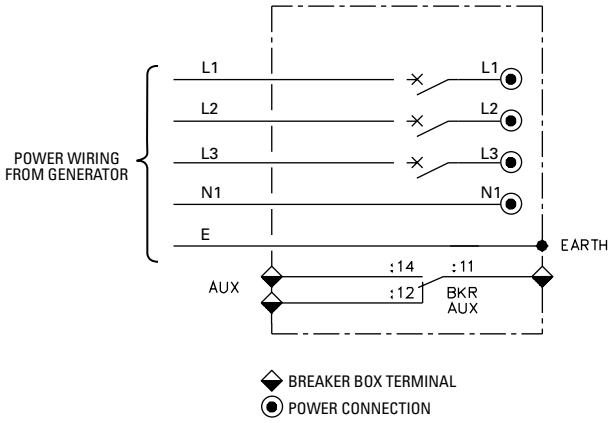
The time-current curve information is to be used for application and coordination purposes only.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. In = Maximum dial setting of Ir.
   60A H-Frame: In = 60A = Max Ir setting
   100A H-Frame: In = 100A = Max Ir setting
   150A H-Frame: In = 150A = Max Ir setting

Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.





AUX – AUXILIARY CONTACTS SHT2 – 12/24 V SHUNT TRIP

Option SHT2 adds a DC operated shunt trip which can be used to automatically open the circuit breaker upon activation of a generator set shut down signal from the generator set control panel, or from a remote signal (supplied by others).

Option AUX adds an auxiliary changeover switch which can be used for remote indication of the circuit breaker status.

Market: N. America

LEHE4009 (01-05)

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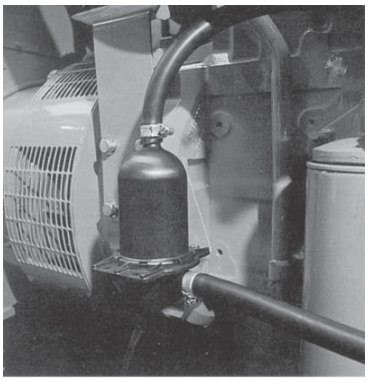


Picture shown may not represent actual package.

Coolant Heater

(WHH / WHHH / WHHA / JWH0089)

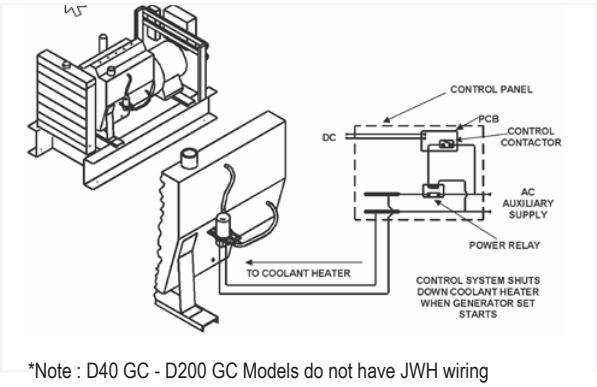
Appropriate when the generator set is to be sited in a low ambient environment, the heater maintains the engine coolant at a temperature [typically 38°C (100°F)] which facilitates rapid starting and load acceptance. The heater assembly uses UL compliant components (to UL1030) and has CSA certification which is to both CSA and UL Standards.

The heater itself is powered either by a 110/120 volt (VAC 120) for 60 Hz or 240V (VAC 240) for 50 Hz AC auxiliary supply protected by a safeguard breaker inside the main control panel. A thermostatic controller is included to regulate the output temperature to within safe limits. When the generator set is not running the heater is automatically connected to the AC supply through a power relay mounted in the control panel.

Upon receiving a start signal the AC supply is automatically disconnected by the power relay and automatically reconnected when the start signal is removed and the engine has stopped*.

Features

- Molded from Polyphenylene Sulphide
- Rust free, corrosion resistant with exceptional tensile strength
- Vibration and shock tested to extreme limits to ensure durability
- Compatible with all coolant additives
- Incoloy element for longer service life



*Note : D40 GC - D200 GC Models do not have JWH wiring connection with the control panel and the JWH wiring connection is up to the customers..

VAC 120

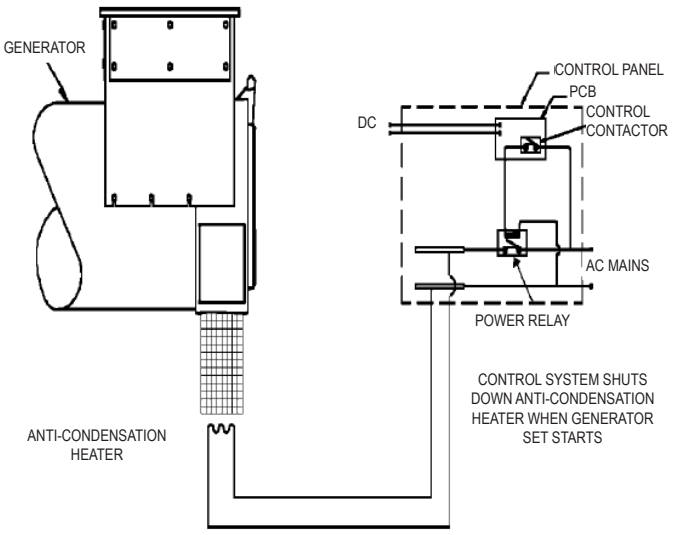
Diesel Generator Set Engine Models	Nominal Coolant Heater Power Consumption (Watts)
C2.2, C4.4*, C7.1*	1000
C3.3, C4.4	1500
C7.1	1800

Gas Generator Set Models	Nominal Coolant Heater Power Consumption (Watts)
DG30-2, DG50-2, DG60-2, DG80-2	1000
DG100-2, DG125-2, DG150-2	1800

VAC 240

Diesel Generator Set Engine Models	Feature Code
C3.3, C4.4, C7.1	1500
C13, C15, C18	3000

* For North American Region



Generator Anti-condensation Heater AH1H

Appropriate when the generator set is to be sited in a low ambient and/or high humidity environment, the heater maintains the AC generator at a suitable temperature to prevent winding corrosion due to condensation.

The heater itself is powered by a 110/120 volt (VAC 120) or 208/240 volt (VAC 240) AC auxiliary supply protected by a fuse inside the main control panel. When the generator set is not running the heater is automatically connected to the AC supply through a power relay mounted in the control panel. Upon receiving a start signal the AC supply is automatically disconnected by the power relay and automatically reconnected when the start signal is removed and the engine has stopped.

Generator Frame	Nominal Heater Power Consumption (Watts)
LC15XX, M17XX	60
LC31XX, M22XX	100
LC50XX, M27XX	250

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Picture shown may not represent actual package

Weather Protective and Sound Attenuated Enclosures

D40-2LC to D60-4LC

Features

Highly Corrosion Resistant construction

- Stainless steel flush fitting latches and hinges tested and proven to withstand extreme conditions of corrosion
- Zinc plated or stainless steel fasteners
- Body constructed from 16 gauge steel components treated with polyester powder coating

Excellent Access

- Single side access for service and controls
- Over head door with lift assist strut on service side
- All non-service sides have removable doors and/or panels
- Radiator fill access
- Lube oil and coolant drains piped to the exterior of the enclosure base
- Large cable entry area for installation ease

Transportability

- These enclosures are of extremely rugged construction to withstand outdoor exposure and rough handling common on many construction sites.
- This range of enclosures are designed on modular principles which will aid on site repair

Security and Safety

- Lockable access doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Fuel fill, oil fill, and battery can only be reached via lockable access
- Stub-up area is rodent proof
- Externally mounted emergency stop button

Options

- Weather Protective Enclosure
- Sound Attenuated Enclosure – Weather protective with critical silencer
- Cat Yellow or white paint
- UL Listed fuel tanks

Enclosure Sound Pressure Levels (SPL) at 100%

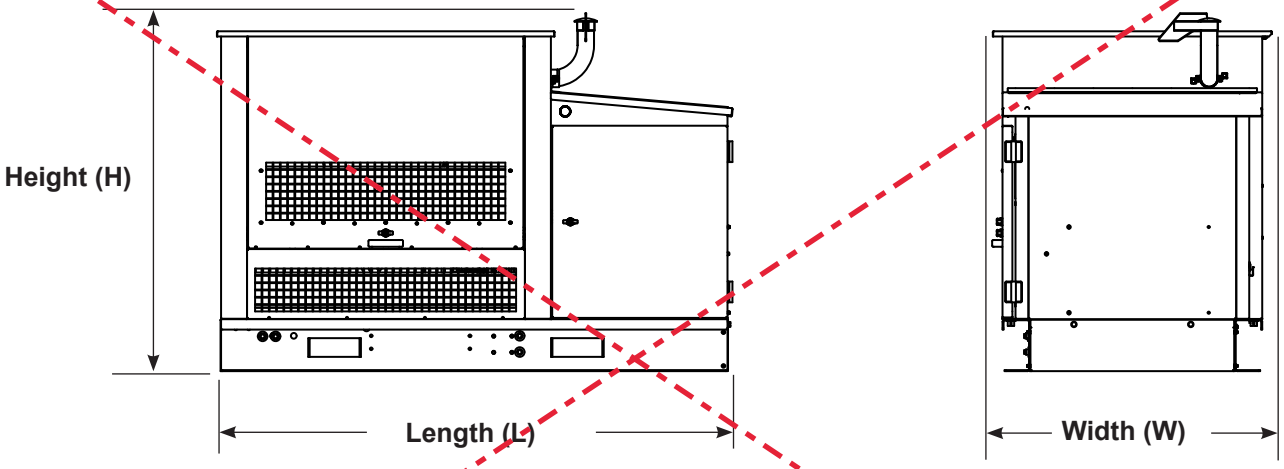
Sound Attenuated Enclosure		Cooling Air Flow Rate		SPL @ 7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D40-2LC	40	1.7	3602	74
D50-2LC	50	1.7	3602	74
D60-4LC	60	1.9	4026	74

Weather Protective Enclosure		Cooling Air Flow Rate		SPL @ 7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D40-2LC	40	1.7	3602	85
D50-2LC	50	1.7	3602	86
D60-4LC	60	1.9	4026	88

Component Weights to Calculate Package Weight

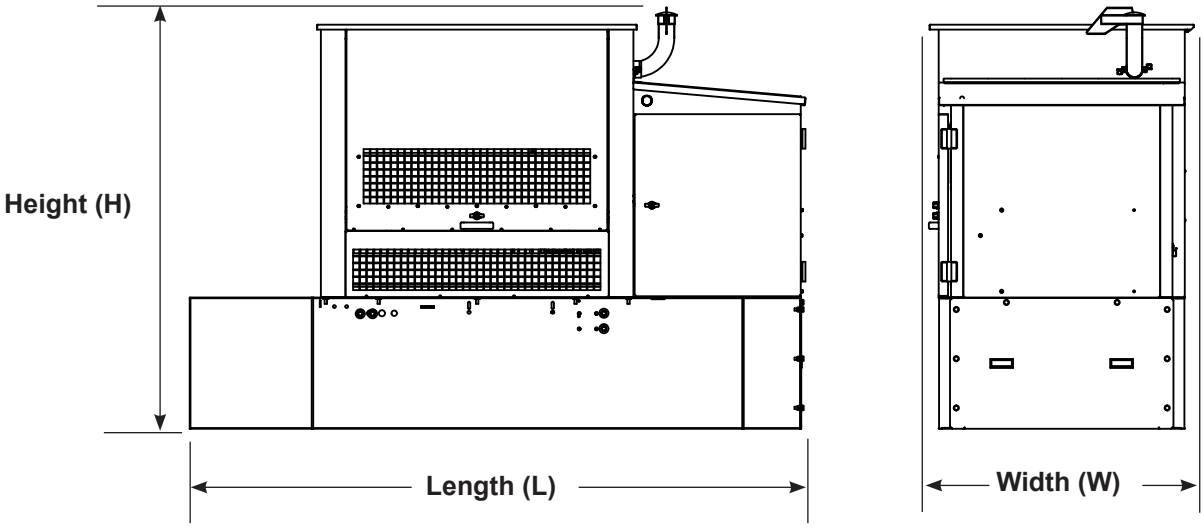
Model	Standby eKW	Skid Base		Weather Protective Enclosure		Sound Attenuated Enclosure	
		kg	lb	kg	lb	kg	lb
D40-2LC	40	80	176	121	267	137	302
D50-2LC	50						
D60-4LC	60						

Enclosure Dimensions on Skid Bases



Engine Model	Generator Set Rating eKW	Enclosure	Width 'W'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in
C4.4	40	Weather Protective/ Sound Attenuated	1075	42.3	1972	77.6	1378	54.3
	50							
	60							

Enclosure Dimensions on UL Listed Integral Tanks



Engine Model	Generator Set Rating ekW	Enclosure	137 Gallon Integral Tank				255 Gallon Integral Tank			
			Length 'L'		Height 'H'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in	mm	in
C4.4	40	Weather Protective/ Sound Attenuated	2503	98.5	1712	67.4 5'-7.4"	2503	98.5	2041	80.4
	50									
	60									

Image shown may not reflect actual configuration

C4.4 LC Integral/Sub-base Fuel Tanks

Newberry
Diesel Generator Set
40-60 kW 60 Hz

Features

- UL Listed for United States (UL 142) and Canada (CAN/ULC S601)
- Facilitate compliance with NFPA 30 code, NFPA 37 and 110 standards and CSA C282 code and B139-09 standard
- Welded, heavy steel gauge construction with a containment basin sized as a minimum 110% of the tank
- Gloss black polyester triglycidyl isocyanurate (TGIC) powder coating
- Dedicated external customer interface area with access to the 4" (101.6 mm) fuel fill, visual level gauge, normal and emergency vents
- Rear electrical stub-up area with removable access panel
- Removable engine supply and return dip tubes
- Two additional 1" (25.4 mm) ports for customer use
- Tanks are rated to safely support the weight of the generator
- Standard NPT tank fittings
- UL listed emergency vents sized as per UL standards 3" (76.2 mm) NPT
- Normal atmospheric vent 1-1/4" (31.75 mm)
- Top-mounted fuel level sensor with control panel alarms
- Top-mounted leak detection switch
- Lockable fuel fill cap, 4" (101.6 mm) NPT

Description

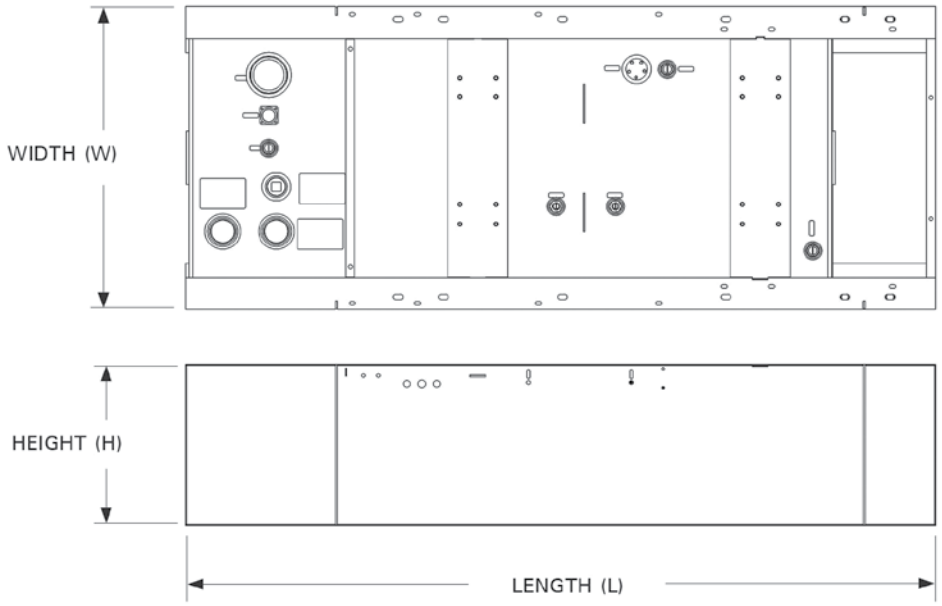
- Dual wall, secondary containment
- Pressure tested to UL requirements
- Fuel tank mounts directly below generator skid base
- Sub-base fuel tank mounts directly below generator skid base
- Integral fuel tank is incorporated into the generator set base frame including linear vibration isolators between tank base, engine, and generator
- Modular tank design is compatible with all factory units open and enclosed

Options

- Emergency vent and normal vent extension kits 12' (3.66 m)
- 5 gal (18.9 L) spill containment
- Overfill prevention valve
- Tank riser to allow for visual secondary containment leak inspection
- Drop tube

C4.4 LC Sub-base Fuel Tank Dimensions and Capacities

Engine Model	Tank Feature Code	Generator Set Rating ekW	Est. Run Time hrs	Fillable Capacity		Usable Capacity		Vent	Length 'L'		Width 'W'		Height 'H'		Weight (Dry)	
				L	gal	L	gal	in	mm	in	mm	in	mm	in	kg	lb
C4.4	INTFT140 SBT140	40	36	520	137	508	134	3	2483	97.8	1000	39.4	533	21.0	336	740
		50	29													
		60	26													
	INTFT250 SBT250	40	68	965	255	952	251	3					864	34.0	466	1027
		50	55													
		60	49													



Note: For reference only – do not use for installation design. Please contact your local dealer for exact dimensions.

Tanks are UL Listed and constructed in accordance with UL Standard for Safety UL 142, Steel Aboveground Tanks for Flammable and Combustible Liquids and Canada CAN/ULC S601, Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids.

Fuel tanks facilitate compliance with the following United States NFPA Code and Standards:
- NFPA 30: Flammable and Combustible Liquids Code
- NFPA 37: Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
- NFPA 110: Standard for Emergency and Standby Power Systems

Fuel tanks facilitate compliance with the following Canadian Standard and Code:
- CSA C282 – Emergency Electrical Power Supply for Buildings
- CSA B139-09 – Installation Code for Oil-Burning Equipment

FUEL LEVEL ALARMS - FSS

CRITICAL LOW FUEL LEVEL SHUTDOWN AND LOW FUEL LEVEL ALARM

These options provide an alarm on low fuel level and a shutdown on critical low fuel level. This warning is reported by an indicator light on the control panel with an audible alarm also available as an option. This warning can additionally be relayed to a remote annunciator.

Note: Standard Fuel Fill, UL Rated Emergency-vent, Standard vent, Fuel Sender & Leak Detection Probe are included as standard on generator sets fitted with UL Listed fuel tanks.

CRITICAL HIGH FUEL LEVEL ALARM

This option provides an alarm on critical high fuel level. This warning is reported by an indicator light on the control panel with an audible alarm also available as an option. This warning can additionally be relayed to a remote annunciator.

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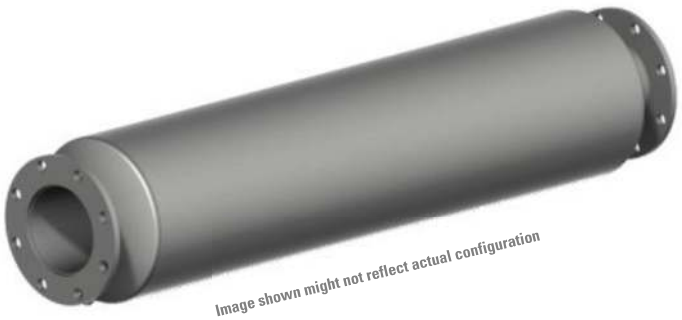
Silencers

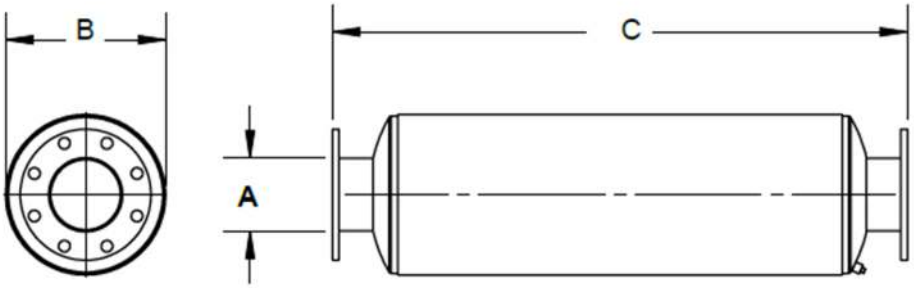


10/20/25/35 dBA

Silencers for C3.3 & C4.4

STANDARD FEATURES

- End Inlet / End Outlet can be adapted to different exhaust configurations for ease of installation
- Coated with satin black paint rated to 650°C to retain appearance and corrosion resistance over time
- Connection ANSI flanges are readily adaptable to other hardware providing ease of installation
- Complete with condensate drain and plug
- Mild steel all welded construction for heavy duty application and corrosion resistance



Industrial Silencer – 10dBA

Generator Model	Frequency	Sound Attenuation @ 100% Load	Dimensions			Weight
	Hz	dBA	Length (C) mm	Width (B) mm	Inlet Diameter (A) mm	Kg
C4.4	60	10	830	203	76	6.3

Industrial Silencer – 20dBA

Generator Model	Frequency	Sound Attenuation @ 100% Load	Dimensions			Weight
	Hz	dBA	Length (C) mm	Width (B) mm	Inlet Diameter (A) mm	Kg
C3.3	50 / 60	20	770	158	51	6
	50 / 60	20	830	203	76	6.3
C4.4	50 / 60	20	830	203	76	6.3

Silencers

Residential Silencer – 25dBA

Generator Model	Frequency	Sound Attenuation @ 100% Load	Dimensions			Weight
	Hz	dBA	Length (C) mm	Width (B) mm	Inlet Diameter (A) mm	Kg
C3.3	50 / 60	25	1176	240	51	17.5
C4.4	50 / 60	25	1353	279	76.2	17.1

Critical Silencer – 35dBA

Generator Model	Frequency	Sound Attenuation @ 100% Load	Dimensions			Weight
	Hz	dBA	Length (C) mm	Width (B) mm	Inlet Diameter (A) mm	Kg
C4.4	60	35	2183	279	76	23.5

BUILT FOR IT.™

AIR CLEANERS

Image shown might not reflect actual configuration

AIR CLEANERS FOR C4.4 ENGINES

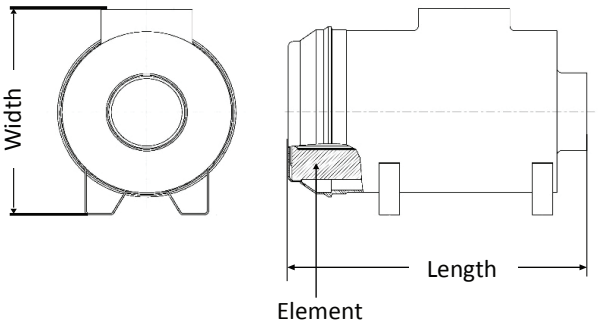
GENERAL DESCRIPTION

Air cleaners reduce contaminants flowing into the air intake system, provide a high level of engine protection from harmful contaminants and increase engine performance and fuel efficiency.

FEATURES

Single element cleaner

- Element
  - Radial Seal & Pleatloc technology
  - No Safety Element
  - Standard Yellow Media
  - Unique fit filters with a proprietary design
  - More filter media in a smaller area
- Housing
  - Metal Body
- Service indicator
  - 1/8-27 NPT



SPECIFICATION

Single element cleaner

	Element
Flow rate (m^3/min)	6.5 - 8.0
Overall Efficiency	99.9 %
Effective filtering Area (m^2)	3.14 - 4.32
Number of convolutions	165-201
Depth of convolutions	28.5
Applicable Feature Codes	ACLSS01

CLEANER DIMENSIONS

- Length – 493 mm
- Width – 265 mm
- Weight – 4 Kg

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9461 – Battery Charger

The 9461 series of metal enclosed intelligent battery chargers have been developed with safety, usability, optimised battery performance and maximum battery lifetimes in mind.

A comprehensive range of input and output protections ensures a continued safe charging environment also enabling the use of the charger as a power supply.

Features

- Intelligent two, three and four stage charging profiles
- Configurable to suit most battery types (12V/24V)
- Adjustable current limit
- Can be used as a battery charger, power supply or both at the same time
- Automatic or Manual boost and storage charge functions to help maintain battery condition
- Digital Microprocessor Technology
- Temperature compensation for battery charging
- Low Output Ripple and superb line regulation
- Available in two variants (LCD display or LCD display & analogue meters) Full Protection
- AC input Under voltage
- AC input Over voltage
- Battery charger output Over voltage
- Battery charger output Over current
- Battery temperature compensation with over temperature protection
- Output short circuit and Inversion polarity with auto recovery
- Automatic power de-rating at high ambient temperatures
- Battery charger failure indication

Automatic Boost Mode

- Boosts and equalises cell charge improving battery performance and life

Power Save Mode

- Once the battery is fully charged the chargers switch to Eco-Power to save energy

Communication

- Can be integrated into external systems through:
  - Fully configurable via PC Software
  - External remote LCD option

Attachments

Benefits

- Fully flexible to maximise the life of the battery
- Suitable for a wide range of battery types
- Switched mode design
- Fault output
- Minimum 86% efficiency throughout full operating range
- No external intervention for boost mode
- Multiple chargers can be linked together to provide larger current output
- Can be permanently connected to battery and mains (utility) supply. No need to disconnect through high load conditions.

Specification

AC Supply Voltage Range 90V to 305V (L-N)	Frequency Range 48 Hz to 64 Hz (L-N)
DC Output Rating	10 A DC at 12 V & 24 V DC
Ripple and Noise	<1%
Efficiency	>86%
Auxiliary Output	100 mA DC at 12V
Regulation Line	<0.5%
Load	2%
Temperature Sensor Input	PT1000
Protections	Short Circuit DC Over Voltage DC Over Current Reverse Polarity Over Temperature AC Under & Over Voltage Battery Charger Failure
Charge Failure Relay	3 A at 30 V DC Volt Free Relay
Dimensions Overall	165 mm x 305 mm x 110 mm (6.5 in x 12 in x 4.3 in)
Weight	2.3 kg
Operating Temperature Range	-30 °C to +55 °C
Storage Temperature Range	-40 °C to +85 °C

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LEHE2076-00 (11/19)

Cat® Batteries

Cat Batteries – Greater Starting Power – Lower Maintenance – Longer Life

Cat Premium High Output (PHO) batteries are used in all Caterpillar Machines and Engine Gen-Sets. They are designed to meet stringent Caterpillar design specifications, which provide industry leading cold cranking amp (CCA) capability and maximum vibration resistance.

Maintenance Free or low maintenance designs are available in wet and dry configurations.

General Service Line batteries are available in Maintenance Free or low maintenance designs and in wet or dry configurations. Wide selections of BCI group sizes are available for automotive, light truck, bus, industrial, agricultural, marine, recreational and valve regulated (VRLA-AGM & Gel) applications.

Caterpillar. The difference counts.™

Cat Dealers define world – class product support. We offer you the right parts and service solutions, when and where you need them.

The Cat Dealer network of highly trained experts keeps your entire fleet up and running to maximize your equipment investments.

CATERPILLAR®

World's Toughest Batteries

Premium High Output – Maximum Vibration Resistance

- Vibration Resistance...five times the Industry Standard
- Exclusive "flat top" BCI group 4D & 8D batteries are Maintenance Free and have the industries highest cold cranking amps (CCA)
- Popular BCI group 31 Maintenance Free batteries with industry leading cold cranking amps...up to 1000 (CCA), for electric power, machine or on-highway truck and bus applications. Deep cycle models available for truck, marine or recreational usage

Specifications for Cat Premium High Output Batteries – Available Worldwide

								BCI Overall Dimensions				Nominal Weight	
BCI Group Size	Part No.	Cold Cranking Amps"	Reserve Capacity Minutes'	Volts	Amp Hr. Capacity @ 20 Hrs.	Construction	Add Water Maintenance Check Hours	Length In (mm)	Width In (mm)	Height In (mm)	Wet Lb (kg)	Dry Lb (kg)	Nominal Acid to Fill Qt (liter)
8D	153-5720	1500	465	12	210	C	MF	20.47 (520)	10.8 (275)	9.76 (248)	132 (60)	–	–
8D	101-4000	1400	400	12	190	LAC+	1000	20.7 (526.5)	10.96 (278)	9.76 (248)	132 (60)	86 (39)	18.0 (17.0)
4D	153-5710	1400	425	12	200	C	MF	20.47 (520)	8.58 (218)	9.76 (248)	119 (54)	–	–
4D	153-5700	1125	305	12	145	C	MF	20.47 (520)	8.58 (218)	9.76 (248)	101 (46)	–	–
4D	9X-9730	1300	400	12	190	LAC+	1000	20.75 (527)	8.58 (218)	9.76 (248)	119 (54)	81 (37)	14.8 (14.0)
4D	9X-9720	1000	275	12	140	LAC+	1000	20.75 (527)	8.58 (218)	9.76 (248)	101 (46)	59 (27)	15.9 (15.0)
31	175-4390	1000	180	12	90	C/S	MFA	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	175-4370	825	190	12	100	C/S**	MFA	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	175-4360	710	185	12	100	C/S***	MFA	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	250-0480	710	185	12	100	C/SDT***	MF	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	115-2422	1000	170	12	90	C SAE	MFA	12.9 (328.4)	6.74 (171.2)	9.46 (240.3)	60 (27)	–	–
31	115-2421	950	170	12	90	C SAE +	MFA	12.9 (328.4)	6.74 (171.2)	9.46 (240.3)	60 (27)	44 (20)	6.6 (6.2)
31	9X-3404	950	165	12	100	C SAE	MF	13 (330.2)	6.77 (172)	9.46 (240.3)	58 (26)	–	–
31	3T-5760	750	165	12	100	C SAE	MF	13 (330.2)	6.77 (172)	9.46 (240.3)	55 (25)	–	–
24	153-5656	650	110	12	52	SC	MF	10.98 (278.9)	6.85 (174)	9.0 (229.1)	39 (18)	–	–
65	230-6368	880	140	12	80	SC	MF	11.9 (303.4)	7.5 (190.8)	7.5 (191.4)	45.5 (21)	–	–
74	153-5660	650	110	12	52	SC*	MF	10.98 (278.9)	7.0 (178.2)	8.15 (206.9)	39 (18)	–	–
58	175-4280	500	70	12	35	SC	MF	9.96 (253.1)	7.2 (182.5)	6.9 (176)	31 (14)	–	–
2	153-5690	765	210	6	90	LAC+	1000	10.24 (260)	6.8 (173)	8.72 (221.6)	37 (17)	22 (10)	4.8 (4.5)

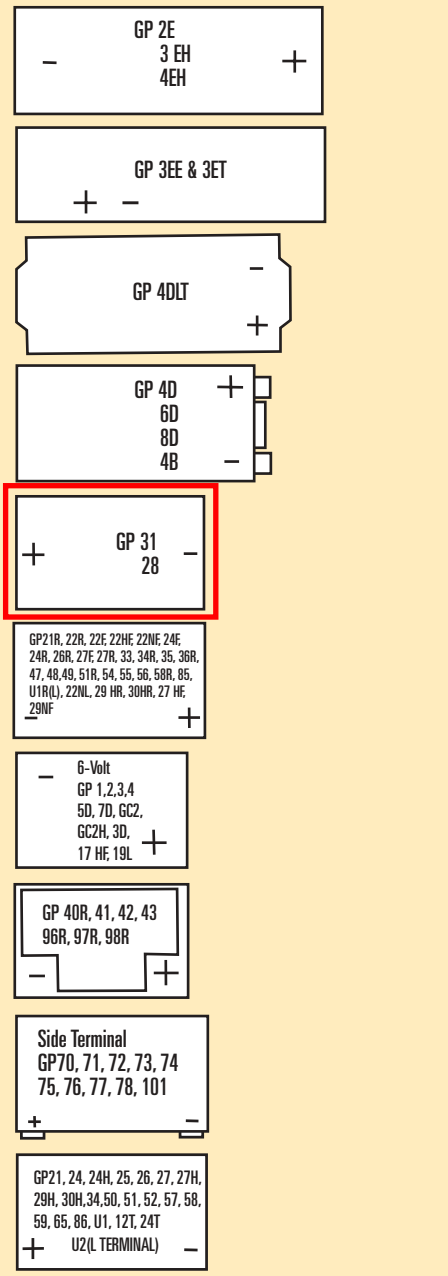
Construction Notes:
LAC = Low Maintenance, Hybrid Construction
C = Calcium Lead Alloy Grid Design
MF = Maintenance Free
MFA = Maintenance Free with Accessible Vent Caps
S = Stud Terminals
+ = Shipped Dry Only
* = Side Terminals
** = Starting and Deep Cycle Battery
*** = Deep Cycle and Starting Battery
" = For 30 seconds at 0° F (-18° C)
' = Minimum of 25 amp output at 80° F (27° C)
SAE = Uses SAE Posts
SDT = Dual, Top mounted Terminals, Stud and SAE Post, Marine Deep Cycle/Starting Battery
SC = Silver (Ag) Calcium Alloy Grids for resistance to high underhood temperatures

Rugged Design – Built Tough – Reliable Starting

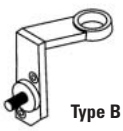
- Positive and Negative plates are anchored to container bottom and locked at the top of cell element for maximum vibration resistance.
- Heavy-duty forged terminal post bushings provide maximum strength and resistance to acid seepage.
- Hefty full-frame grids, no sharp edges, optimum acid/paste combination provides better charge acceptance after deep discharge.
- Manifold vented cover with built-in Flame Arrestor…a safety feature that directs corrosive gases away from the battery and hold-downs.
- Thick, robust container resists rugged treatment typical of heavy-duty commercial use. Embossed part number & descriptors for easy serviceability.

Battery Information

BCI Terminal Locations



Transit Bus Terminal for 8D Part # 250-0473
One piece end terminal.
Right end of Battery.
1/2" - 13 Steel Positive Stud
3/8" - 16 Steel Negative Stud



Type B

Cat Premium High Output Batteries – Built Tough to Exceed Demanding Performance Test Requirements:

100 hour Vibration Testing – Five Times the Industry Standard

- Battery must be able to withstand vibration forces without suffering mechanical damage, loss of capacity, loss of electrolyte or without developing internal/external leaks
- Battery must pass a high rate discharge test after the vibration testing

Five 72-hour Deep Discharge/Recharge Test Cycles

- Battery must recover to 25 charging amps within 20 minutes and meet Industry Electrical Performance Standards

30 Day Complete Discharge Test

- Battery must recover to 25 charging amps within 60 minutes and meet Industry Electrical Performance Standards after recharging

SAE J2185 Life Cycle Test

- Battery subject to deeper discharge and charge cycles at extreme temperatures not normally encountered in starting a machine or vehicle

Cold Soak Test

- Battery cold soaked at sub-freezing temperatures and then tested by starting an equally cold engine

Battery Accessories

Group 31 – Charging Posts for Stud Terminals – Part # 4C-5637
Screw-in Charging Posts for Side Terminals – Part # 4C-5638
Wing Nut – Part # 2B-9498 for Part #'s 175-4390/175-4370/175-4360/8C-3628
Wing Nut – Part # 3B-0723 for Part #'s 8C-3638 and 8C-3639
Digital Battery Analyzer – Part # 177-2330
Battery Voltmeter – Part # 4C-6600
Battery Load Tester – Part # 4C-4911
Booster Cable 12' (3.66 m) – Part # 4C-4933
Booster Cable 20' (6.00 m) – Part # 4C-4937
Heavy Duty Commercial Fast Charger (110V) – Part # 4C-4921
Heavy Duty Commercial Fast Charger (220V) – Part # 4C-4910
Extra Vent Caps (6) for Dry Batteries – Part # 7N-0060

Note: Ratings and Part Numbers are subject to change without notice.

Recycle all scrap batteries.
We accept lead-acid batteries for recycling.

Cat Batteries

World Wide Application Flexibility

Marine Commercial Vessels
Maintenance Free 4D, 8D and Group 31 Batteries. General Service Line Line valve regulated (VRLA) Gel batteries. High Marine Cranking Amps (MCA) and Deep Cycling capabilities.

Automotive-Truck-Bus & RV
A wide selection of popular BCI group sizes. Maintenance Free, Severe Service and Deep Cycle models. Application Specific Group 31 Truck Batteries.

Commercial & Recreational
A wide selection of premium batteries in most BCI group sizes for light commercial, recreational, agricultural and industrial applications.

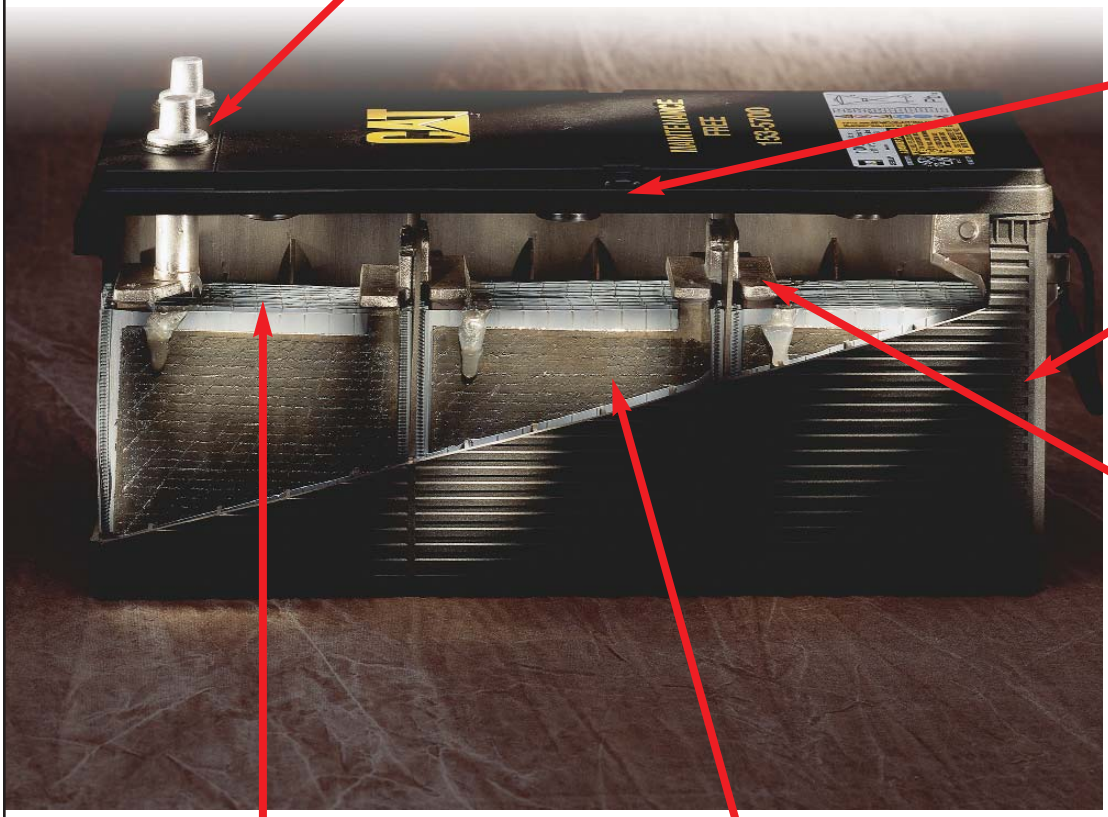
Marine Pleasure Craft
Premium High Output BCI Group 31, Dual Terminal Deep Cycle Batteries. General Service Line BCI group 24M, 27M and 8V sizes.

Electric Power Generation
Premium High Output Maintenance Free and Accessible batteries in BCI group 4D, 8D, & 31 sizes. High Cold Cranking Amp (CCA) Capability. General Service Line valve regulated (VRLA)
AGM batteries for UPS or stationary power applications.

Construction & Mining
Premium High Output Maintenance Free batteries. BCI group 4D, 8D and 31 Sizes. Industry leading cold cranking amps (CCA) and maximum vibration resistance.

Cat Batteries

Heavy-duty Forged Terminal Post Bushings



Built-in Flame Arrestor

Robust Reinforced Case

Vibration Resistant Plates & Elements

Heavy-duty Grids

Rugged Separators

Robust Components = Long Life + Reliable Starts

- Heavy-duty forged terminal post bushings provide maximum strength and resistance to acid seepage that causes corrosion and black posts. Thicker internal terminal posts provide lower electrical resistance and higher cold cranking amp output.
- Rugged microporous polyethylene envelope separators protect against “shorts” and vibration damage. Deep Cycle batteries utilize double insulated Glass mat separators for longer cycling life.
- Maintenance Free batteries utilize calcium lead alloy on both positive and negative plates that reduces gassing and water consumption. Automotive batteries have Silver (Ag) Calcium Alloy Grids for resistance to high underhood temperatures.
- Heavy-duty, full frame battery grids with no sharp edges. An optimum acid/paste combination provides better charge acceptance after a deep discharge.
- Positive and Negative plates are anchored to the container bottom and the cell element is locked at the top for maximum vibration resistance. Straps are thicker, heavier and cast (not welded) into the plates.
- Manifold vented cover with built-in Flame Arrestor…a safety feature that directs corrosive gases away from the battery and hold-downs.
- Robust reinforced case provides extra strength in all temperature extremes. Brickwork design on sides reduces chance of punctures and case flexing. Embossed part number and descriptors for easy serviceability.

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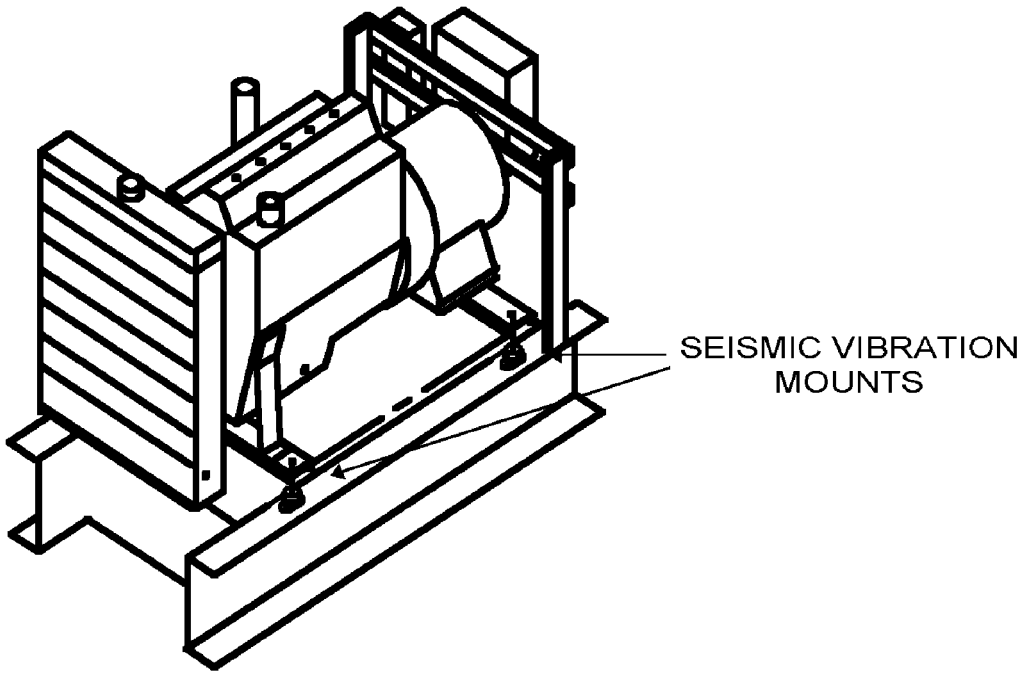
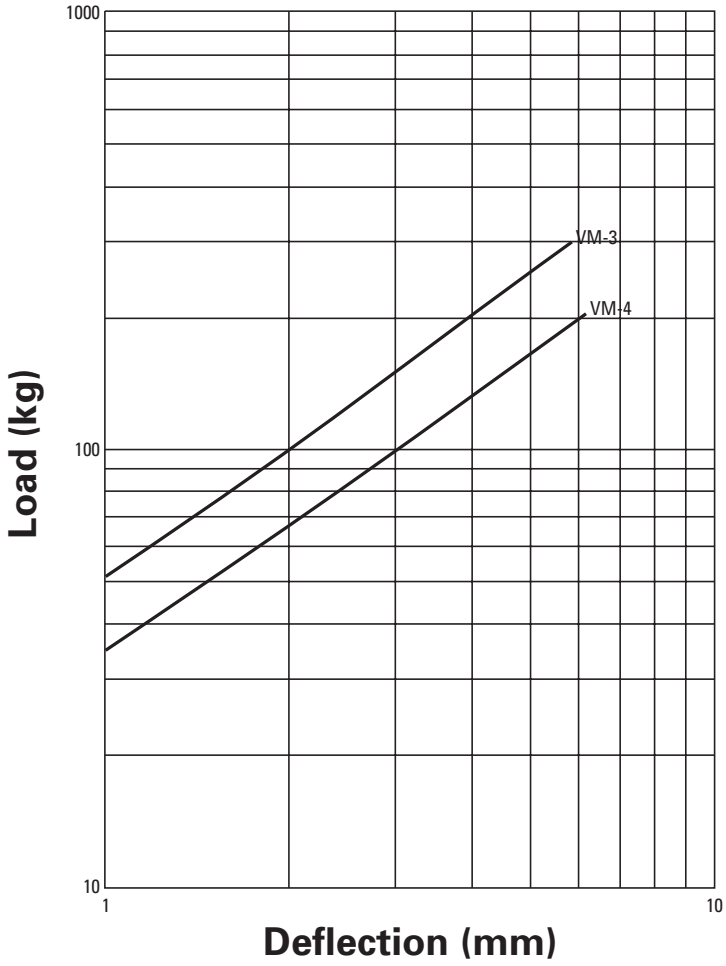
Sample isolator

VIB4 Seismic Vibration Isolators (Zone 4)

For regions where seismic tremors are experienced, this option can be used in place of the standard anti-vibration mounting arrangement. These seismic zone 4 vibration isolators are designed to withstand the high shear forces that can arise under such seismic activity as per the 1994 Uniform Building Code. Isolators are positioned between the engine/generator mounts and the generator set base frame. The vibration isolators are matched to ensure minimal oscillation levels during generator set operation.



Load vs Deflection



Diesel	
Engine Model	**Vib-Mt**
D25-6 D25-6S D30-8 D30-6S	VM-4
D40-4 D40-4S D50-4 D50-4S D60-4 D60-6S D80-6 D80-2S D100-6 D100-6S D125-6 D150-8 D175-2	VM-3

NC POWER SYSTEMS

SECTION 3

CATERPILLAR TECHNICAL DATA

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GENERATOR DATA

(AT400240)-ENGINE (BAA126422A)-CEM

FEBRUARY 01, 2022

For Help Desk Phone Numbers Click here

Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

Spec Information

Generator Specification

Frame: LC1514L **Type:** LC	**No. of Bearings:** 1
Winding Type: RANDOM WOUND	**Flywheel:** 11.5
Connection: PARALLEL STAR	**Housing:** 3
Phases: 3	**No. of Leads:** 12
Poles: 4	**Wires per Lead:** 1
Sync Speed: 1800	**Generator Pitch:** 0.6667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	10.0	90.1
0.5	20.0	91.6
0.75	30.0	90.9
1.0	40.0	89.6

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.0926	0.0801
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1307	0.1131
TRANSIENT - SATURATED X'_d	0.1851	0.1602
SYNCHRONOUS - DIRECT AXIS X_d	3.4269	2.9652
SYNCHRONOUS - QUADRATURE AXIS X_q	1.7134	1.4826
NEGATIVE SEQUENCE X_2	0.1116	0.0966
ZERO SEQUENCE X_0	0.0024	0.0021

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	0.9255
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.0500
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0100
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0050
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.0655
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0050
EXCITER TIME CONSTANT T_e	0.0200
ARMATURE SHORT CIRCUIT T_a	0.0075

Short Circuit Ratio: 0.32	Stator Resistance = 0.0684 Ohms	Field Resistance = 0.8382 Ohms

Voltage Regulation

Voltage level adjustment: +/-	5.0%
Voltage regulation, steady state: +/-	0.5%
Voltage regulation with 3% speed change: +/-	1.0%
Waveform deviation line - line, no load: less than	2.0%
Telephone influence factor: less than	50

Generator Excitation

	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	7.46 Volts	36.68 Volts	Volts
Excitation current	0.42 Amps	1.71 Amps	Amps

Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

Generator Mechanical Information

Center of Gravity

Dimension X	-287.0 mm	-11.3 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

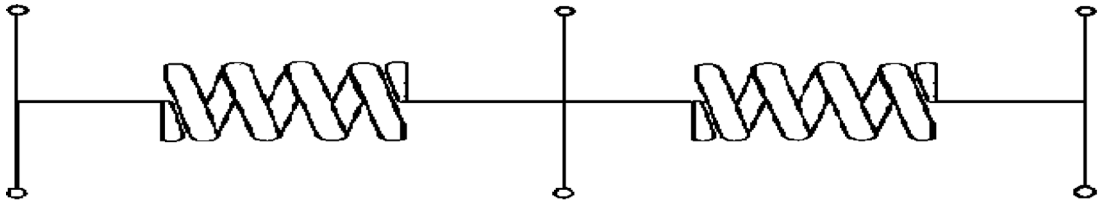
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT =	* Rotor WT =	* Stator WT =
171 kg	67 kg	104 kg
377 LB	148 LB	229 LB

Rotor Balance = 0.0508 mm deflection PTP

Overspeed Capacity = 125% of synchronous speed

Generator Torsional Data



J1 = Coupling and Fan | **J2 = Rotor** | **J3 = Exciter End**

TOTAL J = J1 + J2 + J3

K1 = Shaft Stiffness between J1 + J2 (Diameter 1)

K2 = Shaft Stiffness between J2 + J3 (Diameter 2)

J1	K1	Min Shaft Dia 1	J2	K2	Min Shaft Dia 2	J3
0.4 LB IN. s^2	3.8 MLB IN./rad	2.4 IN.	2.7 LB IN. s^2	4.4 MLB IN./rad	2.4 IN.	0.2 LB IN. s^2
0.044 N m s^2	0.433 MN m/rad	60.0 mm	0.306 N m s^2	0.502 MN m/rad	60.0 mm	0.022 N m s^2

Total J

3.3 LB IN. s^2

0.372 N m s^2

Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:		**Temperature Data: (Ambient 40 ^{0}C)**	
Heat Dissipated:	4.6 kW	**Stator Rise:**	130.0 ^{0}C
Air Flow:	7.8 m^3/min	**Rotor Rise:**	130.0 ^{0}C

Insulation Class: H

Insulation Reg. as shipped: 100.0 MΩ minimum at 40 ^{0}C

Thermal Limits of Generator

Frequency:	60 Hz
Line to Line Voltage:	208 Volts
B BR 80/40	40.0 kVA
F BR -105/40	45.5 kVA
H BR - 125/40	50.0 kVA
F PR - 130/40	50.0 kVA
H PR - 150/40	53.0 kVA
H PR27 - 163/27	55.0 kVA

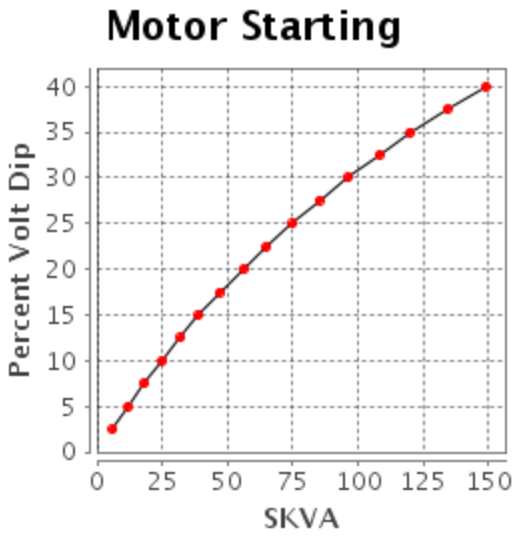
Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

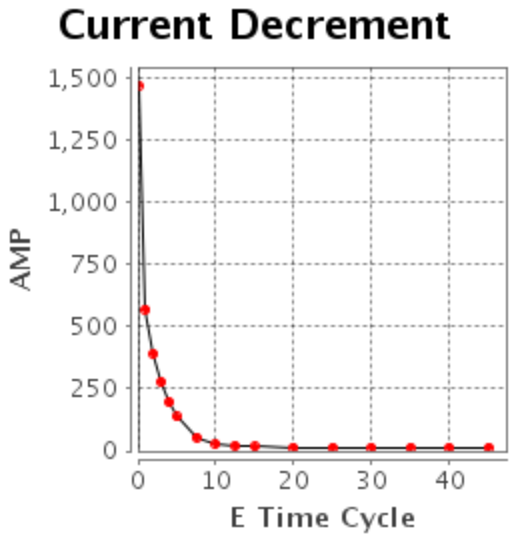
Starting Capability & Current Decrement
Motor Starting Capability (0.6 pf)

SKVA	Percent Volt Dip
6	2.5
12	5.0
18	7.5
25	10.0
32	12.5
39	15.0
47	17.5
56	20.0
65	22.5
75	25.0
85	27.5
96	30.0
108	32.5
120	35.0
134	37.5
149	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	1,472
1.0	571
2.0	392
3.0	279
4.0	196
5.0	137
7.5	55
10.0	29
12.5	21
15.0	17
20.0	15
25.0	15
30.0	15
35.0	15
40.0	15
45.0	15



Instantaneous 3 Phase Fault Current: 1472 Amps **Instantaneous Line - Line Fault Current:** 1156 Amps

Instantaneous Line - Neutral Fault Current: 1978 Amps

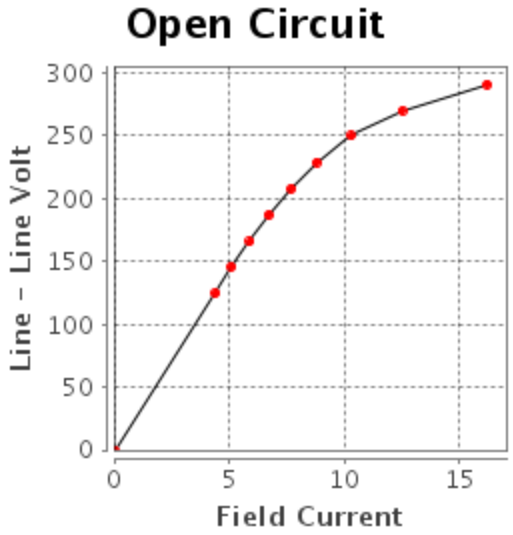
Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

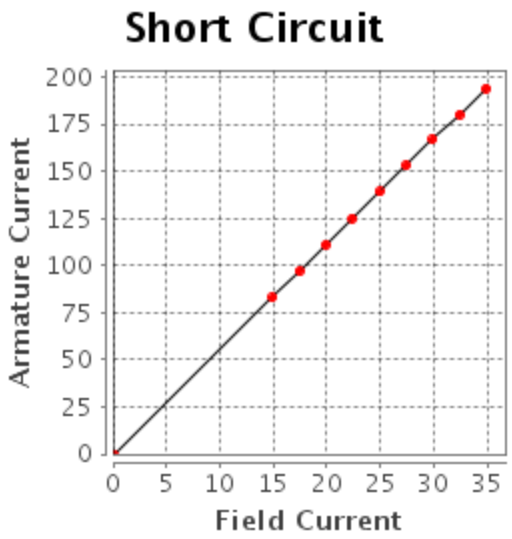
Generator Output Characteristic Curves
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
4.4	125
5.1	146
5.9	166
6.7	187
7.7	208
8.8	229
10.3	250
12.5	270
16.2	291



Short Circuit Curve

Field Current	Armature Current
0.0	0
14.9	83
17.4	97
19.9	111
22.4	125
24.9	139
27.4	153
29.9	167
32.4	180
34.9	194



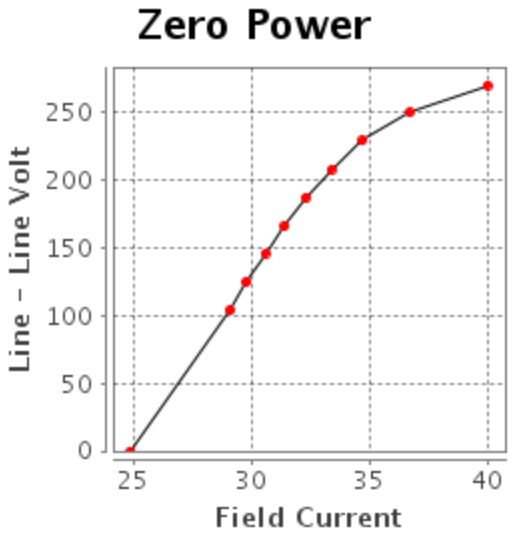
Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

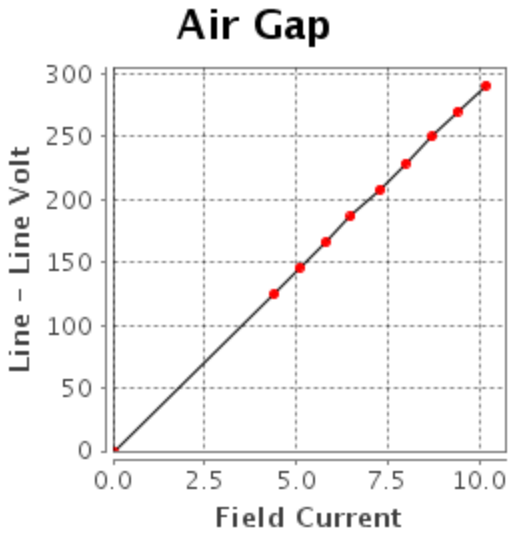
Generator Output Characteristic Curves
Zero Power Factor Curve

Field Current	Line - Line Volt
24.9	0
29.1	104
29.8	125
30.6	146
31.4	166
32.3	187
33.4	208
34.7	229
36.7	250
40.0	270



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
4.4	125
5.1	146
5.8	166
6.5	187
7.3	208
8.0	229
8.7	250
9.4	270
10.2	291

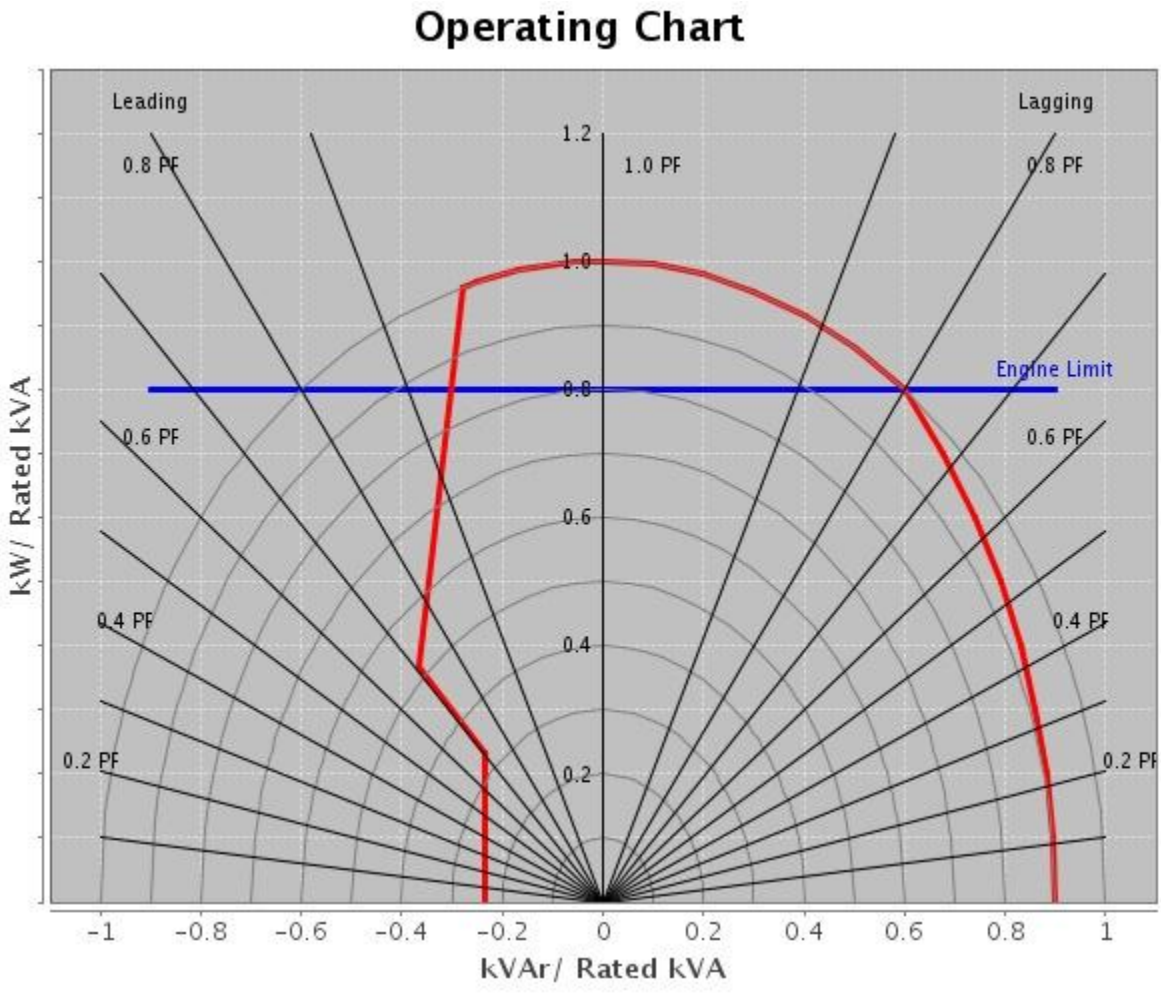


Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

Reactive Capability Curve



Selected Model

Engine: C4.4	**Generator Frame:** LC1514L	**Genset Rating (kW):** 40.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4676044	**Genset Rating (kVA):** 50.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 138.8
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 42423 /42397 /42214 /9681

GENERATOR INFORMATION (DM7900)

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1. Motor Starting
Motor starting curves are obtained in accordance with IEC60034, and are displayed at 0.6 power factor.

2. Voltage Dip
Prediction of the generator synchronous voltage dip can be made by consulting the plot for the voltage dip value that corresponds to the desired motor starting kVA value.

3. Definitions
A) Generator Keys
Frame: abbreviation of generator frame size
Freq: frequency in hertz.
PP/SB: prime/standby duty respectively
Volts: line - line terminal voltage
kW: rating in electrical kilo watts
Model: engine sales model

B) Generator Temperature Rise
The indicated temperature rises are the IEC/NEMA limits for standby or prime power applications. The quoted rise figures are maximum limits only and are not necessarily indicative of the actual temperature rise of a given machine winding.

C) Centre of Gravity
The specified centre of gravity is for the generator only. For single bearing, and two bearing close coupled generators, the center of gravity is measured from the generator/engine flywheel-housing interface and from the centreline of the rotor Shaft.

For two bearing, standalone generators, the center of gravity is measured from the end of the rotor shaft and from the centerline of the rotor shaft.

D) Generator Current Decrement Curves
The generator current decrement curve indicates the generator armature current arising from a symmetrical three-phase fault at the generator terminals. Generators equipped with AREP or PMG excitation systems will sustain 300% of rated armature current for 10 seconds.

E) Generator Efficiency Curves
The efficiency curve is displayed for the generator only under the given conditions of rating, voltage, frequency and power factor. This is not the overall generating set efficiency curve.

PACKAGE DATA [NAC147P]

FEBRUARY 01, 2022

For Help Desk Phone Numbers Click here

Feature Code:	NAC147P	**Rating Type:**	STANDBY	**Sales model Package:**	D40-2LC
Engine Sales Model:	C4.4	**Engine Arrangement Number:**	3837265	**Hertz:**	60
EKW W/F:	40.0	**Noise Reduction:**	0 dBA	**Back Pressure:**	0.0 inH2O

Engine Package Information

Engine Package Data

Package Cooling Information

Open Cooling Data

% Load	Airflow Rate scfm			Ambient Capability Sea Level (Deg F)			Ambient Capability 300 m (Deg F)			Ambient Capability 600 m (Deg F)			Ambient Capability 900 m (Deg F)		
	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O
100.0	4414	3778	3460	159	156	154	156	152	150	152	149	147	149	145	143
75.0	4414	3778	3460	168	165	165	165	161	161	161	158	158	158	154	154
50.0	4414	3778	3460	177	176	174	174	172	170	170	168	167	167	165	163
25.0	4414	3778	3460	186	185	183	183	181	179	179	177	176	176	174	172

SA Level 1 Canopy Cooling Data

% Load	Airflow Rate scfm	Ambient Capability Sea Level (Deg F)	Ambient Capability 300 m (Deg F)	Ambient Capability 600 m (Deg F)	Ambient Capability 900 m (Deg F)
100.0	4025	150	147	143	140
75.0	4025	158	154	150	147
50.0	4025	165	161	158	154
25.0	4025	174	170	167	163

WP Canopy - Industrial Cooling Data

% Load	Airflow Rate scfm	Ambient Capability Sea Level (Deg F)	Ambient Capability 300 m (Deg F)	Ambient Capability 600 m (Deg F)	Ambient Capability 900 m (Deg F)
100.0	4025	150	147	143	140
75.0	4025	158	154	150	147
50.0	4025	165	161	158	154
25.0	4025	174	170	167	163

Package Sound Information

Sound Comments :

SA Level 1 Canopy Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	86.9	85.5	85.3	83.0	81.9	79.4	76.1	73.7
30.0	75.0	86.4	84.6	84.9	82.3	81.4	79.0	75.8	72.9
20.0	50.0	86.0	83.7	84.3	81.7	81.0	78.7	75.4	72.3
10.0	25.0	85.6	82.6	83.6	81.2	80.7	78.4	74.9	71.7

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	73.8	73.0	75.8	70.2	68.6	66.6	62.6	60.5
30.0	75.0	73.4	72.6	74.8	69.5	68.3	66.2	62.3	59.9
20.0	50.0	73.0	72.3	73.1	68.9	68.1	65.8	61.9	59.3
10.0	25.0	72.6	71.9	70.7	68.2	68.0	65.5	61.3	58.8

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	67.8	67.0	69.8	64.2	62.6	60.6	56.6	54.5
30.0	75.0	67.4	66.6	68.8	63.5	62.3	60.2	56.3	53.9
20.0	50.0	67.0	66.3	67.1	62.9	62.1	59.8	55.9	53.3
10.0	25.0	66.6	65.9	64.7	62.2	62.0	59.5	55.3	52.8

WP Canopy - Industrial Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	98.8	97.6	93.3	93.3	94.9	92.2	87.6	80.0
30.0	75.0	97.0	94.9	91.4	91.7	93.0	90.5	86.2	79.0
20.0	50.0	95.1	91.9	89.4	90.2	90.9	88.6	84.5	78.1
10.0	25.0	93.0	88.8	87.3	88.6	88.6	86.4	82.6	77.3

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	84.5	80.8	79.2	79.4	79.4	78.3	75.5	70.2
30.0	75.0	83.0	78.8	77.8	78.2	78.0	76.6	73.8	68.7
20.0	50.0	81.3	76.7	75.6	76.9	76.3	74.6	71.8	67.1

10.0	25.0	79.3	74.5	72.7	75.3	74.4	72.3	69.5	65.5

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	78.5	74.8	73.2	73.4	73.4	72.3	69.5	64.2
30.0	75.0	77.0	72.8	71.8	72.2	72.0	70.6	67.8	62.7
20.0	50.0	75.3	70.7	69.6	70.9	70.3	68.6	65.8	61.1
10.0	25.0	73.3	68.5	66.7	69.3	68.4	66.3	63.5	59.5

Open Mechanical Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	91.9	87.6	88.9	85.2	87.9	85.6	80.1	76.0
30.0	75.0	91.5	86.9	88.3	84.6	87.5	85.4	79.7	74.2
20.0	50.0	91.1	85.8	87.3	84.1	87.3	85.1	79.4	73.1
10.0	25.0	90.8	84.4	85.8	83.5	87.3	84.5	79.0	72.7

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	81.9	77.6	78.9	75.2	77.9	75.6	70.1	66.0
30.0	75.0	81.5	76.9	78.3	74.6	77.5	75.4	69.7	64.2
20.0	50.0	81.1	75.8	77.3	74.1	77.3	75.1	69.4	63.1
10.0	25.0	80.8	74.4	75.8	73.5	77.3	74.5	69.0	62.7

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
40.0	100.0	75.9	71.6	72.9	69.2	71.9	69.6	64.1	60.0
30.0	75.0	75.5	70.9	72.3	68.6	71.5	69.4	63.7	58.2
20.0	50.0	75.1	69.8	71.3	68.1	71.3	69.1	63.4	57.1
10.0	25.0	74.8	68.4	69.8	67.5	71.3	68.5	63.0	56.7

GEN SET PACKAGE PERFORMANCE DATA [NAC147P]

FEBRUARY 01, 2022

For Help Desk Phone Numbers Click here

Performance Number: P3454C

Change Level: 00

Sales Model: C4.4 DITA
Combustion: DI
Aspr: TA
Engine Power: 40 W/F EKW 69 HP
Speed: 1,800 RPM
After Cooler: AA
Manifold Type:
Governor Type:
After Cooler Temp(F): 187
Turbo Quantity:
Engine App: GP
Turbo Arrangement:
Hertz: 60
Application Type: PACKAGE-DIE
Engine Rating: PGS
Strategy:
Rating Type: STANDBY
Certification: EPA TIER 3 -

General Performance Data 1

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
40	100	69	77.28	0.42	4.09	28.7	162.45	906.8	169.51
36	90	62	71.91	0.43	3.82	26.03	158.92	864.14	162.45
27	68	47	53	0.47	3.14	18.89	144.79	744.8	148.32
18	45	31	34.06	0.59	2.63	11.99	130.66	597.2	130.66
9	22	16	16.98	0.78	1.74	5.57	113.01	426.74	116.54

Engine Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO EXHAUST BTU/MN
40	100	2,195.2	2,945.9
36	90	2,024.6	2,689.9
27	68	1,632.2	2,041.6
18	45	1,256.8	1,404.7
9	22	875.8	779.1

EMISSIONS DATA

EPA TIER 3 - ********** J1

No notes were found for this certification...

REFERENCE EXHAUST STACK DIAMETER	0 IN
WET EXHAUST MASS	820.1 LB/HR
WET EXHAUST FLOW (-- STACK TEMP)	--
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	--
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	--
FUEL FLOW RATE	--

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:		**Lube Oil Press @ Rated Spd(PSI):**	0.0
Effective Serial No:		**Piston Speed @ Rated Eng SPD(FT/Min):**	--
Primary Engine Test Spec:		**Max Operating Altitude(FT):**	-3,277.6
Performance Parm Ref:		**PEEC Elect Control Module Ref**	
Performance Data Ref:	P3454C	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:		**Turbocharger Model**	
Certification Ref:	EPA TIER 3	**Fuel Injector**	
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	18.2	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	187	**Unit Injector Timing (MM):**	--
Crankcase Blowby Rate(CFH):	--	**Torque Rise (percent)**	0.0
Fuel Rate (Rated RPM) No Load(Gal/HR):	--	**Peak Torque Speed RPM**	1800
Lube Oil Press @ Low Idle Spd(PSI):	0.0	**Peak Torque (LB.FT):**	452.9

Reference Number: P3454C

EPA TIER 3 J1

Parameters Reference:

Radiator Performance Data [3539668]

February 01, 2022

For Help Desk Phone Numbers Click here

Component Performance Number: DM9989

Radiator Data

Radiator Part Number: 3539668
Radiator Type: 2.97CT
Front Area: 2.91 ft2
Radiator Dry Weight: 13.2 lbs
Radiator Wet Weight: NA lbs
Radiator Water Capacity High Temp Circuit: 1.0 gal
Radiator Water Capacity Low Temp Circuit: NA gal
Center of Gravity (X): 2.44 in (Distance from front face of core)
Center of Gravity (Y): 14.17 in (Distance from bottom of radiator support)
Center of Gravity (Z): 0.00 in (Distance from center line of core)

Engine Data

Performance Number: P3454C
Sales Model: C4.4 DITA
EKW: 40
Rating: STANDBY
Speed: 1800
Settings: NA
AC Temp Deg F: 186

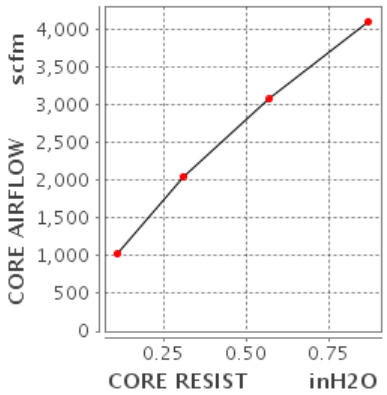
Combination Data

Pully Ratio: 1.25
Fan Power: 2.68204 hp

Ambient Restrictions (1/2 inH2O)			Ambient Restrictions (3/4 inH2O)			Ambient Restrictions (1.00 inH2O)		
984 Feet	2460 Feet	4921 Feet	984 Feet	2460 Feet	4921 Feet	984 Feet	2460 Feet	4921 Feet
--------- Max Ambient Pre-alarm Deg F ---------								
150	145	136	149	143	134	NA	NA	NA

Air Flow Restrictions (1/2 inH2O)	Air Flow Restrictions (3/4 inH2O)	Air Flow Restrictions (1.00 inH2O)
--------- scfm ---------		
4732	4555	NA

CORE RESIST inH2O	CORE AIRFLOW scfm
0.11	1,024.13
0.31	2,051.78
0.57	3,075.91
0.87	4,103.57



Reference Number: DM9989

No notes found...

Parameters Reference: TM6016

RADIATOR CORE DATA:

FOR OPEN GENERATOR SET ELECTRIC POWER APPLICATIONS, CORE AIR FLOW RESISTANCE DATA INCLUDES ENGINE, GENERATOR, AND COOLING PACKAGE. ADDITIONAL AIRFLOW RESISTANCE DUE TO CUSTOMER SUPPLIED ITEMS SUCH AS INLET/EXHAUST LOUVERS, SOUND ATTENUATION, OR INLET/EXHAUST AIR PIPEWORK IS NOT INCLUDED.

ALL OTHER APPLICATIONS OUTSIDE OF OPEN ELECTRIC POWER, CORE AIR FLOW RESISTANCE IS FOR FREE STANDING CORE ONLY.

CORE PERFORMANCE DATA IS BASED ON AN AIR DENSITY OF 1.20 KG/M3 (0.075 LB/CU FT)

AMBIENT CAPABILITY:

AMBIENT CAPABILITY AND ALTITUDE CAPABILITY LISTED ON THIS PAGE REFLECTS THE CAPABILITY OF THE COOLING SYSTEM AT THE MAXIMUM GENERATOR RATING. AMBIENT CAPABILITY FOR STANDBY AND MISSION CRITICAL STANDBY RATINGS REPORTED AGAINST A JACKET WATER ENGINE EXIT TEMPERATURE LIMIT OF 104C (219F). ALL OTHER RATINGS REPORTED AT 99C (210F).

AMBIENT AND ALTITUDE CAPABILITY MUST BE VERIFIED FOR THE ENGINE AND GENERATOR IN THE ENGINE PERFORMANCE SECTION OF TMI.

NON TIER 4 EMISSION RATINGS ASSUME 4C (7F) AIR TO CORE RISE, TIER 4 EMISSION RATINGS ASSUME 6C (9F).

ALL PERFORMANCE SHOWN WITH 50/50 GLYCOL COOLANT.

LAST UPDATED: 09/11/2020

Reference Number: P3454C **Version Symbol:** **Change Level:**

Sales Model: C4.4 DI T AA **Eff. Serial Number Prefix:** **Engr. Model:**

Description	Answer	Unit
Air Intake System		
The installed system must comply with the system limits below for all emissions certified engines to assure regulatory compliance.		
MAX ALLOW INTAKE RESTR W/CLEAN ELEMENT	20.1	IN WTR
MAX ALLOW INTAKE RESTR W/DIRTY ELEMENT	32.1	IN WTR
ALLOW PRESS DROP-COMPR OUT TO MANF IN	3.0	IN HG
MAX TURBO INLET AIR TEMPERATURE	77	DEG F
Cooling System		
ENGINE ONLY COOLANT CAPACITY	0.0	GAL
REGULATOR START-TO-OPEN TEMP	32	DEG F
REGULATOR FULL OPENING TEMPERATURE	32	DEG F
Engine Spec System		
CYLINDER ARRANGEMENT		
NUMBER OF CYLINDERS	4	CYL
CYLINDER BORE DIAMETER	4.1339	IN
PISTON STROKE	5.0000	IN
TOTAL CYLINDER DISPLACEMENT	269	CU IN
COMPRESSION RATIO (TO ONE)	18.2	
CRANKSHAFT ROTATION (FROM FLYWHEEL END)	CCW	
CYLINDER FIRING ORDER		
STROKES/COMBUSTION CYCLE	4	STROKES
Exhaust System		
The installed system must comply with the system limits below for all emissions certified engines to assure regulatory compliance.		
Fuel System		
MAX ALLOW FUEL SUPPLY LINE RESTRICTION	0.0	IN HG
MAX ALLOW FUEL RETURN LINE RESTR	0.0	IN HG
FUEL SYSTEM TYPE		
Lube System		
MAXIMUM ALLOWABLE OIL TEMP	32	DEG F
MIN LI OP W/SAE 10W30 OIL @ 99 DEG C	0.0	PSI
Mounting System		
ENG WET WT W/OIL AND WATER W/O FUEL	0	LB
DRY WT ENG ONLY (DRAINED OF FLUIDS)	884	LB
ENGINE LENGTH	32.8346	IN
ENGINE HEIGHT	32.2047	IN
ENGINE WIDTH	23.5433	IN
Starting System		

Content Owner: Commercial Processes Division
Web Master(s): PSG Web Based Systems Support
Current Date: 2/1/2022, 3:03:39 PM

NC POWER SYSTEMS

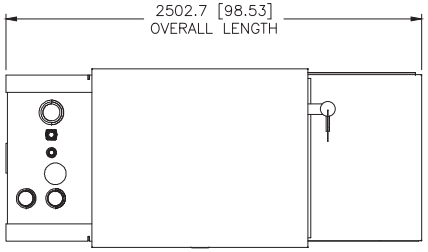
SECTION 4

ENGINEERING DRAWINGS

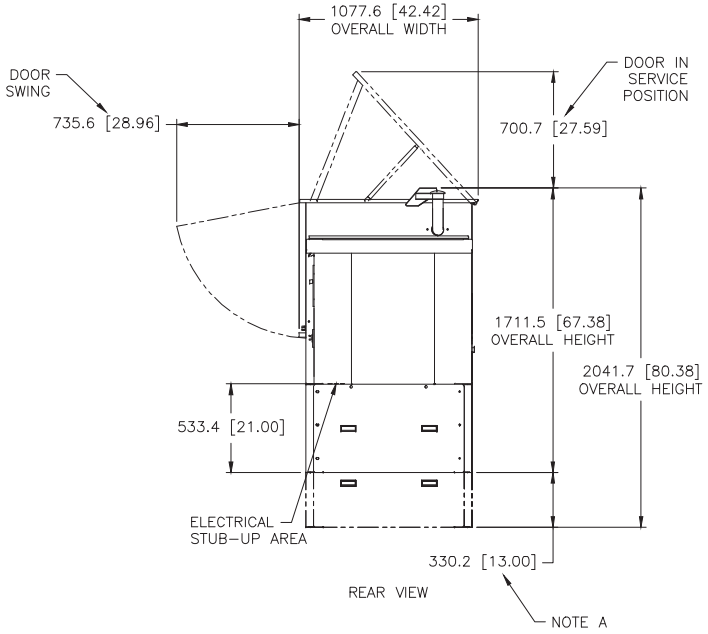
METRIC 483-7627

QTY	ENGINE CONNECTIONS	SIZE	SHEET
1	COOLANT DRAIN	1/4-18 THD	2
1	EXHAUST	ø63.3 [ø2.49]	2
1	OIL DRAIN	1/4-18 THD	2

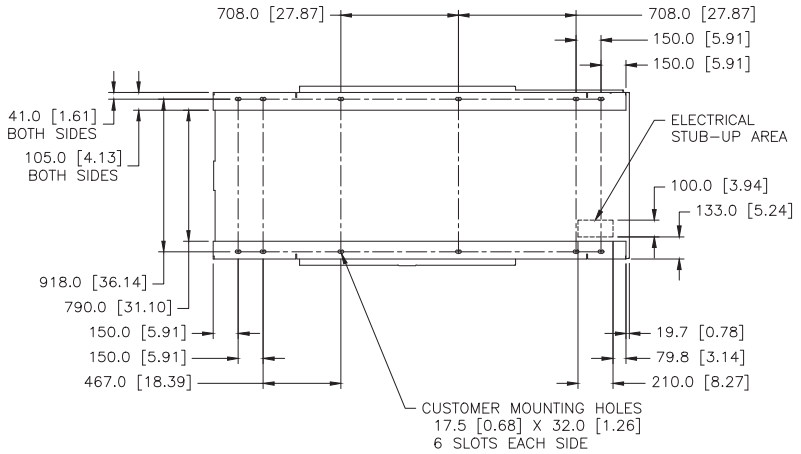
QTY	POSSIBLE TANK CONNECTIONS	SIZE	SHEET
1	BASIN TANK EMERGENCY VENT	3" NPT THD	3
1	FUEL FILLER	4" NPT THD	3
1	MAIN TANK EMERGENCY VENT	3" NPT THD	3
1	NORMAL VENT	2" NPT THD	3
1	RUPTURE BASIN ALARM	1" NPTF THD	3
2	SPARE PORT	1" NPTF THD	3



TOP VIEW



REAR VIEW



FOOTPRINT
(DIMENSIONED OUTLINE VIEW FROM ABOVE)

MODEL	TYPE	PRICING AR	ENCLOSURES	TANK GROUP	TANK CAPACITY
C4.4	Y	LS-2430 CHG 04	LS-2425 CHG 02	LS-2410 CHG 02	137 US GAL
		LS-2431 CHG 04	LS-2426 CHG 02		
		LS-2698 CHG 02	LS-2433 CHG 01	LS-2411 CHG 03	255 US GAL
		LS-2699 CHG 03	LS-2434 CHG 01		

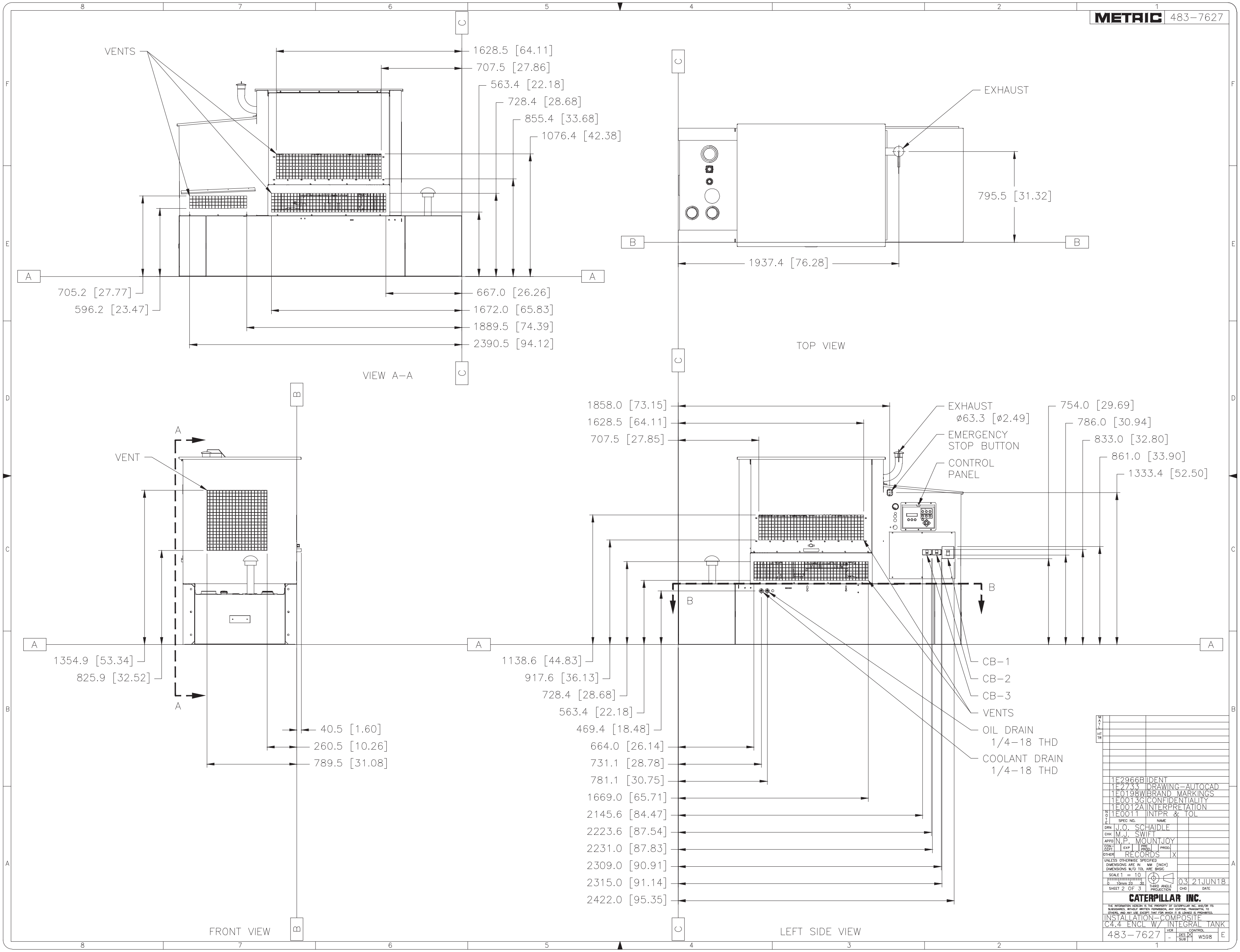
NOTE A: DIM FROM THE BOTTOM OF THE 137 US GAL TANK TO THE BOTTOM OF THE 255 US GAL TANK

1E2966 IDENT
1E2733 DRAWING-AUTOCAD
1E0138 BRAND MARKINGS
1E0013 CONFIDENTIALITY
1E0012 INTERPRETATION
1E0011 INTPR & TOL

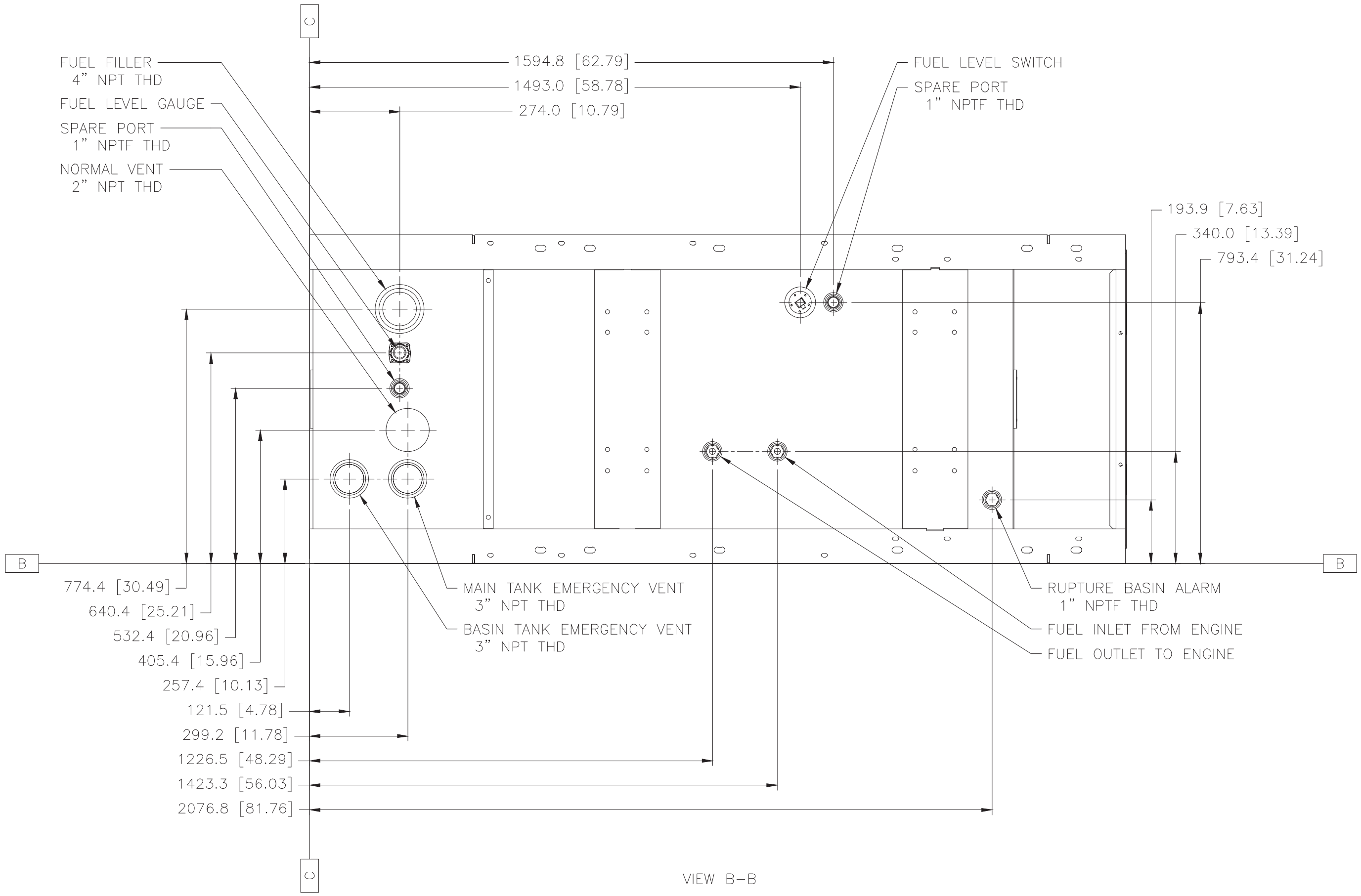
DRN J.O. SCHAIDLE
CHK M.J. SWIF
APPD N.P. MOUNTJOY
DO NOT SCALE DRAWING
OTHER RECORDS X
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM [INCH]
DIMENSIONS W/O TOL ARE BASIC
SCALE 1 = 10
SHEET 1 OF 3
THIRD ANGLE PROJECTION
03 21JUN18
CHG DATE

CATERPILLAR INC.

INSTALLATION-COMPOSITE
C4.4 ENCL W/ INTEGRAL TANK
483-7627 - DRG 24 SUB 1 W598 E


METRIC
483-7627
VENTS
1628.5 [64.11]
707.5 [27.86]
563.4 [22.18]
728.4 [28.68]
855.4 [33.68]
1076.4 [42.38]
705.2 [27.77]
596.2 [23.47]
667.0 [26.26]
1672.0 [65.83]
1889.5 [74.39]
2390.5 [94.12]
VIEW A–A
EXHAUST
795.5 [31.32]
1937.4 [76.28]
TOP VIEW
VENT
1354.9 [53.34]
825.9 [32.52]
40.5 [1.60]
260.5 [10.26]
789.5 [31.08]
FRONT VIEW
1858.0 [73.15]
1628.5 [64.11]
707.5 [27.85]
EXHAUST
ø63.3 [ø2.49]
EMERGENCY
STOP BUTTON
CONTROL
PANEL
754.0 [29.69]
786.0 [30.94]
833.0 [32.80]
861.0 [33.90]
1333.4 [52.50]
1138.6 [44.83]
917.6 [36.13]
728.4 [28.68]
563.4 [22.18]
469.4 [18.48]
CB–1
CB–2
CB–3
VENTS
OIL DRAIN
1/4–18 THD
COOLANT DRAIN
1/4–18 THD
664.0 [26.14]
731.1 [28.78]
781.1 [30.75]
1669.0 [65.71]
2145.6 [84.47]
2223.6 [87.54]
2231.0 [87.83]
2309.0 [90.91]
2315.0 [91.14]
2422.0 [95.35]
LEFT SIDE VIEW
1E2966B IDENT
1E2733 DRAWING–AUTOCAD
1E0198W BRAND MARKINGS
1E0013G CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
DRN J.O. SCHAIDLE
CHK M.J. SWIFT
APPD N.P. MOUNTJOY
RECORDS
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM [INCH]
SCALE 1 = 10
SHEET 2 OF 3
THIRD ANGLE PROJECTION
03 21JUN18
CATERPILLAR INC.
INSTALLATION–COMPOSITE
C4.4 ENCL W/ INTEGRAL TANK
483–7627
W598
E

METRIC 483-7627



VIEW B-B

SPEC NO.	NAME
1E2966B	IDENT
1E2733	DRAWING-AUTOCAD
1E0198W	BRAND MARKINGS
1E0013G	CONFIDENTIALITY
1E0012A	INTERPRETATION
1E0011	INTPR & TOL

DRN J.O. SCHAIDLE
CHK M.J. SWIFT
APPD N.P. MOUNTJOY
CON-CEPT | EXP | PRE PROD. | PROD.
OTHER RECORDS X

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM [INCH]
DIMENSIONS W/O TOL ARE BASIC

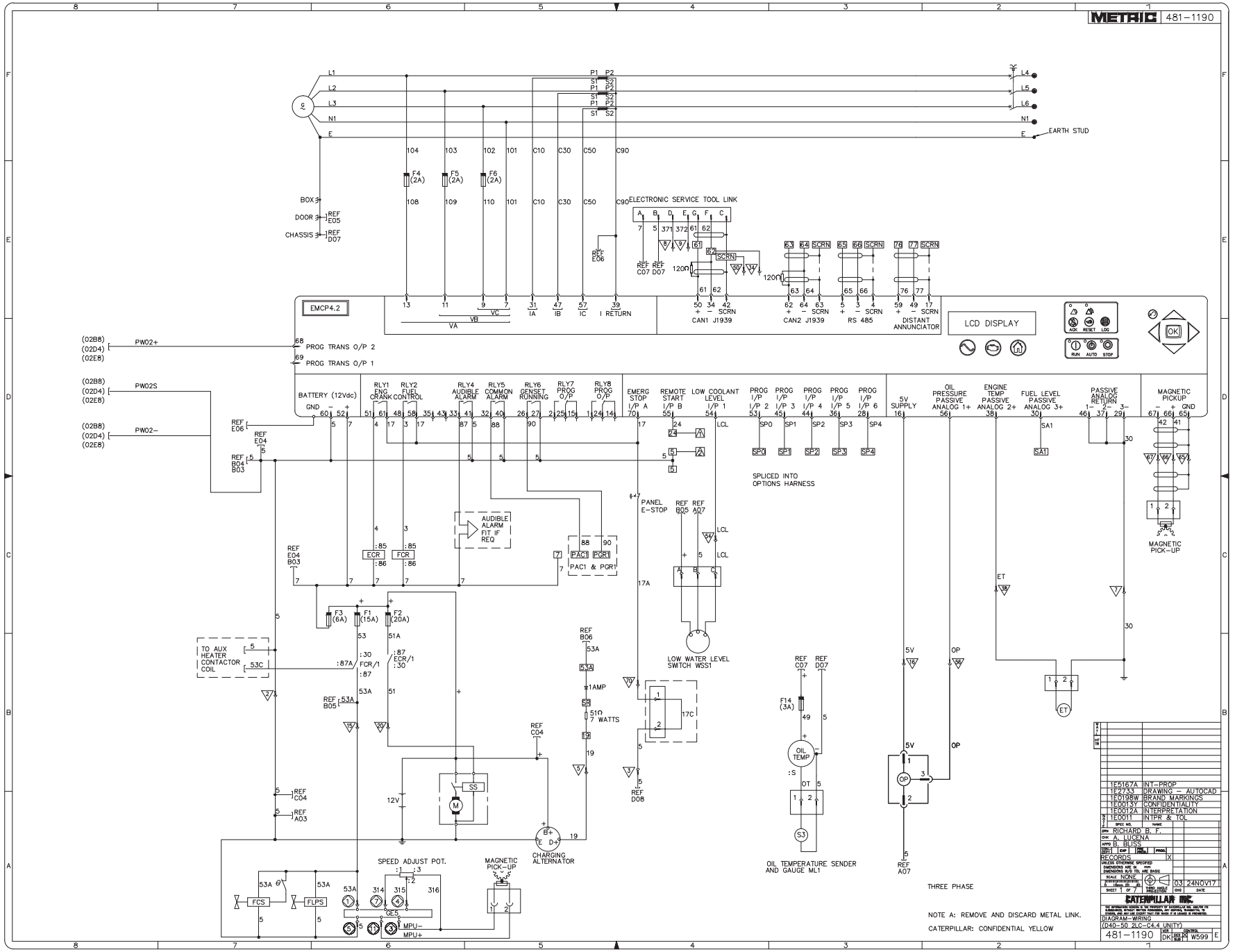
SCALE 1 = 5
SHEET 3 OF 3
THIRD ANGLE PROJECTION

CHG 03 DATE 21JUN18

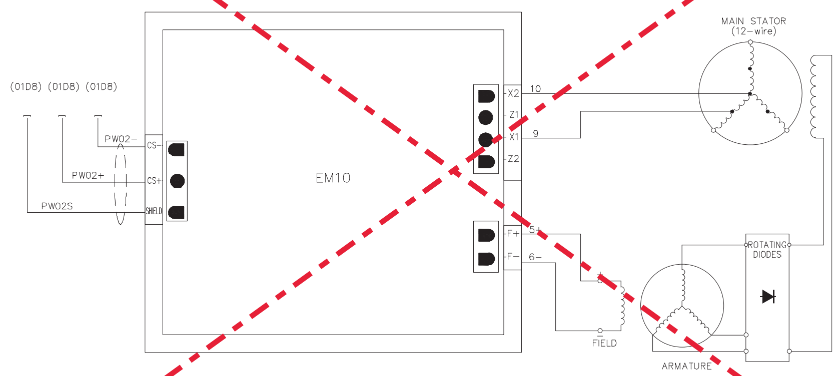
CATERPILLAR INC.

INSTALLATION-COMPOSITE
C4.4 ENCL W/ INTEGRAL TANK

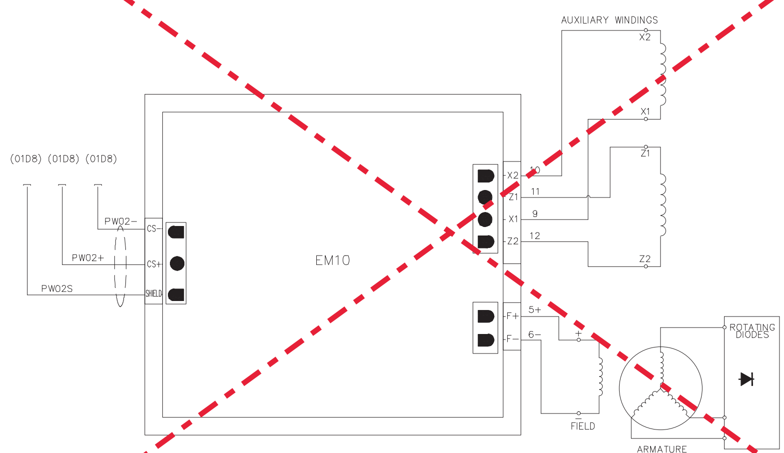
483-7627 VER - CONTROL DES ☒ SUB W598 E


METRIC 481-1190
L1
L2
L3
N1
E
L4
L5
L6
N1
E
EARTH STUD
P1 P2
S1 S2
104 103 102 101 C10 C30 C50 C90
F4 (2A)
F5 (2A)
F6 (2A)
BOX
DOOR
CHASSIS
REF E05
REF D07
ELECTRONIC SERVICE TOOL LINK
REF E06
REF C07
REF D07
120Ω
SCRN
CAN1 J1939
CAN2 J1939
RS 485
DISTANT ANNUNCIATOR
EMCP4.2
13 11 9 7 31 47 57 39
VC
VB
VA
IA
IB
IC
I RETURN
LCD DISPLAY
ACK RESET LOG
RUN AUTO STOP
OK
(02B8) (02D4) (02E8)
PW02+
PW02S
PW02–
68 PROG TRANS O/P 2
69 PROG TRANS O/P 1
BATTERY (12Vdc)
GND – +
RLY1 ENG CRANK
RLY2 FUEL CONTROL
RLY4 AUDIBLE ALARM
RLY5 COMMON ALARM
RLY6 GENSET RUNNING
RLY7 PROG O/P
RLY8 PROG O/P
EMERG STOP I/P A
REMOTE START I/P B
LOW COOLANT LEVEL I/P 1
PROG I/P I/P 2
PROG I/P I/P 3
PROG I/P I/P 4
PROG I/P I/P 5
PROG I/P I/P 6
5V SUPPLY
OIL PRESSURE PASSIVE ANALOG 1+
ENGINE TEMP PASSIVE ANALOG 2+
FUEL LEVEL PASSIVE ANALOG 3+
PASSIVE ANALOG RETURN 1– 2– 3–
MAGNETIC PICKUP – + GND
SPO SP1 SP2 SP3 SP4
SPLICED INTO OPTIONS HARNESS
MAGNETIC PICK–UP
REF E04
REF B04
REF B03
AUDIBLE ALARM FIT IF REQ
ECR :85 :86
FCR :85 :86
PAC1 PGR1
PAC1 & PGR1
PANEL E–STOP
REF B05
REF A07
LOW WATER LEVEL SWITCH WSS1
F3 (6A)
F1 (15A)
F2 (20A)
TO AUX HEATER CONTACTOR COIL
53C
:30 :87A FCR/1 :87
:87 ECR/1 :30
51A
51
53A
REF B06
1AMP
510Ω 7 WATTS
17C
REF C04
REF A03
12V
SS
M
B+ E D+
CHARGING ALTERNATOR
SPEED ADJUST POT.
MAGNETIC PICK–UP
FCS
FLPS
314 315 316
CE5
MPU–
MPU+
F14 (3A)
OIL TEMP
OT
OIL TEMPERATURE SENDER AND GAUGE ML1
5V
OP
REF A07
THREE PHASE
NOTE A: REMOVE AND DISCARD METAL LINK.
CATERPILLAR: CONFIDENTIAL YELLOW
1E5167A INT–PROP
1E2733 DRAWING – AUTOCAD
1E0198W BRAND MARKINGS
1E0013Y CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
DRN RICHARD B. F.
CHK A. LUCENA
APP B. BLISS
RECORDS
SCALE NONE
SHEET 1 OF 7
CATERPILLAR INC.
DIAGRAM–WIRING
(D40–50 2LC–C4.4 UNITY)
481–1190
DK 03 W599
03 24NOV17

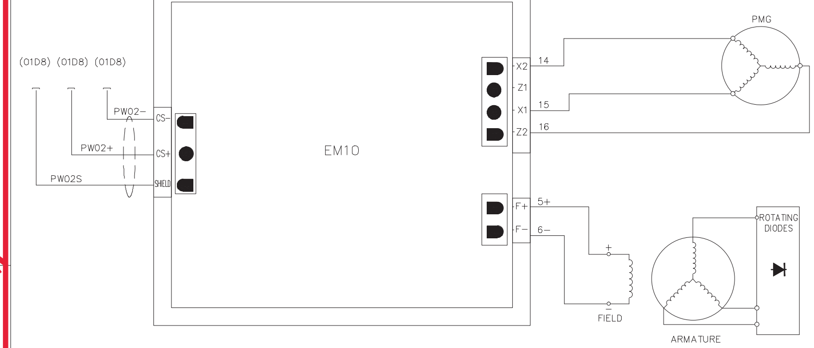
EM10 IVR CONNECTION DIAGRAM
SELF EXCITATION (SHUNT)



EM10 IVR CONNECTION DIAGRAM
AUXILIARY EXCITATION (AREP), 4-WIRE



EM10 IVR CONNECTION DIAGRAM
PERMANENT MAGNET (PM) EXCITATION



FOR NOTES SEE SHEET 1

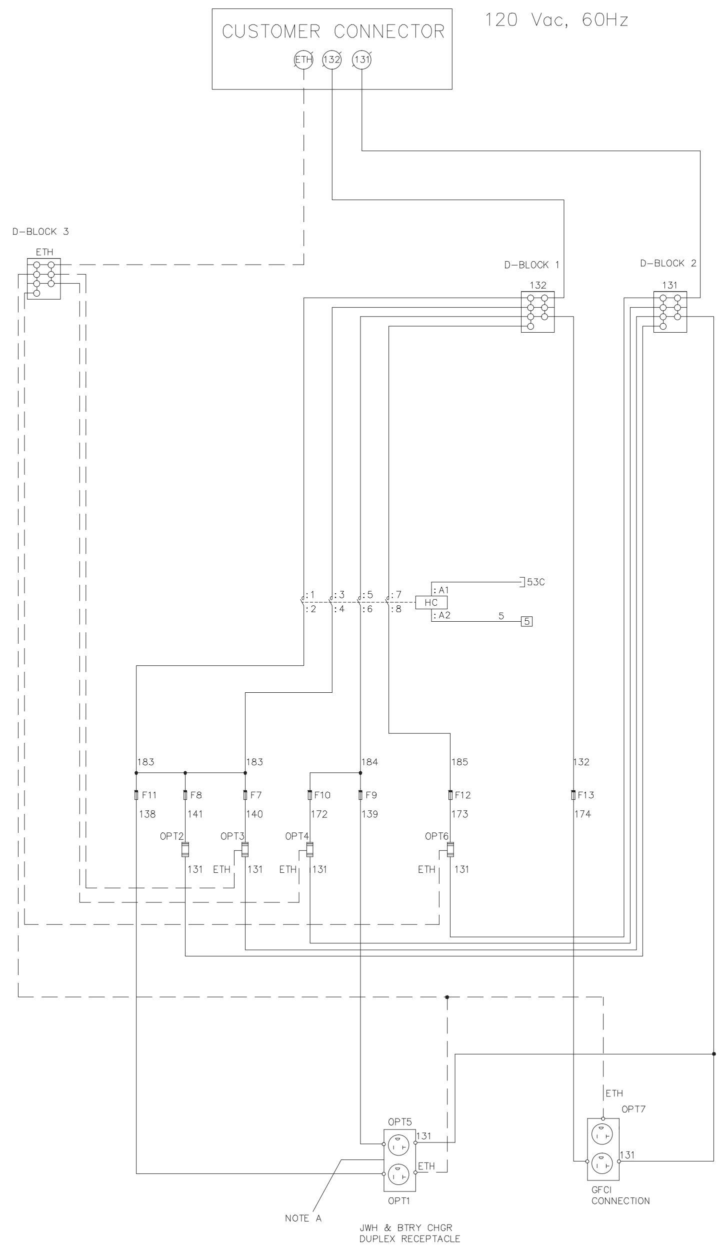
SPEC NO.	NAME
1E5167A	INT-PROP
1E2733	DRAWING - AUTOCAD
1E0198W	BRAND MARKINGS
1E0013Y	CONFIDENTIALITY
1E0012A	INTERPRETATION
1E0011	INTPR & TOL

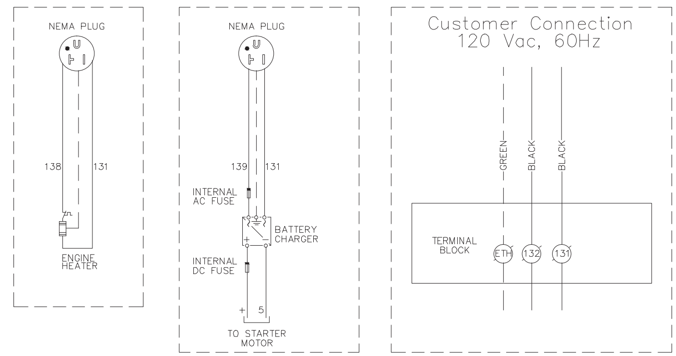
DRN RICHARD B. F.
CHK A. LUCENA
APPD B. BLISS
CON-CEPT EXP PRE PROD. PROD.
RECORDS X
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS W/O TOL ARE BASIC
SCALE NONE
SHEET 3 OF 7
THIRD ANGLE PROJECTION
CHG 03 DATE 24NOV17

CATERPILLAR INC.

DIAGRAM-WIRING
(D40-50 2LC-C4.4 UNITY)

481-1190 VER DK CONTROL DES SUB W599 E





OPTION GROUPING – BASE GROUP C4.4

OPTION NUMBER	SET DESCRIPTION	FUSE DESCRIPTION	FUSE DESCRIPTION
OPTION 1	JACKET WATER HEATER RECEPTACLE	F11 – 15AMP	WHH, AH1H, EBH, EOS, PBC1ONU
OPTION 2	ALT HEATER	F8 – 4AMP	
OPTION 3	BATTERY HEATER	F7 – 2AMP	
OPTION 4	SUMP HEATER	F10 – 2AMP	
OPTION 5	BATTERY CHARGER RECEPTACLE	F9 – 10AMP	

OPTION GROUPING – ADDITION C4.4

OPTION NUMBER	SET DESCRIPTION	FUSE DESCRIPTION	FUSE DESCRIPTION
OPTION 6	PROVISION FOR CANOPY SPACE HEATER	F12 – 15AMP	CABH

OPTION GROUPING – ADDITION C4.4

OPTION NUMBER	SET DESCRIPTION	FUSE DESCRIPTION	FUSE DESCRIPTION
OPTION 7	20AMP GFCI CUSTOMER RECEPTACLE	F13 – 20AMP	GFCI

OPTION GROUPING – ADDITION C4.4

OPTION NUMBER	SET DESCRIPTION	FUSE DESCRIPTION	FUSE DESCRIPTION
OPTION 7	JACKET WATER HEATER RECEPTACLE	F11 – 15AMP	WHHH

FOR NOTES SEE SHEET 1

CATERPILLAR: CONFIDENTIAL YELLOW

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1E0012A	INTERPRETATION
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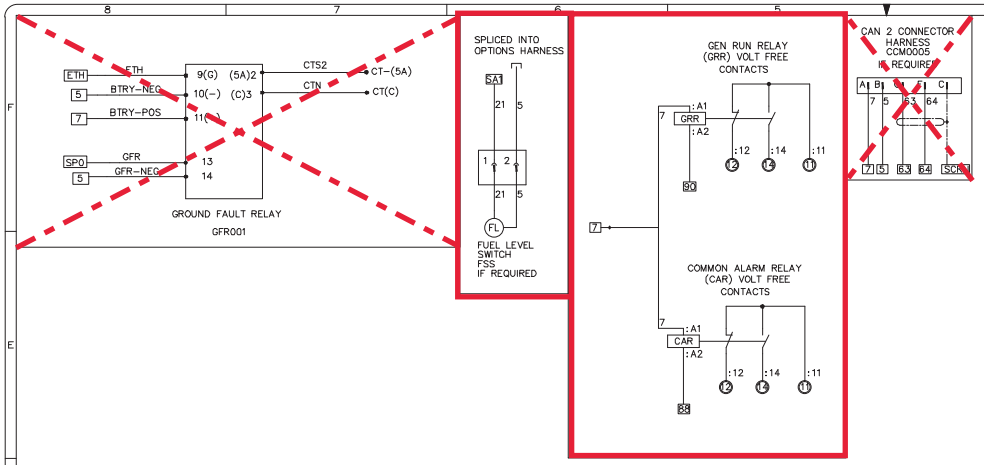
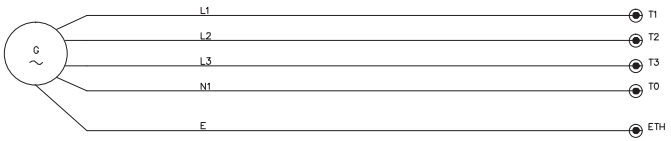
CONCEPT | EXP | PRE PROD. | PROD.
RECORDS X
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS W/O TOL ARE BASIC
SCALE NONE
SHEET 4 OF 7
THIRD ANGLE PROJECTION
CHG 03 DATE 24NOV17

CATERPILLAR INC.

DIAGRAM-WIRING
(D40-50 2LC-C4.4 UNITY)

481-1190 VER DK CONTROL DES SUB W599 E





BUS BAR

FOR NOTES SEE SHEET 1
CATERPILLAR: CONFIDENTIAL YELLOW

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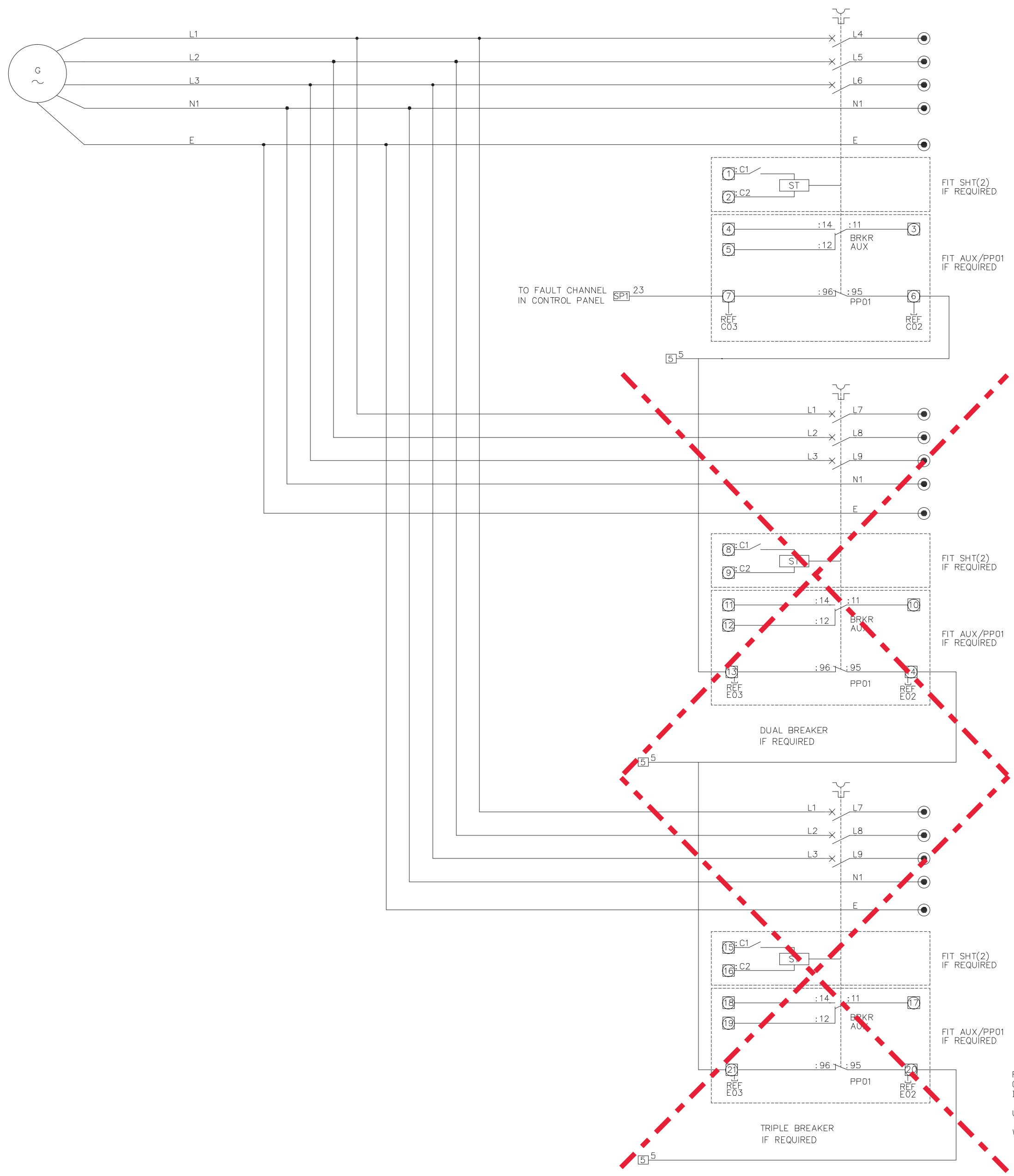
DRN RICHARD, B. F.
CHK A. LUCENA
APP D. BLISS
RECORDS X
SCALE NONE
SHEET 5 OF 7
03 24NOV17

CATERPILLAR INC.

DIAGRAM-WIRING
(D40-50 2LC-C4.4 UNITY)
481-1190
W599

METRIC 481–1190



FOR DUAL AND TRIPLE BREAKER AUX SWITCH OPTION , PLEASE CONNECT WIRE 5 FROM ONE BREAKER TO WIRE 23 OF THE OTHER BREAKER TO CREATE SERIES CIRCUIT.

USE INSULATED CRIMP SPLICE TO MAKE CONNECTION.

WIRE 23 AND WIRE 5 CORRESPONDS TO WIRE ID OF HARNESS

FOR NOTES SEE SHEET 1

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DRN RICHARD B. F.
CHK A. LUCENA
APPD B. BLISS
CON-CEPT | EXP | PRE PROD. | PROD.
RECORDS X
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS W/O TOL ARE BASIC
SCALE NONE
SHEET 6 OF 7
THIRD ANGLE PROJECTION
CHG 03 DATE 24NOV17

CATERPILLAR INC.

DIAGRAM–WIRING
(D40–50 2LC–C4.4 UNITY)

481–1190 VER DK CONTROL DES SUB W599 E

METRIC 481–1190

ABBREVIATIONS

ALT	ALTERNATOR
AVR	AUTOMATIC VOLTAGE REGULATOR
AC	ALTERNATING CURRENT
DC	DIRECT CURRENT
SCRN	SCREEN FROM SCREEN CABLE
RLY	RELAY
I/P	INPUT
CAR	COMMON ALARM RELAY
GRR	GENERATOR RUN RELAY
FCS	FUEL CONTROL SOLENOID
FCR	FUEL CONTROL RELAY
ECR	ENGINE CRANK RELAY
SSR	STARTER SOLENOID
FLPS	FUEL LIFT PUMP SOLENOID
PMG	PERMANENT MAGNET GENERATOR
IVR	INTEGRATED VOLTAGE REGULATOR
EM10	EXCITATION MODULE 10
GND	GROUND
HC	HEATER CONTACTOR
GRR	GENERATOR RUN RELAY
CAR	COMMON ALARM RELAY

SYMBOLS

FUSE

EMERGENCY STOP PUSHBUTTON

RELAY COIL (R, 85, 86)

SCREEN CABLE

DIODE

RELAY CONTACT N/O (R/1, 30, 87)

RELAY CONTACT N/C (R/1, 30, 87A)

EARTH

CIRCUIT BREAKER

RESISTOR

CURRENT TRANSFORMER (P1, P2, S1, S2)

BUZZER / SIREN

SOLENOID

2 WAY DEUTSCH CONNECTOR (1, 2)

POTENTIOMETER

STARTER MOTOR (M)

EARTH

BATTERY (12V)

INTERNAL PANEL TERMINAL (19)

CONTROLLER 70–WAY CONNECTOR (58)

DC 70 PIN CONNECTOR

POWER TERMINAL

3 WAY DEUTSCH CONNECTOR (A, B, C)

4 WAY DEUTSCH CONNECTOR (1, 2, 3, 4)

ELECTRONIC GOVERNOR SOCKET CONNECTOR (4)

INTERNAL PANEL AC SENSING TERMINAL (5)

4 WAY MALE MATE N' LOCK ALTERNATOR CONNECTOR (1, 2, 3, 4)

4 WAY FEMALE MATE N' LOCK ALTERNATOR CONNECTOR (1, 2, 3, 4)

6 WAY MALE MATE N' LOCK ALTERNATOR CONNECTOR (1, 2, 3, 4, 5, 6)

6 WAY FEMALE MATE N' LOCK ALTERNATOR CONNECTOR (1, 2, 3, 4, 5, 6)

CUSTOMER INTERFACE CONNECTION TERMINAL (A)

CUSTOMER CIRCUIT BREAKER AUXILIARY/SHUNT TRIP CONNECTION TERMINAL (7)

FOR NOTES SEE SHEET 1

CATERPILLAR: CONFIDENTIAL YELLOW

SPEC NO.	NAME
1E5167A	INT–PROP
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1E0198W	BRAND MARKINGS
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1E0012A	INTERPRETATION
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DRN RICHARD B. F.
CHK A. LUCENA
APPD B. BLISS

CON–CEPT | EXP | PRE PROD. | PROD.

RECORDS X

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN mm
DIMENSIONS W/O TOL ARE BASIC

SCALE NONE
SHEET 7 OF 7
THIRD ANGLE PROJECTION

CHG	DATE
03	24NOV17

CATERPILLAR INC.

DIAGRAM–WIRING
(D40–50 2LC–C4.4 UNITY)

481–1190 VER DK CONTROL DES SUB W599 E

NC POWER SYSTEMS

CAT

SECTION 5

AUTOMATIC TRANSFER SWITCH

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Picture shown may not reflect actual configuration

Cat® ATC Contactor-based Automatic Transfer Switch (ATS)

Cat® transfer switches are designed for a variety of standby power applications. They provide flexibility, reliability, and value in a compact package and are available from 40-3000A. The open and delayed transition contactor-based ATS provides fully functioning transfer in applications where a momentary loss of power is acceptable during transfer and retransfers between normal and emergency power supply.

The closed transition contactor-based ATS is designed to meet application requirements where emergency backup power is required with no momentary loss of power by connecting both sources before the transfer occurs. Closed transition also permits periodic testing of the emergency power source without interrupting power to the loads.

Features

- ATC-300+ or ATC-900 microprocessor-based controller
- Voltage and frequency sensing
- High withstand and closing ratings
- Multiple field programmable set points
- Status display including switch position indication
- Source availability indication
- Source 1 and Source 2 auxiliary contacts
- True RMS voltage and frequency sensing
- Programmable plant exerciser
- System test pushbutton
- Mimic diagram
- Double-throw, mechanically interlocked transfer mechanism
- Switch position indication
- Status display
- Double-throw UL 1008 2- and 3-position contactors

Options

- 2- or 4-position test switch
- Multiple metering options available
- Delayed transition and closed transition
- Selectable automatic or non-automatic operation
- Space heaters (recommended for use in outdoor enclosures)
- Surge suppression
- Remote communications
- Load shed from emergency
- Field-selectable, multi-ratio, control voltage transformer 50/60 Hz

Optional Delayed Transition Includes:

- Time delay neutral
- Pre-transfer signal with 1 N.O. and 1 N.C. contacts

Ratings

- Wall mount 40-400A, 2-, 3- or 4-pole
- Floor-standing 600-1600A 2-, 3-, or 4-pole
- Open, delayed, or closed transition 2000-3000A, 480V, 3- or 4-pole in a floor-standing enclosure
- Up to 600 VAC, 50/60 Hz for 40-1200A
- 100% rated
- UL 1008 listed
- CSA C22.2 No. 178 certified
- Seismic IBC 2006, CBC 2007 and OSHPD

Contact Composition

Caterpillar uses silver composition contacts designed to meet the stringent requirements of UL 1008. All contactors are designed so that the contacts can be visually inspected without major disassembly and are protected by arcing contacts.

Controls and Wiring

All control relays and industrial-grade relays are totally encapsulated to minimize exposure to dust and dirt. Lugs are 90ºC rated and all control wire is #16 AWG, type XLPE with a 125°C temperature rating.

Enclosure

The ATS is housed in rugged steel NEMA 1, 3R, or 12 enclosure which is seismic qualified (BOCA, CBC, IBC, UBC, OSHPD). ATS enclosures have three door hinges to ensure proper support of the door and door-mounted devices. The hinges have removable hinge pins to facilitate door removal for easy wall mounting or service and are supplied with padlockable latches.

Testing Standards

- UL 991 UL standards for safety tests for safety-related controls employing solid-state devices
- UL 1008 dielectric test (endurance, withstand, etc.)
- IEEE® 472 (ANSI C37.90A) ringing wave immunity/voltage surge test
- EN55022 (CISPR11): conducted and radiated emissions
- EN61000-4-2 Class B Level 4 ESD immunity test
- EN61000-4-3 (ENV50140) radiated RF, electromagnetic field immunity test
- EN61000-4-4 electrical fast transient/burst immunity test
- EN61000-4-5 IEEE C62.41: surge immunity test
- EN61000-4-6 (ENV50141) conducted immunity test
- EN61000-4-11 voltage dips and interruption immunity
- FCC Part 15 conducted/radiated emissions (Class A)
- CISPR 11 Conducted/radiated emissions (Class A)
- IEC 1000-2 electrostatic discharge test
- IEC 1000-3 radiated susceptibility test
- IEC 1000-4 fast transient tests
- IEC 1000-5 surge withstand tests
- NEMA® ICS 109.21 impulse withstand test
- CSA® conformance C22.2 No. 178-1978 (reaffirmed 1992)
- UL 869A reference standard for service equipment
- UL 50/508 enclosures
- NEMA ICS 1 general standards for industrial control system
- NEMA ICS 2 standards for industrial control devices, controllers, and assemblies
- NEMA ICS 6 enclosures for industrial controls and systems
- NEMA ICS 10-1993 AC automatic transfer switches
- ANSI C33.76 enclosures
- NEC® 517, 700, 701, and 702 National Electrical Code
- NFPA® 70 National Fire Protection Agency
- NFPA 99 health care facilities
- NFPA 101 life safety code
- NFPA 110 emergency and standby power systems
- EGSA 100S standard for transfer switches
- CSA C22.2 No. 178-1978 Canadian Standards Association

Open Transition Contactor-based Transfer Switch 40-3000A

Ampere Rating	Number of Poles	Height inches (mm)	Width inches (mm)	Depth inches (mm)	Standard Terminals*		
					Load Side, Normal and Standby Source	Neutral Connection	Shipping Weight Lbs (kg)
40-100 @ 120-480V	2	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)	(1) #14-2/0 kcmil	(1) #14-1/0 kcmil	156 (70.8)
	3	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)			156 (70.8)
	4	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)			156 (70.8)
40-100 @ 600V	2	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)	(1) #14-2/0 kcmil	(1) #14-1/0 kcmil	156 (70.8)
	3	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)			160 (72.6)
	4	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)			164 (74.4)
150-200 @ 120-480V	2	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)	(1) #6-300 kcmil	(3) 1/0-250 kcmil	156 (70.8)
	3	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)			160 (72.6)
	4	38.68 (982.5)	18.31 (465.1)	13.34 (338.8)			164 (74.4)
150-200 @ 600V	3	52.00 (1321)	19.81 (503)	16.75 (425)	(1) #6-250 kcmil	(3) 1/0-250 kcmil	250 (113.4)
	4	52.00 (1321)	19.81 (503)	16.75 (425)			260 (117.9)
225-400 @ 120-480V	2	52.00 (1321)	19.81 (503)	16.75 (425)	(2) 3/0-250 kcmil	(6) 250-500 kcmil	240 (108.9)
	3	52.00 (1321)	19.81 (503)	16.75 (425)			250 (113.4)
	4	52.00 (1321)	19.81 (503)	16.75 (425)			260 (117.9)
225-1200 @ 600V◊	3	79.41 (2017)	29.19 (741.4)	22.46 (570.5)	(4) 1/0-750 kcmil	(12) 1/0-750 kcmil	650 (294.8)
	4	79.41 (2017)	29.19 (741.4)	22.46 (570.5)			650 (294.8)
600-1200 @ 120-480V	2	79.41 (2017)	25.25 (648.2)	22.46 (570.5)	(4) 1/0-750 kcmil	(12) 1/0-750 kcmil	590 (267.6)
	3	79.41 (2017)	25.25 (648.2)	22.46 (570.5)			600 (272.2)
	4	79.41 (2017)	29.19 (741.4)	22.46 (570.5)			650 (294.8)
1600 @ 120-480V	2	90.00 (2288)	40.00 (1016)	26.73 (730)	Contact Factory		
	3	90.00 (2288)	40.00 (1016)	26.73 (730)			
	4	90.00 (2288)	40.00 (1016)	26.73 (730)			
2000 @ 120-480V	3	90.00 (2288)	40.00 (1016)	40.00 (1016)	Contact Factory		
	4	90.00 (2288)	40.00 (1016)	40.00 (1016)			
2600 @ 120-480V	3	90.00 (2288)	40.00 (1016)	40.00 (1016)	Contact Factory		
	4	90.00 (2288)	40.00 (1016)	40.00 (1016)			
3000 @ 120-480V	3	90.00 (2288)	40.00 (1016)	40.00 (1016)	Contact Factory		
	4	90.00 (2288)	40.00 (1016)	40.00 (1016)			

NEMA 1 dimensions and weights shown are approximate, subject to change without notice, and are not for construction use.

*Standard Terminals – ( ) indicate the quantity terminals (cables) per pole.

◊ For 3-position contactor

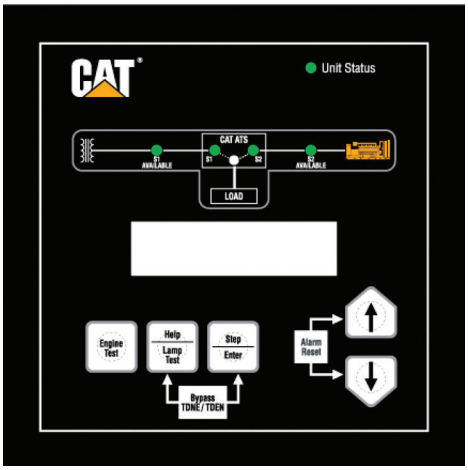


Image shown may not reflect actual package

Cat® ATC-300+ Controller

The ATC-300+ is a comprehensive and multifunctional microprocessor-based ATS controller. It is a compact and self-contained panel-mounted device that is designed to replace traditional relay and solid-state logic panels.

The ATC-300+ controller provides programmed flexibility to address the needs of any system. It operates from all system voltages between 120 to 600V, single-phase and three-phase at 50 or 60 Hz. In addition, a period of no control power is provided. The controller monitors the condition of the three-phase line-to-line voltage and frequency of Source 1 and Source 2 power sources and can be programmed for single-phase operation. The ATC-300+ Controller provides the intelligence to ensure that the ATS operates properly through a series of programmed sensing and timing functions.

Features

- Source 1 and source 2 sensing:
  - Undervoltage/underfrequency
  - Overvoltage/overfrequency
  - Three-phase rotation protection
  - Three-phase voltage unbalance/loss
- Pre-transfer signal contacts 1NO and 1NC
- Go to emergency (Source 2)
- Seven field-programmable time delays
- Auxiliary relay contacts:
  - Source 1 present 2NO and 2NC (optional)
  - Source 2 present 2NO and 2NC (optional)
- LCD-based display for programming, system diagnostic and help message display
- Mimic diagram with source available and connected LED indication
- Time-stamped history log
- System test pushbutton
- Programmable plant exercise (off, daily, 7, 14, and 28 day) interval selectable run time 0-600 minutes no load/load with fail-safe
- Integral overcurrent protection (optional)
- In-phase transition
- Stainless steel cover for controller (optional)
- Communications via RS-232 or Modbus through an integrated RS-485 port (optional)

ATC-300+ Controller Specifications

Description	Specification
Input Control Voltage	65 to 145 VAC 50/60 Hz
Voltage Measurements of	Source 1 V_{AB} Source 2 V_{AB} Source 1 V_{BC} Source 2 V_{BC} Source 1 V_{CA} Source 2 V_{CA}
Voltage Measurement Range	0 to 790 VAC RMS (50/60 Hz)
Voltage Measurement Accuracy	±2% of Nominal Input Voltage
Frequency Measurement for	Source 1 and Source 2
Frequency Measurement Range	40 Hz to 70 Hz
Frequency Measurement Accuracy	±0.1 Hz
Undervoltage Dropout Range	50 to 90% of Nominal Voltage
Undervoltage Pickup Range	(Dropout +2%) to 99% of Nominal System Voltage
Overvoltage Dropout Range	105 to 120% Nominal Voltage
Overfrequency Dropout Range Overfrequency Pickup Range	103 to 110% of the Nominal System Frequency 101% to (Dropout -1 Hz) of Nominal System Frequency
Underfrequency Dropout Range	90 to 97% of the Nominal System Frequency
Underfrequency Pickup Range	(Dropout +1 Hz) to 99% of Nominal System Frequency
Overfrequency Pickup Range	101% to (Dropout -1 Hz) of Nominal System Frequency
Operating Temperature Range	-20°C to +70°C (-4°F to +158°F)
Storage Temperature Range	-30°C to +85°C (-22°F to +185°F)
Operating Humidity	0 to 95% Relative Humidity (noncondensing)
Operating Environment	Resistant to Ammonia, Methane, Nitrogen, Hydrogen, and Hydrocarbons
Generator Start Relay	5A, 1/6 hp @ 250 VAC 5A @ 30 VDC with a 150W Maximum Load
K1, K2, Pre-transfer, Alarm Relays	10A, 1-3 hp @ 250 VAC 10A @ 30 VDC
Applicable Testing	UL Recognized Component Meets Intent of UL 991 1008 Meets IEC 1000-4-2, 1000-4-3, 1000-4-4, 1000-4-5, 1000-4-6, 10004-11 Meets CISPR 11, Class A Complies with CSA 22.2-178 Complies with FCC Part 15, Class A
Enclosure Compatability	NEMA 1, NEMA 3R, and NEMA 12 UV-resistant ATC-300+ Faceplate

ATC-300+ Controller Specifications (continued)

Parameter Setpoints	Description
TDNE	0 to 1800 seconds
TDEN	0 to 1800 seconds
TDEC	0 to 1800 seconds
TDES	0 to 120 seconds
TDN	0 to 120 seconds
TDEF	0 to 6 seconds
In-phase	Enabled or Disabled
In-phase Frequency Difference	0.0 to 3.0 Hz
Sync Time	1 to 60 minutes
Pre-transfer Signal Service	0 to 120 seconds
Plant Exerciser	Disabled, 7-, 14-, or 28-day intervals, 0-600 minutes, load or no load
Sensing	Three-phase or Single-phase
System Selection	Utility – utility or utility – generator
Engine Test Mode	Disabled, Load or No Load

ATC-300+ Controller Setpoints

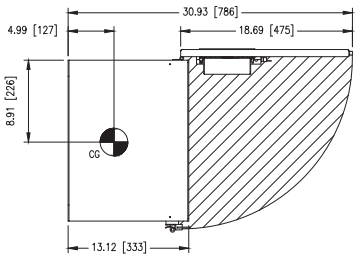
Setpoint	Units	Description	Range	Factory Default
New password	Four digits	Set new password	0000 to 9999	300
TDES	Minutes: seconds	Time delay engine start	0 to 120 seconds	0:03
TDNE	Minutes: seconds	Time delay normal to emergency	0 to 1800 seconds	0:00
TDEN	Minutes: seconds	Time delay emergency to normal	0 to 1800 seconds	5:00
TDEC	Minutes: seconds	Time delay engine cool off	0 to 1800 seconds	5:00
NOM FREQ	Hertz	Nominal frequency	50 or 60 Hz	As ordered
NOM VOLTS	Volts	Nominal voltage	120 to 600 volts	As ordered
S1 UV DROP	Volts	Source 1 undervoltage dropout range	78 to 97% of nominal system voltage	85%
S2 UV DROP	Volts	Source 2 undervoltage dropout range	78 to 97% of nominal system voltage	85%
S1 UV PICK	Volts	Source 1 undervoltage pickup range	(Dropout +2%) to 99% of nominal system voltage	90%
S2 UV PICK	Volts	Source 2 undervoltage pickup range	(Dropout +2%) to 99% of nominal system voltage	90%
S1 OV DROP	Volts	Source 1 overvoltage dropout range	105 to 110% of nominal system voltage	110%
S2 OV DROP	Volts	Source 2 overvoltage dropout range	105 to 110% of nominal system voltage	110%
S1 OV PICK	Volts	Source 1 overvoltage pickup range	103% to (dropout -2%) of nominal system voltage	105%
S2 OV PICK	Volts	Source 2 overvoltage pickup range	103% to (dropout -2%) of nominal system voltage	105%
S1 UF DROP	Hertz	Source 1 underfrequency dropout range	90 to 97% of nominal system voltage	90%
S2 UF DROP	Hertz	Source 2 underfrequency dropout range	90 to 97% of nominal system voltage	90%
S1 UF PICK	Hertz	Source 1 underfrequency pickup range	(Dropout +1 Hz) to 99% of nominal system voltage	90%
S2 UF PICK	Hertz	Source 2 underfrequency pickup range	(Dropout +1 Hz) to 99% of nominal system voltage	90%
S1 OF DROP	Hertz	Source 1 overfrequency dropout range	103 to 105% of nominal system frequency	105%

ATC-300+ Controller Setpoints (continued)

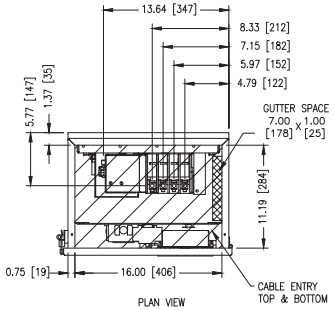
Setpoint	Units	Description	Range	Factory Default
S2 OF DROP	Hertz	Source 2 overfrequency dropout range	103 to 105% of nominal system frequency	105%
S1 OF PICK	Hertz	Source 1 overfrequency pickup range	103% to (dropout -1 Hz) of nominal system frequency	102%
S2 OF PICK	Hertz	Source 2 overfrequency pickup range	103% to (dropout -1 Hz) of nominal system frequency	102%
PLANT EXER	Days	Plant exerciser programming	Off, daily 7-, 14-, or 28-day	OFF
PE LOAD XFR		Plant exerciser load transfer	0 or 1 (1 = yes)	0
PE DAY	Days	Plant exerciser day of the week	1 Sun, 2 Mon, 3 Tues, 4 Wed, 5 Thu, 6 Fri, or 7 Sat	
PE HOUR	Hours	Plant exerciser hour	0 to 23	0
PE MINUTE	Minutes	Plant exerciser minute	0 to 59	0
TEST MODE		Test mode	0, 1, or 2 (2 = no load engine test 1 = load engine test, 2 = disabled)	0
TER	Hours: minutes	Engine run test time	0 to 600	5:00
TPRE	Minutes: seconds	Pre-transfer delay timer	0 sec to 120 sec	0:00
PHASES		Three-phase or single-phase	1 or 3	As ordered
VOLT UNBAL	Volts	Volts unbalanced	0 or 1 (1 = enabled)	0:00
UNBAL DROP %	Percent	Percent for unbalanced voltage dropout	5 to 20% of phase-to-phase voltage unbalances	20%
UNBAL PICK %	Percent	Percent for unbalanced voltage pickup	Dropout minus (UNBAL DROP % -2) to 3%	10%
UNBAL DELAY	Seconds	Unbalanced delay timer	10 to 30	0:20
TDEF	Seconds	Time delay emergency fail timer	0 to 6 sec	6
IP FREQ DIFF	Hertz	In-phase transition frequency difference	0.0 Hz to 3.0 Hz	1
SYNC TIME	Minutes	In-phase transition synchronization timer	1 min to 60 min	5
PHASE REV		Phase reversal	OFF, ABC, CBA	OFF

ATC-300+ Controller Setpoints (continued)

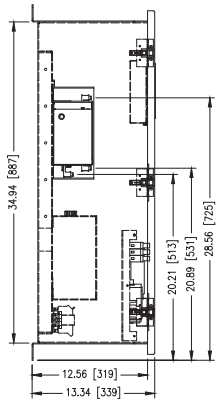
Setpoint	Units	Description	Range	Factory Default
DST ADJUST		Daylight savings	0 or 1 (1 = enabled)	1
LANGUAGE		Selected language	English French, or Spanish	English
CHANGE TIME/DATE?	Hours Minutes Weekday Month Day Year	Set time and date Set hour Set minute Set weekday Set month Set day Set year	0 to 23 0 to 59 Sun, Mon, Tues Wed, Thu, Fri, or Sat Jan or 01 1 to 31 Current year	Eastern Standard Time Eastern Standard Time Eastern Standard Time Eastern Standard Time Eastern Standard Time Eastern Standard Time
RESET SYSTEM COUNTERS?			Yes or no	No
RESET ALL?		Resets all system counters	Yes or no	No
RESET ENGINE RUN?	Hours	Resets ENGINE RUN counter	0 to 9999	XXXX
RESET S1 CONN	Hours	Resets SI CONN counter	0 to 9999	XXXX
RESET S2 CONN	Hours	Resets S2 CONN counter	0 to 9999	XXXX
RESET S1 AVAIL	Hours	Resets SI AVAIL counter	0 to 9999	XXXX
RESET S2 AVAIL	Hours	Resets S2 AVAIL counter	0 to 9999	XXXX
RESET LOAD ENERG	Hours	Resets LOAD ENERG counter	0 to 9999	XXXX
RESET TRANSFERS	Hours	Resets TRANSFERS counter	0 to 9999	XXXX
SAVE SETPOINTS		Save changed setpoints	Yes or no	Yes



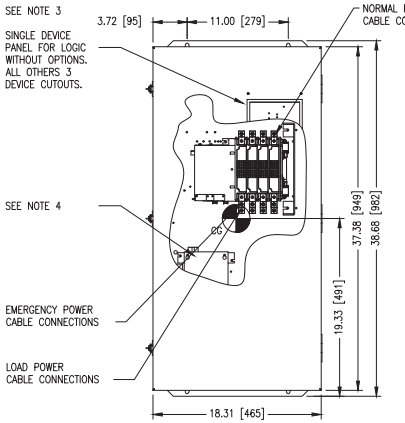
TOP VIEW



PLAN VIEW



SIDE VIEW (WITH LEFT SIDE REMOVED)



FRONT VIEW

ATC3C2X40100BSU

AUTOMATIC OPEN TRANSFER CONTACTOR SWITCH
ATC-300+ CONTROL, 2 POSITION CONTACTOR
FIXED MOUNTED
4 POLE, 100 AMPS
208/120V 60HZ, 3 PHASE, 4 WIRE
TYPE-1 ENCLOSURE, UL 1008 LISTED

FEATURES INCLUDED:

1A	TIME DELAY NORMAL TO EMERGENCY ADJ 0-1800 sec
2A	TIME DELAY ENGINE START ADJ 0-120 sec
3A	TIME DELAY EMERGENCY TO NORMAL ADJ 0-1800 sec
4A	TIME DELAY ENGINE COOL-OFF ADJ 0-1800 sec
5H	EMERGENCY (S2) SENSING PHASE REVERSAL
5J	EMERGENCY (S2) SENSING ALL PHASE UNDERVOLTAGE/UNDER FREQ
5K	EMERGENCY (S2) SENSING ALL PHASE OVERVOLTAGE/OVER FREQ
5L	EMERGENCY (S2) SENSING ALL PHASE VOLTAGE UNBALANCE
6B	ENGINE TEST PUSHBUTTON
7A	TIME DELAY ENGINE FAIL ADJ 0-6 sec
8C	BYPASS TIME DELAY EMERGENCY TO NORMAL
8D	BYPASS TIME DELAY NORMAL TO EMERGENCY
12C	NORMAL (S1) CONNECTED INDICATION
12D	EMERGENCY (S2) CONNECTED INDICATION
12G	NORMAL (S1) PRESENT INDICATION
12H	EMERGENCY (S2) PRESENT INDICATION
14L	AUX RELAY CONTACTS NORMAL (S1) PRESENT 2 FORM C
14M	AUX RELAY CONTACTS EMERGENCY (S2) PRESENT 2 FORM C
15E	POSITION INDICATION CONTACT NORMAL (S1) 1 FORM C
15F	POSITION INDICATION CONTACT EMERGENCY (S2) 1 FORM C
22	GROUND BAR
23K	PLANT EXERCISER 7/14/28 DAY LOAD/NO LOAD 0-600 min
26D	GO TO EMERGENCY (S2) INPUT
26H	NORMAL (S1) SENSING PHASE REVERSAL
26J	NORMAL (S1) SENSING ALL PHASE UNDERVOLTAGE/UNDER FREQ
26K	NORMAL (S1) SENSING ALL PHASE OVERVOLTAGE/OVER FREQ
26L	NORMAL (S1) SENSING ALL PHASE VOLTAGE UNBALANCE
32F	IN-PHASE TRANSITION
35A	PRE-TRANSFER SIGNAL CONTACTS 1 FORM C
42	IBC/CBC SEISMIC QUALIFIED
48F	COMMUNICATIONS MODBUS

REQUIRED FOR SEISMIC, RECOMMENDED FOR ALL APPLICATIONS:
USE 4, 1/2-13 UNC GRADE 5 OR BETTER HEX HEAD BOLTS AND WASHERS. THESE BOLTS ARE TO BE TORQUED TO 75 FT. LBS. (102 NM).

TERMINALS:
NORMAL: (1) #14-2/0 CU/AL PER POLE
EMERGENCY: (1) #14-2/0 CU/AL PER POLE
LOAD: (1) #14-2/0 CU/AL PER POLE
NEUTRAL: Switched Neutral

NOTES:
1 APPROXIMATE SHIPPING WEIGHT = 156 LBS [71 KG]
2 DIMENSIONS SHOWN IN INCHES [MILLIMETERS]
3 CONTROLS PROVIDED BASED ON CUSTOMER ORDER INFORMATION.
4 TRANSFORMER NOT INCLUDED
5 FOR SWITCHED NEUTRAL APPLICATIONS CONNECT TO TERMINALS MARKED 'NN', 'EN', AND 'TN'. NEUTRAL ASSEMBLY IS NOT PROVIDED.

CG CENTER OF GRAVITY

DFTR	Michael J Harper
DATE	3/3/2022
APPD	
DATE	
PRODUCT CODE	AT
S.O.	DCAK0303X2K3
DESIGNATION	
CAGE CODE	88725
REVISION	1
TITLE	AUTOMATIC OPEN TRANSFER | CONTACTOR SWITCH 208V 2 POSITION | 40-100 AMP | ATC-300+ CONTROLLER
TYPE	ATC3C2X40100BSU
	OUTLINE
G.O.	–
DWG	— 01
SHEET	1 OF 4

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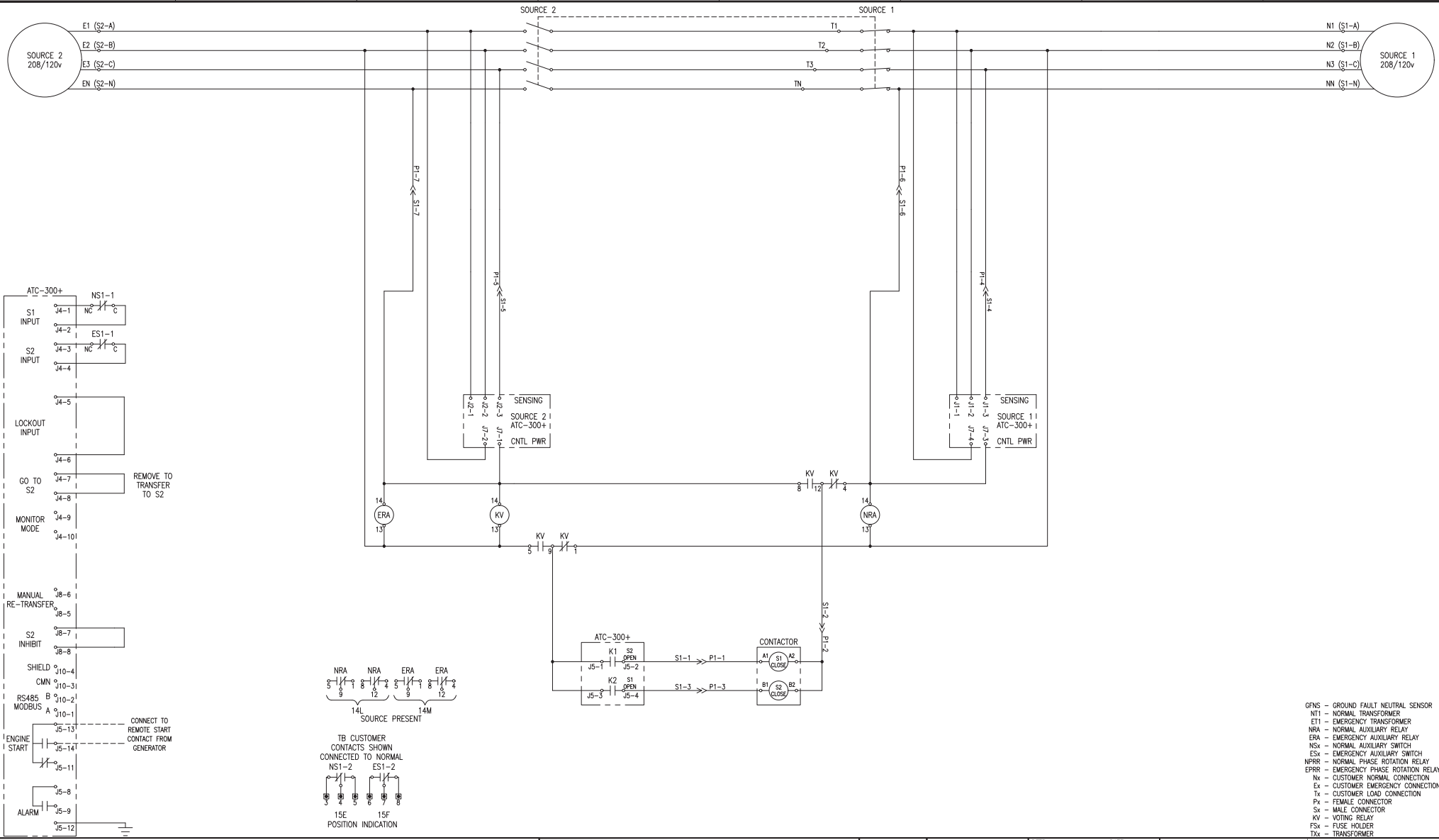

GFNS – GROUND FAULT NEUTRAL SENSOR
NT1 – NORMAL TRANSFORMER
ET1 – EMERGENCY TRANSFORMER
NRA – NORMAL AUXILIARY RELAY
ERA – EMERGENCY AUXILIARY RELAY
NSx – NORMAL AUXILIARY SWITCH
ESx – EMERGENCY AUXILIARY SWITCH
NPRR – NORMAL PHASE ROTATION RELAY
EPRR – EMERGENCY PHASE ROTATION RELAY
Nx – CUSTOMER NORMAL CONNECTION
Ex – CUSTOMER EMERGENCY CONNECTION
Tx – CUSTOMER LOAD CONNECTION
Px – FEMALE CONNECTOR
Sx – MALE CONNECTOR
KV – VOTING RELAY
FSx – FUSE HOLDER
TXx – TRANSFORMER

DFTR	Michael J Harper
DATE	3/3/2022
APPD	
DATE	
TITLE	AUTOMATIC OPEN TRANSFER | CONTACTOR SWITCH 208V 2 POSITION | 40-100 AMP | ATC-300+ CONTROLLER
PRODUCT CODE	AT
S.O.	DCAK0303X2K3
TYPE	ATC3C2X40100BSU
SCHEMATIC	
DESIGNATION	
CAGE CODE	88725
REVISION	1
G.O.	–
DWG	S1
SHEET	2 OF 4

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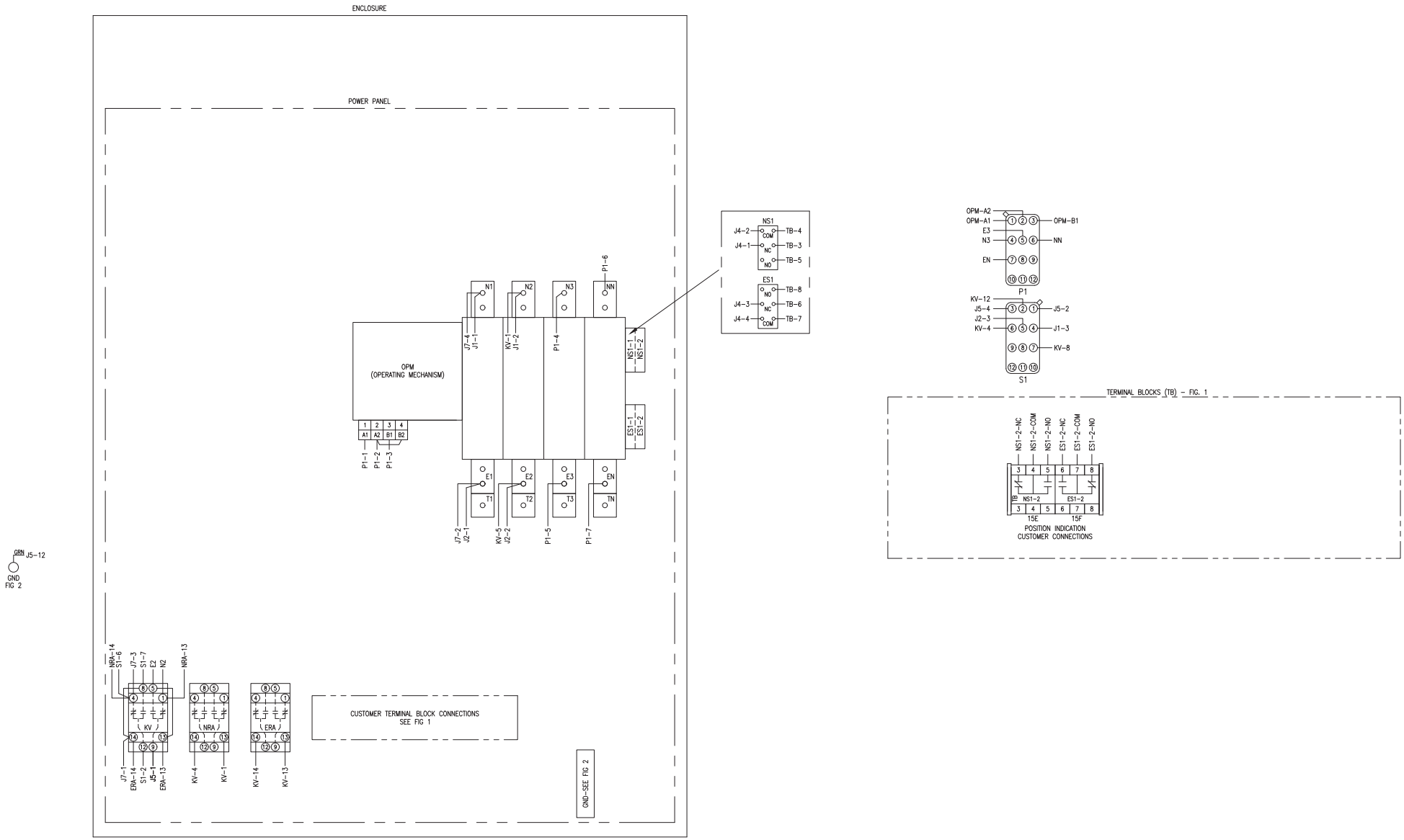

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			APPD	DATE	TITLE AUTOMATIC OPEN TRANSFER | CONTACTOR SWITCH 208V 2 POSITION | 40–100 AMP | ATC–300+ CONTROLLER	
			PRODUCT CODE AT	S.O. DCAK0303X2K3	TYPE ATC3C2X40100BSU	DIAGRAM
	DESIGNATION		CAGE CODE 88725	REVISION 1	G.O. –	DWG VV1 / SHEET 3 OF 4

COEFtBL_R7

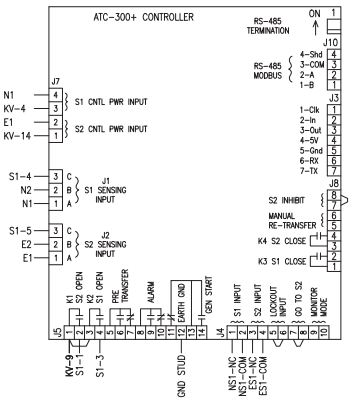
HINGE SIDE

ENCLOSURE DOOR (REAR VIEW)

FIG 1

**REFER TO ENCLOSURE DOOR REAR VIEW FOR DEVICE PLACEMENT

**FIG 1



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				APPD DATE	TITLE AUTOMATIC OPEN TRANSFER | CONTACTOR SWITCH 208V 2 POSITION | 40-100 AMP | ATC-300+ CONTROLLER	
	DESIGNATION		CAGE CODE 88725	PRODUCT CODE AT / S.O. DCAK0303X2K3	TYPE ATC3C2X40100BSU	DIAGRAM
				REVISION 1	G.O. –	DWG W2 / SHEET 4 OF 4

COEFtBL_R7

NC POWER SYSTEMS

SECTION 6

SHIPPED LOOSE ITEMS

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Product data sheet
Characteristics

9001KYK117
CONTROL STATION + OPERATORS

Product availability : Stock - Normally stocked in distribution facility

Main

Range of product	Harmony 9001K
Product or component type	Complete control station
Device short name	KY 9001KY
Provided equipment	Contact block Legend plate
Contact block name	KA1

Complementary

Enclosure/Cubicle description	Surface mounting
Enclosure material	Die cast zinc alloy Red
Type of installation	Indoor/outdoor
Control station composition	1 push-button 1 NO + 1 NC STOP-BREAK GLASS
Connections - terminals	Screw-clamp terminals
[Ie] rated operational current AC	10 A

Environment

NEMA degree of protection	NEMA 3/4/13

Ordering and shipping details

Category	21426 - 9001 K (NOT KA,KM,KX)
Discount Schedule	CS1
GTIN	00785901039846
Package weight(Lbs)	3.25 lb(US) (1.47 kg)
Returnability	Yes
Country of origin	MX

* Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Offer Sustainability

Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: Nickel compounds, which is known to the State of California to cause cancer, and Di-isodecyl phthalate (DIDP), which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACh Regulation	REACh Declaration
REACh free of SVHC	Yes
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Toxic heavy metal free	Yes
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS declaration
Environmental Disclosure	Product Environmental Profile

Contractual warranty

Warranty	18 months

APPENDIX

SITE PHOTOS

Figure 1: FRONT OF ENCLOSURE - EAST

Figure 2: FRONT OF ENCLOSURE - WEST

Figure 3:NORTHWEST OF ENCLOSURE

Figure 4:WEST OF ENCLOSURE

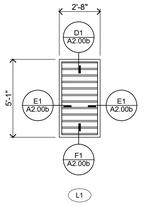
Figure 5:NORTH OF ENCLOSURE

Figure 6:SIDE OF ENCLOSURE

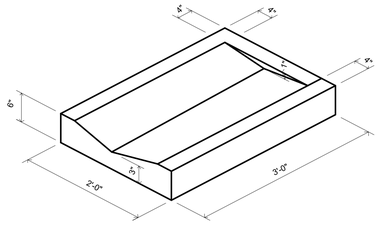
Figure 7:INSIDE OF ENCLOSURE

Figure 8:INSIDE OF ENCLOSURE

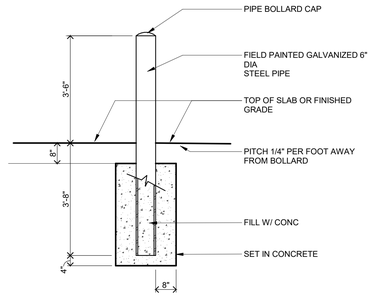
MN



B1 LOUVER TYPES
1/4" = 1'-0"



B2 CONCRETE SPLASHBLOCK
1" = 1'-0"



B4 BOLLARD DETAIL
1/2" = 1'-0"

DEMOLITION GENERAL NOTES

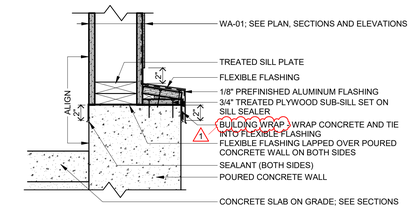
1. DEMOLITION NOTES AND PLANS ARE PROVIDED AS A GUIDE ONLY. CONTRACTOR TO VERIFY EXISTING CONDITIONS AND EXAMINE DRAWINGS AND DETAILS TO DETERMINE EXTENT AND LIMITS OF DEMOLITION REQUIRED TO ACCOMMODATE NEW CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL ASPECTS OF DEMOLITION. CONTRACTOR TO REVIEW ALL DRAWINGS FOR ADDITIONAL DETAILS AND CONSTRUCTION SEQUENCING NOTES. MECHANICAL AND ELECTRICAL DEMOLITIONS ARE SHOWN ON MECHANICAL AND ELECTRICAL DRAWINGS.
3. REFER TO MECHANICAL AND ELECTRICAL FOR ADDITIONAL DEMOLITION NOTES.
4. CONTRACTOR TO COORDINATE DEMOLITION WITH DETAILS AND STRUCTURAL DRAWINGS TO INSTALL NEW LINTELS OR STRUCTURAL COMPONENTS TO SUPPORT EXISTING STRUCTURE.
5. PROVIDE AND COORDINATE ALL DEMOLITION AND RECONSTRUCTION WITH NEW WORK PLAN DIMENSIONS AND INSTALLATION OF NEW MATERIALS AND FINISHES, AS REQUIRED, WHETHER INDICATED ON DRAWINGS OR NOT.
6. PROVIDE SMOOTH AND CLEAN SUBSTRATE TO ALL AREAS RECEIVING NEW FINISHES. COORDINATE WORK WITH PLANS AND THE ROOM FINISH SCHEDULE.
7. ALL RELATED WOOD BLOCKING SUPPORT STRUCTURE, HARDWARE CONNECTION DEVICES, ADHESIVES, AND/OR MASTIC SHALL BE REMOVED FROM SURFACES AT ITEMS NOTED FOR REMOVAL. PROVIDE SURFACES ACCEPTABLE FOR PATCHING AND/OR NEW WORK.
8. DEMOLITION NOTES WITHOUT ARROWS INDICATE THAT THE NOTE APPLIES TO THE ENTIRE ROOM.

DEMOLITION PLAN KEY NOTES:

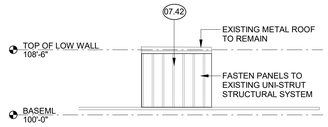
1. PROTECT POWERED SIGN DURING CONSTRUCTION.
2. REMOVE ROCKS TO EXTENTS SHOWN, SALVAGE FOR REINSTALLATION.
3. EXISTING LIFT STATION TO REMAIN.

DEMOLITION LEGEND

- WALL TO REMAIN
- WALL TO BE REMOVED
- DOOR TO REMAIN
- DOOR, FRAME, AND HARDWARE TO BE REMOVED UNLESS NOTED OTHERWISE
- DESIGNATED ITEM TO REMAIN
- DESIGNATED ITEM TO BE REMOVED

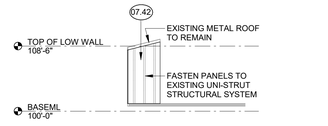


C1 FLASHING AT BASE OF WALL
1 1/2" = 1'-0"

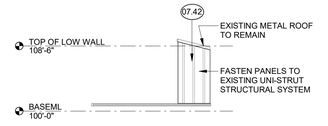


C3a LIFT STATION CONTROL ENCLOSURE - NE ELEVATION
1/8" = 1'-0"

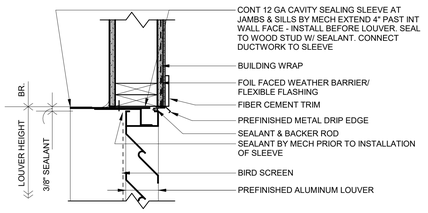
MATERIALS KEY	
KEY	MATERIAL
03.01	CONCRETE
05.07	MISC METAL
07.02	PREFINISHED SHEET METAL FLASHING
07.04	PREFINISHED SHEET METAL GUTTER
07.05	ASPHALT SHINGLES
07.09	PREFINISHED RAINSCREEN PANEL
07.37	PREFINISHED SHEET METAL DOWNSPOUT
07.41	FIBER CEMENT FACSIA
07.42	FIBER CEMENT SIDING
07.43	FIBER CEMENT TRIM
08.59	PREFINISHED METAL LOUVER
10.17	GALVANIZED FENCE



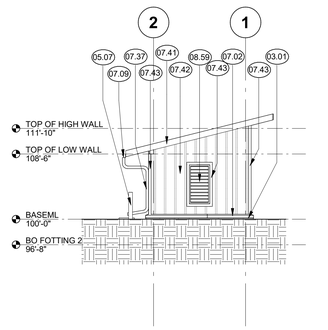
C3 LIFT STATION CONTROL ENCLOSURE - NW ELEVATION
1/8" = 1'-0"



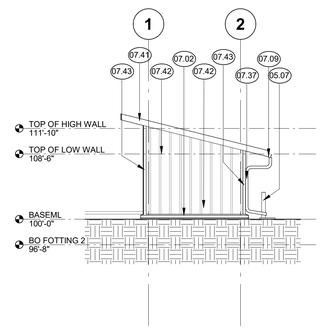
C5a LIFT STATION CONTROL ENCLOSURE - SE ELEVATION
1/8" = 1'-0"



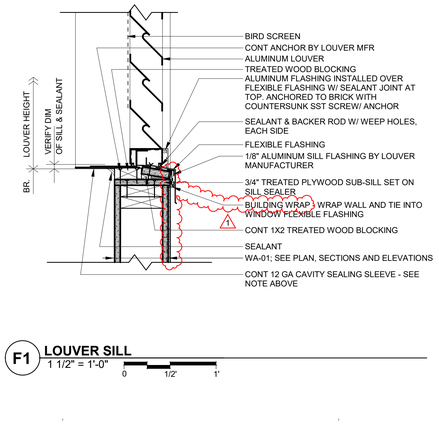
D1 LOUVER HEAD
1 1/2" = 1'-0"



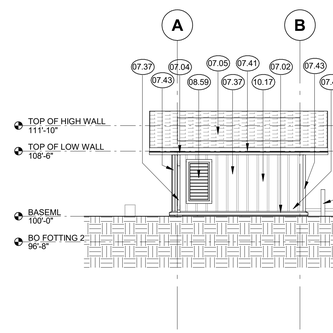
E3 GENERATOR - SOUTHEAST ELEVATION
1/8" = 1'-0"



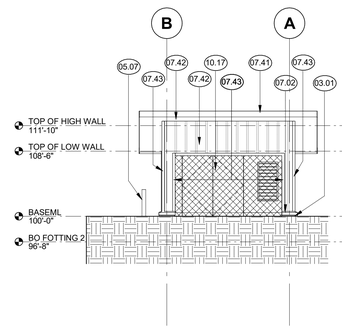
E5 GENERATOR - NORTHWEST ELEVATION
1/8" = 1'-0"



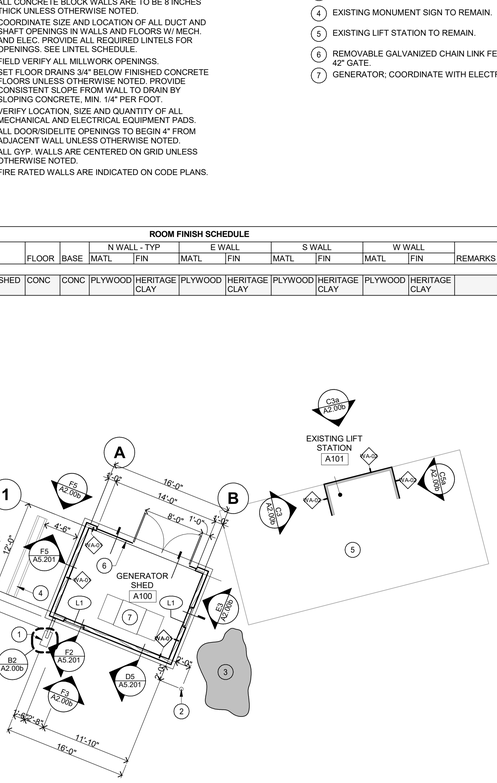
E1 LOUVER JAMB
1 1/2" = 1'-0"



F3 GENERATOR - SOUTHWEST ELEVATION
1/8" = 1'-0"



F5 GENERATOR - NORTHEAST ELEVATION
1/8" = 1'-0"



F6 GENERATOR FLOOR PLAN
1/8" = 1'-0"

PLAN GENERAL NOTES

1. ALL PLAN DIMENSIONS ARE NOMINAL TO FACE OF WALL. WALL THICKNESSES ARE SHOWN NOMINAL, SEE WALL TYPES FOR ACTUAL THICKNESS.
2. ALL GYP. WALLS ARE TO BE 5 INCHES THICK UNLESS OTHERWISE NOTED.
3. ALL CONCRETE BLOCK WALLS ARE TO BE 8 INCHES THICK UNLESS OTHERWISE NOTED.
4. COORDINATE SIZE AND LOCATION OF ALL DUCT AND SHAFT OPENINGS IN WALLS AND FLOORS W/ MECH. AND ELEC. PROVIDE ALL REQUIRED LINTELS FOR OPENINGS. SEE LINTEL SCHEDULE.
5. FIELD VERIFY ALL MILLWORK OPENINGS.
6. SET FLOOR DRAINS 3/4" BELOW FINISHED CONCRETE FLOORS UNLESS OTHERWISE NOTED. PROVIDE CONSISTENT SLOPE FROM WALL TO DRAIN BY SLOPING CONCRETE, MIN. 1/4" PER FOOT.
7. VERIFY LOCATION, SIZE AND QUANTITY OF ALL MECHANICAL AND ELECTRICAL EQUIPMENT PADS.
8. ALL DOOR/SIDELITE OPENINGS TO BEGIN 4" FROM ADJACENT WALL UNLESS OTHERWISE NOTED.
9. ALL GYP. WALLS ARE CENTERED ON GRID UNLESS OTHERWISE NOTED.
10. FIRE RATED WALLS ARE INDICATED ON CODE PLANS.

FLOOR PLAN KEY NOTES:

1. SPLASH BLOCK - SEE DETAIL B2/A2.00b.
2. BOLLARD - SEE DETAIL B4/A2.00b.
3. RELOCATED ROCKS.
4. EXISTING MONUMENT SIGN TO REMAIN.
5. EXISTING LIFT STATION TO REMAIN.
6. REMOVABLE GALVANIZED CHAIN LINK FENCE WITH 42" GATE.
7. GENERATOR; COORDINATE WITH ELECTRICAL

ROOM FINISH SCHEDULE													
				N WALL - TYP		E WALL		S WALL		W WALL			
ROOM NO	ROOM NAME	FLOOR	BASE	MATL	FIN	MATL	FIN	MATL	FIN	MATL	FIN	MATL	FIN	REMARKS
A100	GENERATOR SHED	CONC	CONC	PLYWOOD	HERITAGE CLAY	PLYWOOD	HERITAGE CLAY	PLYWOOD	HERITAGE CLAY	PLYWOOD	HERITAGE CLAY		

LIFT STATION GENERATOR ENCLOSURE

Wood St.,
Wrangell, AK 99929

City of Wrangell
Wood St, Wrangell, AK 99929

WOLD ARCHITECTS AND ENGINEERS
332 Minnesota Street, Suite W2000
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R&M ENGINEERING-KETCHIKAN, INC.
ENGINEERS GEOLOGISTS SURVEYORS

STATE OF ALASKA
49TH
JOSH RIPPLINGER
No. A129594
REGISTERED PROFESSIONAL ARCHITECT

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed
ARCHITECT
under the laws of the State of MINNESOTA
Josh Ripplinger
License Number: 46143 Date: 06/30/2022

Revisions		
Description	Date	Num.
Addendum 1	03/10/2022	1

Comm: 216054
Date: 01/25/2022
Drawn: MS
Check: SM | JR
North

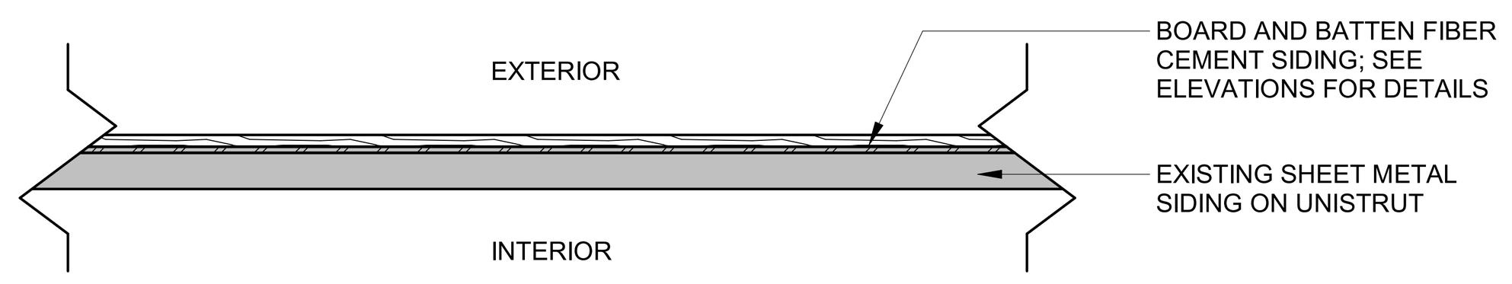
MAIN LEVEL DEMOLITION PLAN, FLOOR PLAN & ELEVATIONS

Scale: As indicated

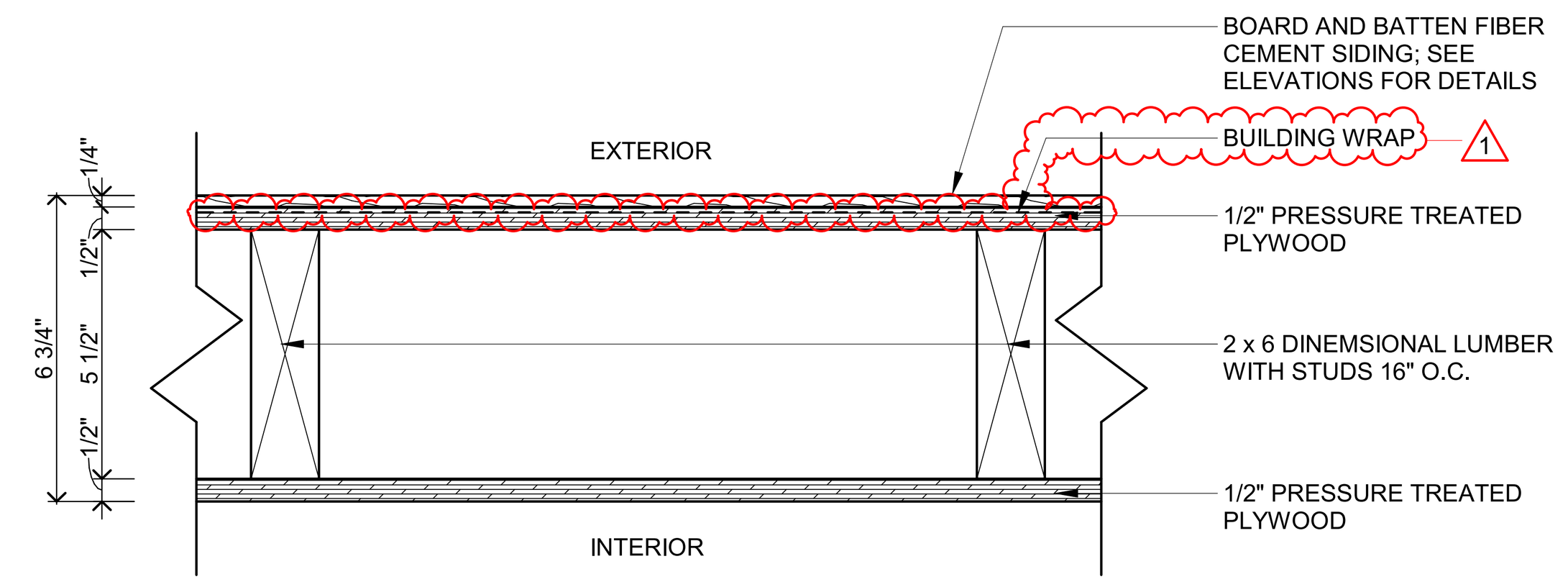
A2.00b

A

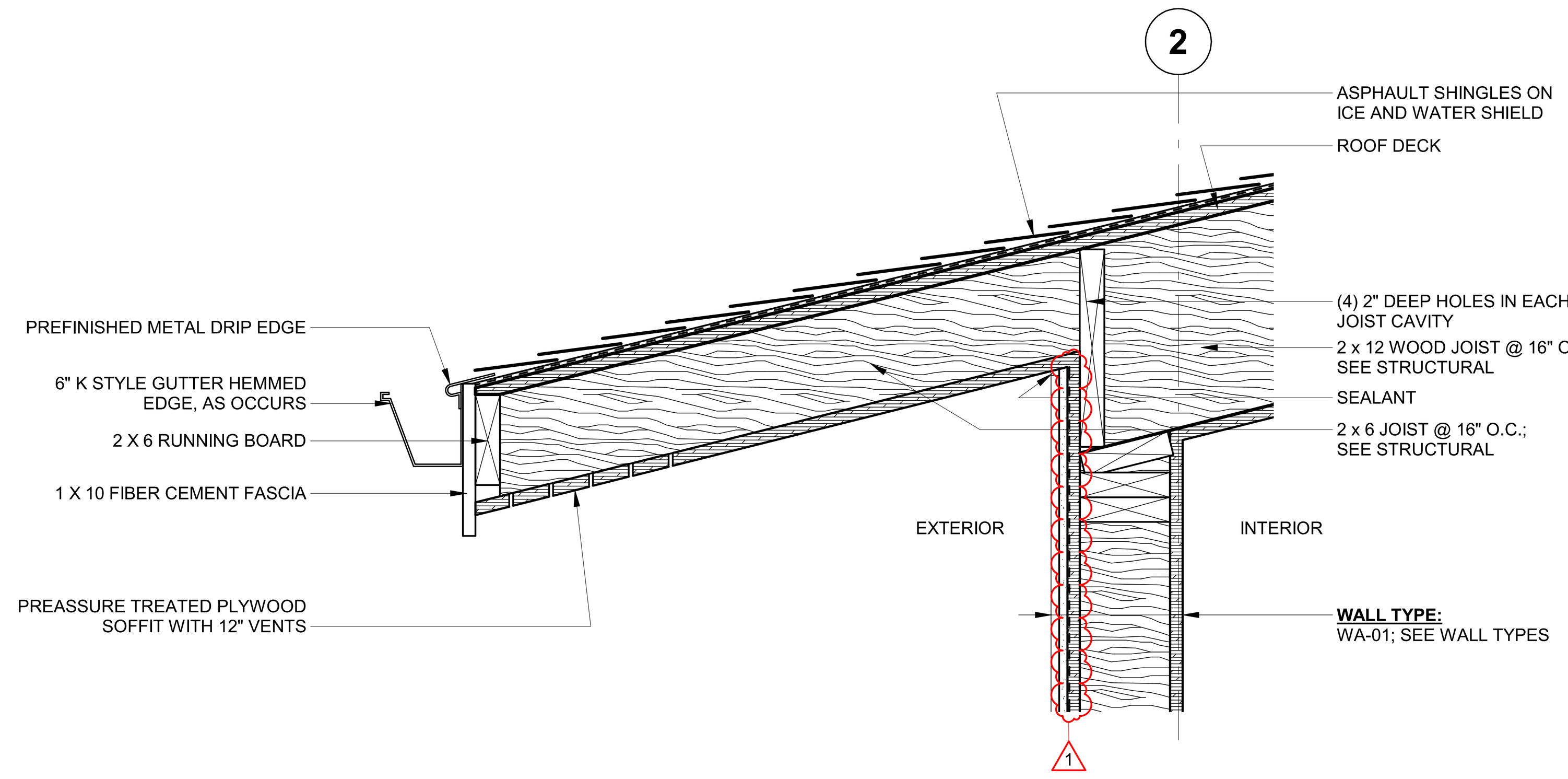
MN



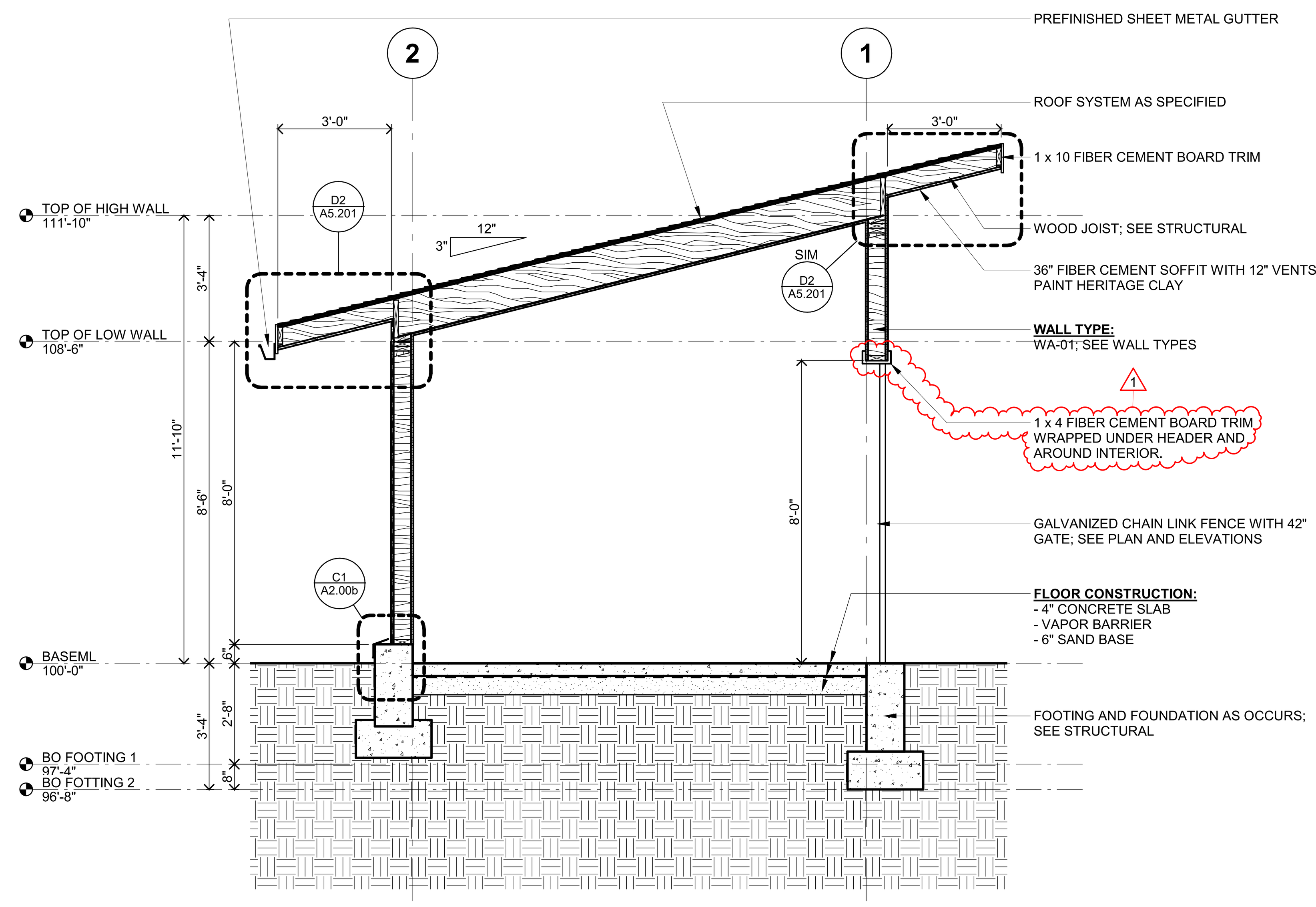
A2 **WA-02 - PLAN DETAIL (FIBER CEMENT SIDING ON EXISTING METAL STRUCTURE)**
3" = 1'-0"



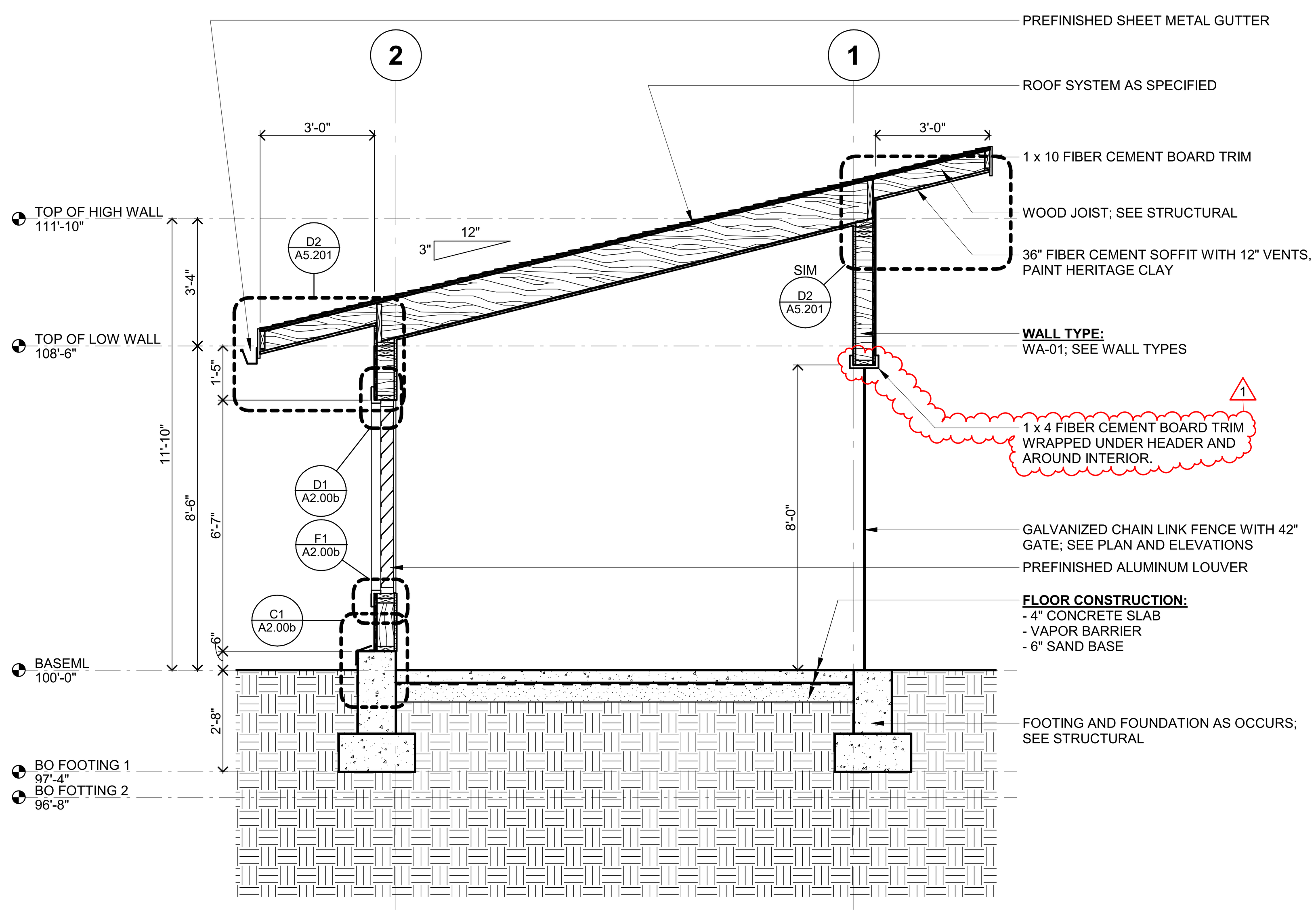
B2 **WA-01 - PLAN DETAIL (FIBER CEMENT SIDING ON WOOD STUD)**
3" = 1'-0"



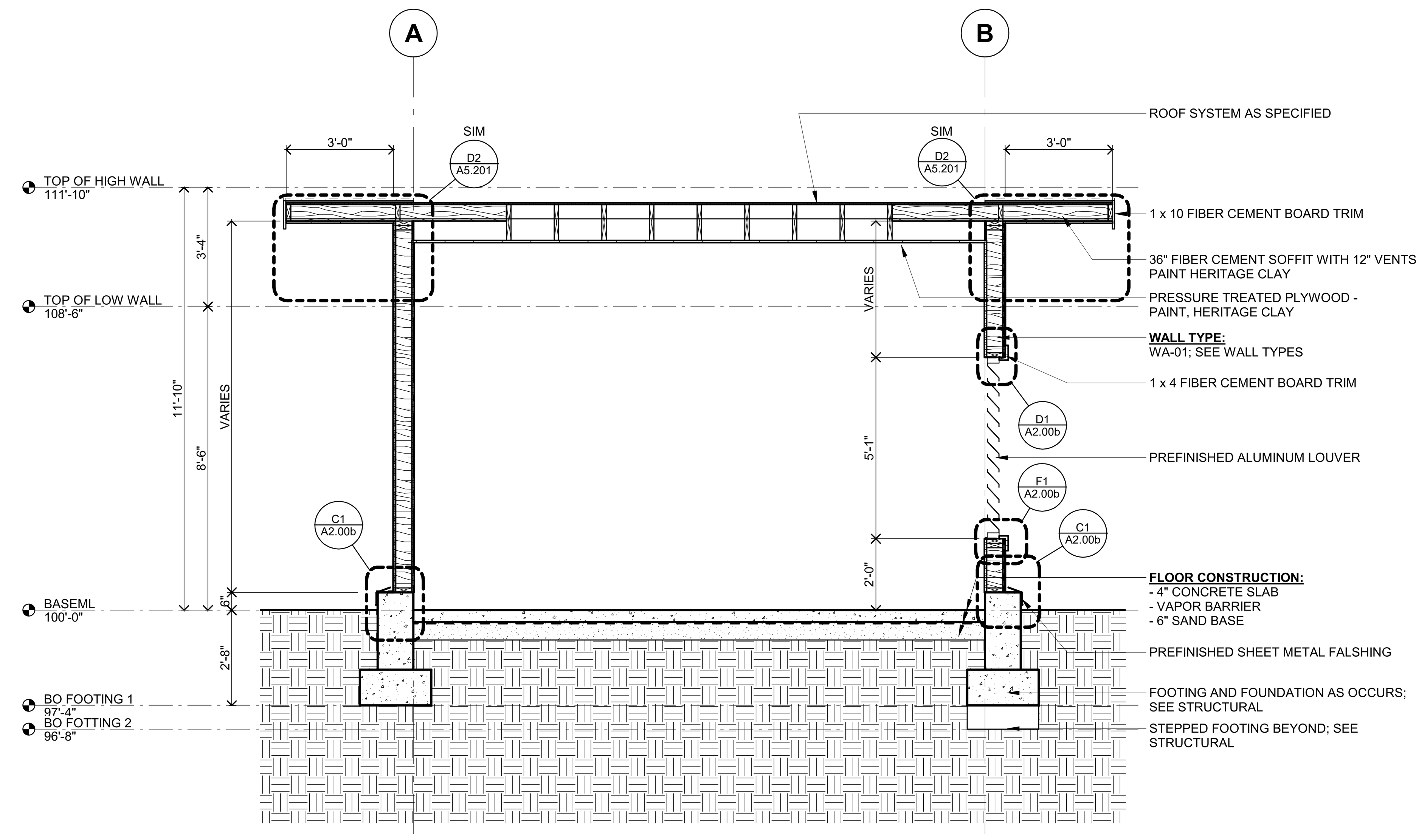
D2 **ROOF SOFFIT DETAIL**
1 1/2" = 1'-0"



D5 **SECTION AT STEPPED FOOTING**
3/8" = 1'-0"



F2 **SECTION AT LOUVER AND CHAIN LINK FENCE**
3/8" = 1'-0"



F5 **SECTION AT LOUVER**
3/8" = 1'-0"

A

LIFT STATION GENERATOR ENCLOSURE
Wood St.,
Wrangell, AK 99929

City of Wrangell
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Wold

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STATE OF ALASKA 49TH JOSH RIPPLINGER No. A129594 REGISTERED PROFESSIONAL ARCHITECT

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed ARCHITECT under the laws of the State of MINNESOTA
Josh Ripplinger
License Number: 46143 Date: 06/30/2022

Revisions

Description	Date	Num
Addendum 1	03/10/2022	1

Comm: 216054
Date: 01/25/2022
Drawn: MS
Check: SM | JR

WALL SECTIONS, TYPES AND DETAILS

Scale: As indicated

A5.201

GENERAL NOTES

THE FOLLOWING NOTES APPLY EXCEPT WHERE SHOWN OTHERWISE

CODE: INTERNATIONAL BUILDING CODE IBC (2018)

ROOF SNOW LOADS:
GROUND SNOW LOAD, Pg = 60PSF
ROOF SNOW LOAD, Pf = 60PSF
SNOW EXPOSURE FACTOR, Ce = 0.8
SNOW LOAD IMPORTANCE FACTOR, Is = 1.0
THERMAL FACTOR, Ct = 1.2

WIND LOADS:
ULTIMATE WIND SPEED, V3s/Vult = 139MPH
RISK CATEGORY: II
WIND EXPOSURE: 'C'
Kzt = 1.0
INTERNAL PRESSURE COEFFICIENT = +/- 0.55 (PARTIALLY ENCLOSED BUILDING)
DESIGN BASE SHEAR, V = 7 KIPS (SD)

EARTHQUAKE LOADS:
SEISMIC RISK OCCUPANCY CATEGORY: II
SEISMIC IMPORTANCE FACTOR, Ie = 1.0
MAPPED ACCELERATIONS, Ss = 0.249 S1 = 0.254
SITE CLASS = D
DESIGN ACCELERATIONS, Sds = 0.265 Sd1 = 0.321
SEISMIC DESIGN CATEGORY: D
BASIC SEISMIC FORCE RESISTING SYSTEM: LIGHT-FRAME (WOOD) WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE
DESIGN BASE SHEAR, V = 0.5 KIPS (SD)
SEISMIC RESPONSE COEFFICIENT, Cs = 0.041
RESPONSE MODIFICATION FACTOR, R = 6.5
ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE PROCEDURE

SHOP DRAWINGS
SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT, BY INDICATING WHICH MATERIAL IS INTENDED TO BE FURNISHED AND INSTALLED, AND BY DETAILING THE INTENDED FABRICATION AND INSTALLATION METHODS. IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS ARE DISCOVERED EITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND SHALL BE FOLLOWED. SUBMITTAL REVIEW IS FOR GENERAL CONFORMANCE ONLY; THIS REVIEW DOES NOT CHECK DIMENSIONS OR QUANTITIES.

FOUNDATIONS
MAXIMUM SOIL PRESSURE 2000 PSF. EXTERIOR FOOTINGS SHALL BEAR 2'-8" (MINIMUM) BELOW FINISH GRADE. FOOTING BASE PREPARATION REQUIRES OVER-EXCAVATION OF EXISTING GRADE BACKFILLED WITH ROCKS PER GEOTECH'S RECOMMENDATIONS. FOR ADDITIONAL INFORMATION REFER TO SOILS REPORT NO. 18271JN, BY PDC ENGINEERS, DATED SEPTEMBER 7, 2018.

CONCRETE
A. CONCRETE
ALL CAST-IN-PLACE CONCRETE SHALL BE WITH THE EXPOSURE CATEGORIES, WATER-CEMENT RATIOS, ENTRAINED AIR AND MINIMUM 28-DAY COMPRESSIVE STRENGTHS AS INDICATED IN THE CONCRETE SCHEDULE ON THIS SHEET.

ELEMENTS	EXPOSURE	CATEGORY		AIR	fc
FOUNDATION	F0	S0	C0		3000
FOUNDATION WALLS	F0	S0	C0		3000
FOUNDATION WALLS ABOVE GRADE	F1	S0	C1	5.5	3500
SLAB ON GRADE	F0	S0	C0		3000
SLAB ON GRADE EXPOSED TO WEATHER	F2	S0	C2	7	5000

CONCRETE MIX DESIGNS FOR ALL CONCRETE ELEMENTS SHALL COMPLY WITH SECTION 19.3 OF ACI318-14 BASED ON THE EXPOSURE CATEGORIES LISTED IN THE ABOVE TABLE. NO CALCIUM CHLORIDE SHALL BE USED IN ANY CONCRETE.

B. REINFORCING
ALL REINFORCING BARS SHALL BE NEW BILLET STEEL ASTM A615, GRADE 60 CONFIRMING TO ACI 318 SECTION 20.2.2.5. WELDABLE REINFORCING BARS SHALL CONFIRM TO ASTM A706.
EPOXY COATED BARS, WHERE INDICATED ON PLAN, SHALL CONFORM TO ASTM A775
ALL WELDED WIRE REINFORCEMENT (WWR) SHALL CONFORM TO ASTM A185.
EPOXY COATED WWR SHALL CONFORM TO ASTM A884, CLASS A.
ALL HEADED SHEAR STUD REINFORCEMENT SHALL CONFORM TO ASTM A1044.

ALL CONCRETE REINFORCEMENT SHALL BE DETAILED, FABRICATED, LABELED, SUPPORTED, SPACED IN FORMS, AND SECURED IN PLACE IN ACCORDANCE WITH THE PROCEDURES AND REQUIREMENTS OUTLINED IN THE LATEST EDITION OF ACI 318, AND THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", ACI 315.

THE CONTRACTOR SHALL SUBMIT CHECKED SHOP DRAWINGS SHOWING REINFORCING DETAILS, INCLUDING STEEL SIZES, SPACING, PLACEMENT AND SUPPORT DETAILS AND DOWELS AT EXPANSION JOINTS FOR REVIEW PRIOR TO FABRICATION.

ALL REINFORCING SPLICES SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITION OF ACI 318 AND THE SPLICE TABLE INCLUDED IN THE STRUCTURAL DOCUMENTS UNO. ALL WWR SHALL BE LAPPED TWO (2) FULL MESH PANELS AND TIED SECURELY.

WHERE REQUIRED, DOWELS SHALL MATCH THE SIZE AND SPACING OF MAIN REINFORCING, UNO.

ALL MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT PADS SHALL BE REINFORCED WITH AT LEAST ONE (1) LAYER OF 6X6-W4.0 X W4.0 WWR AT TOP CONTINUOUS, UNO. SEE HVAC, PLUMBING AND ELECTRICAL DRAWINGS FOR ADDITIONAL REINFORCING REQUIREMENTS FOR PADS.

BAR SUPPORTS IN CONTACT WITH EXPOSED SURFACES SHALL BE PLASTIC TIPPED.

IN NON-PRESTRESSED CAST-IN-PLACE CONCRETE, THE SPECIFIED CONCRETE COVER FOR REINFORCEMENT SHALL NOT BE LESS THAN THE FOLLOWING, UNLESS LARGER COVER IS NOTED ELSEWHERE.

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:
  3 IN.
- CONCRETE EXPOSED TO EARTH OR WEATHER:
  #6 THROUGH #18 BARS 2 IN.
  #5 BAR, W31, OR D31 WIRE AND SMALLER 1-1/2 IN.
- CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
  SLABS, WALLS, JOISTS:
  #14 AND #18 BARS 1-1/2 IN.
  #11 BAR AND SMALLER 3/4 IN.
  BEAMS, COLUMNS:
  REINFORCEMENT, TIES, STIRRUPS, SPIRALS 1-1/2 IN.

ALL STAINLESS STEEL REINFORCING SHALL BE AUSTENITIC TYPE 316 DEFORMED BARS CONFORMING TO THE STANDARDS OF ASTM A276 AND ASTM A955.

PROVIDE #4 HAIRPIN BARS WITH 12" LEGS AT 6" O.C. (MINIMUM) AT HEAD OF ALL OPENINGS WITH 2-#5 BARS EXTENDING 30" BEYOND OPENING AT HEAD. PROVIDE (2) #5 EXTRA BARS EXTENDING 30" (MINIMUM) BEYOND CORNERS AT TOP, BOTTOM, AND EACH SIDE OF OPENINGS. USE (2) #5 X 4' - 0" DIAGONALS AT EACH CORNER OF OPENINGS EXCEPT FOR 6" WALLS. USE (1) #5X4'0" DIAGONAL AT EACH CORNER IN 6" WALLS.

USE #4 RAISER BARS FOR ALL SLABS. WHERE SLAB STEEL IS PARALLEL TO A BEAM OR WALL PROVIDE #4 X 5' - 0" AT 12" O.C. IN TOP OF SLAB ACROSS BEAM OR WALL. WHERE SLAB IS ON ONE SIDE ONLY, TOP ELBOW BARS SHALL BE #4 X 3'- 0" AT 12" O.C. AT OPENINGS UNDER 18" SQUARE PROVIDE 2 BARS SAME SIZE AS MAIN STEEL EXTENDING 32 DIAMETERS PAST OPENING, AT EACH SIDE AND DIAGONALLY AT CORNERS.

C. CONSTRUCTION JOINTS
CONSTRUCTION JOINTS IN ALL WALLS, ELEVATED SLABS AND BEAMS SHALL NOT BE FURTHER APART THAN 60 FEET IN ANY DIRECTION.
ALL CONSTRUCTION JOINTS SHALL BE ROUGH TO A MAGNITUDE OF ¼" AND SHALL BE WIRE BRUSHED, CLEANED AND MOISTENED IMMEDIATELY PRIOR TO PLACING NEW CONCRETE.

PLACE ALL SLABS-ON-GRADE IN STRIP POURS OF 30 FEET MAXIMUM WIDTH WITH A MINIMUM OF 24 HOURS BETWEEN ADJACENT POURS. STRIP POURED SLABS SHALL HAVE SAW CUT CONTROL JOINTS SPACED AT 36 TIMES THE SLAB THICKNESS (15'-0" MAXIMUM) ON CENTER. SAW CUTTING SHOULD BE PERFORMED BEFORE THE CONCRETE STARTS TO COOL AFTER PEAK HEAT OF CEMENT HYDRATION, AND AS SOON AS THE CONCRETE HAS HARDENED ENOUGH TO SUPPORT EQUIPMENT WITHOUT DAMAGE AND NOT RAVEL THE CONCRETE DURING CUTTING. SAW CUTTING SHALL BE DONE WITHIN 12 HOURS OF CONCRETE PLACEMENT.

ALLOW A MINIMUM OF 24 HOURS BETWEEN PLACEMENT OF CONCRETE FOR COLUMNS, WALLS OR PIERS AND PLACEMENT OF CONCRETE ON THE ADJACENT FLOOR.

D. CURING AND SEALING
PROVIDE SPECIFIED CURING COMPOUND AND SEALER FOR THE TOP SURFACE OF ALL SLAB WORK, UNLESS NOTED OTHERWISE. VERIFY COMPATIBILITY OF SPECIFIED SEALERS AND/OR HARDENERS WITH ARCHITECTURAL TOPPINGS AND FINISHES.

E. TOLERANCES
ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 117, LATEST EDITION, "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS AND COMMENTARY", EXCEPT AS MODIFIED BY THESE DOCUMENTS.

SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR TYPE AND LOCATION OF ALL FLOOR FINISHES, FLOOR DEPRESSIONS, AND NON-STRUCTURAL CURBS.

SLABS SHALL MEET THE FLOOR FLATNESS (FF) AND FLOOR LEVELNESS (FL) TOLERANCES INDICATED IN SPECIFICATIONS. FINISHED FLOOR SLABS THAT DO NOT MEET THE SPECIFIED SURFACE TOLERANCES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR TO SUBMIT PROPOSED REPAIR PROCEDURES TO THE ARCHITECT/STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL PRIOR EXECUTION OF REPAIR WORK.

F. CONDUITS AND PIPES EMBEDDED IN CONCRETE
CONDUITS, PIPES, AND SLEEVES OF ANY MATERIAL NOT HARMFUL TO CONCRETE AND WITHIN THE LIMITATIONS OF SECTION 6.3 OF ACI 318 (LATEST EDITION) SHALL BE PERMITTED TO BE EMBEDDED IN CONCRETE, ONLY WITH PRIOR WRITTEN APPROVAL OF THE ARCHITECT/STRUCTURAL ENGINEER. THE CONTRACTOR SHALL SUBMIT DETAILED DIMENSIONED AND COORDINATED DRAWINGS OF PROPOSED EMBEDDED CONDUIT, PIPES, AND SLEEVES TO THE ARCHITECT PRIOR TO CONSTRUCTION.

CONDUITS AND PIPES OF ALUMINUM SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION OR ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

CONDUITS, PIPES, AND SLEEVES PASSING THROUGH A SLAB, WALL, OR BEAM SHALL NOT IMPAIR SIGNIFICANTLY THE STRENGTH OF THE CONSTRUCTION.

CONDUITS AND PIPES ARE NOT ALLOWED TO BE EMBEDDED WITHIN A COLUMN.

CONDUITS AND PIPES EMBEDDED WITHIN A SLAB, WALL, OR BEAM (OTHER THAN THOSE MERELY PASSING THROUGH) SHALL SATISFY THE FOLLOWING.
a. THEY SHALL NOT BE LARGER IN OUTSIDE DIAMETER THAN 1/3RD THE OVERALL THICKNESS OF THE SLAB, WALL, OR BEAM IN WHICH THEY ARE EMBEDDED;
b. THEY SHALL NOT BE SPACED CLOSER THAN 3 DIAMETERS OR WIDTHS;
c. THEY SHALL NOT SIGNIFICANTLY IMPAIR THE STRENGTH OF THE CONSTRUCTION.
PIPES AND FITTINGS SHALL BE DESIGNED TO RESIST EFFECTS OF THE MATERIAL, PRESSURE, AND TEMPERATURE TO WHICH THEY WILL BE SUBJECTED.

NO LIQUID, GAS, OR VAPOR, EXCEPT WATER NOT EXCEEDING 90 DEGREES FAHRENHEIT NOR 50 PSI PRESSURE, SHALL BE PLACED IN EMBEDDED PIPES UNTIL THE SURROUNDING CONCRETE HAS ATTAINED ITS FULL DESIGN STRENGTH.

IN SOLID SLABS, PIPING, UNLESS IT IS FOR RADIANT HEATING OR SNOW MELTING, SHALL BE PLACED BETWEEN THE TOP AND BOTTOM REINFORCEMENT.

CONCRETE COVER FOR PIPES, CONDUIT, AND THEIR FITTINGS SHALL NOT BE LESS THAN 1-1/2 INCH FOR CONCRETE EXPOSED TO EARTH OR WEATHER AND NOT LESS THAN 3/4 INCH FOR CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND.

ADDITIONAL REINFORCEMENT WITH AN AREA NOT LESS THAN 0.002 TIMES THE GROSS AREA OF THE CONCRETE SECTION AT A SPACING NOT EXCEEDING 12 INCHES SHALL BE PROVIDED PERPENDICULAR TO THE PIPING.

PIPING AND CONDUIT SHALL BE SO FABRICATED AND INSTALLED THAT CUTTING, BENDING, OR DISPLACEMENT OF REINFORCEMENT FROM ITS PROPER LOCATION WILL NOT BE REQUIRED.

G. GENERAL
THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE LOCATIONS OF ALL CONSTRUCTION JOINTS, CONTROL JOINTS, CURBS, SLAB DEPRESSIONS, SLEEVES, OPENINGS, ETC.

CONCRETE SLABS AND WALLS SHALL NOT BE SLEEVED OR BOXED-OUT OR HAVE THE REINFORCING INTERRUPTED, EXCEPT AS INDICATED ON THE STRUCTURAL DRAWINGS. ADDITIONAL SLEEVES OR BOX-OUTS MAY BE REQUIRED FOR ARCHITECTURAL, HVAC, ELECTRICAL, OR MECHANICAL ELEMENTS. A COORDINATED COMPOSITE DRAWING INDICATING ALL SLEEVES AND BOX-OUTS REQUIRED FOR THE WORK OF ALL DISCIPLINES SHALL BE SUBMITTED TO THE ARCHITECT/STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. A COMPOSITE DRAWING SHALL BE SUBMITTED FOR EACH SLAB AND/OR WALL AND THE SIZE AND DIMENSIONED LOCATION OF ALL SLEEVES, BOX-OUTS, CORES, ETC. SHALL BE INDICATED.

CONCRETE BEAMS SHALL NOT BE SLEEVED OR BOXED-OUT OR HAVE THE REINFORCING INTERRUPTED, EXCEPT AS INDICATED ON THE STRUCTURAL DRAWINGS.

MINIMUM SLAB-ON-GRADE THICKNESSES SHALL BE 5" FOR SIDEWALKS, 8" FOR AUTOMOBILE TRAFFIC AREAS, AND 10" FOR TRUCK TRAFFIC AREAS, UNO.

TIMBER:
STRUCTURAL TIMBER AND LUMBER TO BE STRESS GRADE HEM-FIR OR DOUGLAS FIR AS FOLLOWS:

USE	SPECIES	GRADE	FB
4 X BEAMS/ POST	DOUGLAS FIR	NO. 2	900 PSI
6 X BEAMS/POST AND LARGER	DOUGLAS FIR	NO. 1	1350 PSI
EXTERIOR & BEARING WALL STUDS	DOUGLAS FIR	NO. 2	900 PSI
SHEAR WALL STUDS, PLATES AND BLOCKING	DOUGLAS FIR	NO. 2	900 PSI
ROOF JOISTS, FLOOR JOISTS	DOUGLAS FIR	NO. 2	900 PSI

WOOD AND WOOD BASED MATERIALS USED IN CONTACT WITH SOIL, CONCRETE OR MASONRY, INSTALLED WITHIN 1' OF CONCRETE OR MASONRY, OR EXPOSED TO MOISTURE EITHER INTERIOR OR EXTERIOR, SHALL BE TREATED WITH AN APPROVED PRESERVATIVE PER THE "PRESERVATIVE TREATMENT" SECTION BELOW. SOLID BLOCKING OF NOT LESS THAN 2" NOMINAL THICKNESS SHALL BE PROVIDED AT ENDS AND AT ALL SUPPORTS OF JOISTS AND RAFTERS. BETWEEN SUPPORTS PROVIDE BLOCKING OR BRIDGING AT 8' - 0" O.C.

ALL SILL PLATES AT SHEAR WALLS TO BE 3X, PRESERVATIVE TREATED DOUGLAS-FIR #2, U.N.O. ON THE PLANS. SILL PLATES SHALL HAVE A MOISTURE CONTENT OF NOT GREATER THAN 19% BEFORE BEING COVERED WITH INSULATION, INTERIOR WALL FINISH, FLOOR COVERING OR OTHER MATERIAL.

ALL STUD WALL SILL AND TOP PLATE MEMBERS SHALL BE SURFACE-DRIED (S-DRY) LUMBER (MOISTURE CONTENT = 19% OR LESS DURING FRAMING). ALL STUDS AND POSTS MAY BE SURFACE-GREEN (S-GREEN) LUMBER (MOISTURE CONTENT = 19% TO 23% DURING FRAMING) OR S-DRY LUMBER. THE MOISTURE CONTENT OF THE FRAMING SHALL BE LESS THAN 12 % PRIOR TO INSTALLATION OF GYPSUM WALLBOARD SHEATHING.

WOOD CONNECTORS:
WHERE THE STRUCTURE IS LOCATED IN SDC A, B OR C CHANGE 3"X3"X1/4" PLATE WASHERS TO "STANDARD" WASHERS.

SILL BOLTS TO BE 3/4" DIAMETER EMBEDDED 7" INTO THE CONCRETE. MAXIMUM SPACING OF SILL BOLTS SHALL BE 48" O.C. AT DESIGNATED SHEARWALLS SILL BOLT SPACING SHALL BE PER THE PLANS. USE GALVANIZED 3" X 3" X 1/4" PLATE WASHERS, WITH HOLES NO GREATER THAN 3/16" LARGER THAN THE BOLT DIAMETER AT ALL SHEARWALL SILL BOLTS. PROVIDE A MINIMUM OF TWO BOLTS EACH PIECE. PROVIDE ONE BOLT AT EACH END OF EACH PIECE, NOT LESS THAN 6" AND NOT MORE THAN 12" FROM THE END.

BOLT HEADS AND NUTS BEARING AGAINST WOOD TO BE PROVIDED WITH MALLEABLE IRON WASHERS EXCEPT ON STEEL BEAM NAILERS USE CUT WASHERS. NAILERS TO STEEL BEAMS SHALL BE ATTACHED WITH 5/8" BOLTS AT 3' - 0" O.C. STAGGERED.

NAILS SHALL CONFORM TO REQUIREMENTS OF ASTM F 1667 AND HAVE A MINIMUM BENDING STRENGTH OF 90 KSI FOR SHANK DIAMETERS BETWEEN .142" AND .177". ALL WOOD-TO-WOOD NAILING SHALL BE PER IBC TABLE 2304.10.1 IF PLANS AND DETAILS SPECIFY 8D, 10D OR 16D NAILS, THEY SHALL HAVE THE FOLLOWING PROPERTIES:

8D = 0.131" DIA X 2-1/2"
10D = 0.148" DIA X 3"
16D = 0.162" DIA X 3-1/2"

ALL SUBSTITUTIONS SHALL HAVE THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD PRIOR TO USE.

LIGHT GAUGE METAL FRAMING CONNECTORS AND THEIR REQUIRED FASTENERS SHALL BE "STRONG-TIE" BY SIMPSON COMPANY, OR APPROVED EQUAL.

ALL FASTENERS AND CONNECTORS IN CONTACT WITH PRESERVATIVE TREATED WOOD SHALL BE HOT-DIPPED GALVANIZED STEEL WITH A G185 SPECIFICATION OR TYPE 304 & 316 STAINLESS STEEL. TYPE 304 AND 316 STAINLESS STEEL SHOULD BE USED FOR ALL CONNECTORS AND FASTENERS IN CONTACT WITH AZCA TREATED WOOD AND SOME VARIATIONS OF ACQ TREATED WOODS. HOT-DIPPED GALVANIZED STEEL SHOULD NEVER COME IN CONTACT WITH STAINLESS STEEL.

PLYWOOD/ OSB:
PLYWOOD/OSB ROOF, FLOOR AND WALL SHEATHING TO BE APA RATED C-D EXPOSURE 1 PER APA "PLYWOOD DESIGN SPECIFICATION" (Y510). MAXIMUM FASTENER SPACING SHALL BE 6" O.C. AT ALL SUPPORTED PANEL EDGES, AND 12" O.C. AT INTERMEDIATE SUPPORTS. FASTENERS INTO WOOD MEMBERS SHALL BE 10D NAILS PER THE "WOOD CONNECTORS" SECTION. FASTENERS INTO COLD-FORMED STEEL MEMBERS SHALL BE #10 SCREWS PER THE "COLD-FORMED STEEL CONNECTORS" SECTION.

STAGGER END LAPS AT ROOF AND FLOOR SHEATHING. ALL PANEL EDGES TO BE BLOCKED AT SHEAR WALLS. SUPPORT SHALL BE SUPPLIED TO ALL PLYWOOD EDGES WITH PLYCLIPS, BLOCKING, TONGUE AND GROOVE PLYWOOD JOINTS OR OTHER APPROVED METHODS PER APA RECOMMENDATION. PLYCLIPS ARE NOT ALLOWED FOR FLOOR SHEATHING.

PRESERVATIVE TREATMENT:
ALL LUMBER, TIMBER, PLYWOOD, GLUE-LAMINATED AND OTHER COMPOSITE LUMBER THAT IS IN CONTACT WITH CONCRETE OR MASONRY OR EXPOSED TO WEATHER SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH CURRENT AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA) PRESERVATIVE (P) STANDARDS. THESE MEMBERS SHALL BE TREATED WITH AN APPROVED PRESERVATIVE IN ACCORDANCE WITH CURRENT AWPA COMMODITY (C) STANDARDS AND THE AWPA USE CATEGORY SYSTEM (UCS). WHEREVER POSSIBLE, PRECUT ALL MATERIAL BEFORE TREATMENT. HANDLE TREATED LUMBER IN ACCORDANCE WITH AWPA M4 STANDARDS.

FIELD CUTS, HOLES (SUCH AS ANCHOR BOLT HOLES IN TREATED SILL PLATES) AND PENETRATION DAMAGE SHALL BE TREATED IN ACCORDANCE WITH THE CURRENT AWPA M4 STANDARDS. THE MOST COMMONLY AVAILABLE PRESERVATIVE MEETING THE REQUIREMENTS OF STANDARD M4 IS A COPPER NAPHTHENATE SOLUTION CONTAINING AT LEAST 2% COPPER. CERTAIN DAP, WM BARR, CUPRINOL, BEHR, GREEN'S, JASCO, HENRY AND FIELDS PRESERVATIVE PRODUCTS CONTAIN THIS METAL CONTENT.

ALL FASTENERS AND CONNECTORS IN CONTACT WITH PRESERVATIVE TREATED WOOD SHALL BE HOT-DIPPED GALVANIZED OR TYPE STAINLESS STEEL. SEE THE "WOOD CONNECTORS" SECTION.

STRUCTURAL GLUED-LAMINATED LUMBER:
SHALL BE FABRICATED TO THE REQUIREMENTS OF ANSI/AITC A190.1. LUMBER SHALL BE VISUALLY GRADED WESTERN SPECIES, COMBINATION 24F-V4 FOR SIMPLE BEAMS, 24F-V8 FOR CANTILEVER BEAMS AND COLUMNS. LAMINATED MEMBERS TO BE AITC CERTIFIED. ADHESIVES USED IN THE GLULAM MANUFACTURING PROCESS SHALL CONFORM TO AITC 405 FOR WET USE ADHESIVES.

MANUFACTURED STRUCTURAL WOOD MEMBERS:
LVL SHOWN ON PLANS TO BE REDBUILT MICROLLAM™ OR APPROVED EQUAL. LVL MATERIAL SHALL BE OF WESTERN SPECIES. MODULUS OF ELASTICITY (E) SHALL BE 2,000 KSI MINIMUM, WITH CORRESPONDING BASE FB = 2,900 PSI AND FV = 285 PSI. LVL ASSEMBLY TO BE TESTED UNDER IBC TESTING PROCEDURES. LVL MANUFACTURER SHALL PROVIDE ALL SPECIALTY ITEMS FOR A NORMAL AND COMPLETE INSTALLATION OF THE MEMBERS. ALL LVL'S OTHER THAN REDBUILT SHALL HAVE ICC APPROVALS SUBMITTED TO THE ARCHITECT FOR REVIEW.

SCOPE OF STRUCTURAL ENGINEERING SERVICES:
THE STRUCTURAL ENGINEER HAS PERFORMED THE STRUCTURAL DESIGN AND PREPARED THE STRUCTURAL WORKING DRAWINGS FOR THIS PROJECT. THE CONSTRUCTION MUST BE PERFORMED IN STRICT ACCORDANCE WITH THE STRUCTURAL DRAWINGS. ANY DEVIATION FROM THE DRAWINGS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. ERRORS AND/OR OMISSIONS FOUND ON THE STRUCTURAL DRAWINGS MUST BE BROUGHT TO THE STRUCTURAL ENGINEER'S ATTENTION IMMEDIATELY.

ARCHITECTURAL DRAWINGS ARE THE PRIME CONTRACT DRAWINGS. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS. PRIMARY STRUCTURAL ELEMENTS ARE DIMENSIONED ON THE STRUCTURAL PLANS AND DETAILS. THE GENERAL CONTRACTOR SHALL VERIFY AND COORDINATE DIMENSIONS AMONG ALL DRAWINGS. ANY DISCREPANCIES, CONTRADICTIONS, OR OMISSIONS SHALL BE REPORTED TO THE ARCHITECT FOR RESOLUTION PRIOR TO PROCEEDING WITH WORK OR FABRICATION OF THE ITEM(S) IN QUESTION.

THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR THE DESIGN OF THE PRIMARY STRUCTURAL SYSTEM, EXCEPT FOR ANY COMPONENTS NOTED ABOVE. RESPONSIBILITY FOR ANY SECONDARY STRUCTURAL AND NON-STRUCTURAL SYSTEMS NOT SHOWN ON THE STRUCTURAL PLANS RESTS WITH SOMEONE OTHER THAN THE STRUCTURAL ENGINEER.

THE STRUCTURE SHOWN ON THESE DRAWINGS IS STRUCTURALLY SOUND ONLY IN ITS COMPLETED FORM. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BRACING TO STABILIZE THE BUILDING DURING CONSTRUCTION.

THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR, AND WILL NOT HAVE CONTROL OF, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE CONSTRUCTION WORK, NOR WILL HE BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO CARRY OUT THE CONSTRUCTION WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

FIELD MEASUREMENTS AND THE VERIFICATION OF FIELD DIMENSIONS ARE NOT PART OF THE STRUCTURAL ENGINEER'S RESPONSIBILITY. THE CONTRACTOR MUST CHECK ALL (ASSUMED) EXISTING CONDITIONS SHOWN ON THESE DRAWINGS FOR ACCURACY AND NOTIFY THE STRUCTURAL ENGINEER OF ANY DISCREPANCIES.

SPECIAL INSPECTION SCHEDULE

REQUIRED INSPECTIONS, VERIFICATION AND TESTS OF SOILS

TYPE	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC REFERENCE
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY		X		
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X		
PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X		
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL		X		
PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X		

REQUIRED INSPECTIONS, VERIFICATION AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC REFERENCE
INSPECT REINFORCEMENT AND VERIFY PLACEMENT		X	ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
REINFORCING BAR WELDING: a.VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706		X	AWS D1.4 ACI 318: 26.6.4	
b.INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"		X		
c. INSPECT ALL OTHER WELDS		X		
INSPECT ANCHORS CAST IN CONCRETE		X	ACI 318: 17.8.2	
INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS (b)				
a. ADHESIVE ANCHORS INSTALLED HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS	X		ACI 318: 17.8.2.4	
b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN (a)		X	ACI 318: 17.8.2	
VERIFY USE OF REQUIRED DESIGN MIX (fc > 2500 PSI)		X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PREFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	X		ASTM C172 ASTM C31 ACI 318: 26.4, 26.12	1908.1
INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	X		ACI 318: 26.5	1908.6, 1908.7, 1908.8
VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES			ACI 318: 26.5.3-26.5.5	1908.9
INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED		X	ACI 318: 26.11.1.2(b)	
NON-STRUCTURAL SLABS ON GRADE	NOT REQUIRED	NOT REQUIRED		1705.3

REQUIRED INSPECTIONS AND VERIFICATIONS FOR WOOD

TYPE	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC REFERENCE
PLYWOOD DIAPHRAGMS WHERE PANEL EDGES HAVE MULTIPLE LINES OF FASTENERS: SPECIAL INSPECTOR VERIFY WOOD PANEL THICKNESS AND GRADE, SIZE OF FRAMING MEMBERS, NAIL DIAMETER AND LENGTH, NUMBER OF FASTENER LINES AND SPACING, AND EDGE DISTANCE		X		1705.5.1
PLYWOOD DIAPHRAGMS WITH 4" AND CLOSER PANEL EDGE NAILING: SPECIAL INSPECTOR VERIFY NAIL SIZE AND SPACING, BOLTING, SHEAR WALL ANCHORING AND HOLD-DOWNS, AND DRAG STRUTS OF LATERAL FORCE-RESISTING SYSTEM		X		1705.11.1, 1705.12.2
PLYWOOD DIAPHRAGMS WITH 6" OC PANEL EDGE NAILING	NOT REQUIRED	NOT REQUIRED		17.05.11.1

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STATE OF ALASKA
49TH
Ronald E. Martinson
No. CE9279
REGISTERED PROFESSIONAL ENGINEER

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed

under the laws of the State of

License Number: Date

Revisions		
Description	Date	Num
Add'm 1	3.10.22	

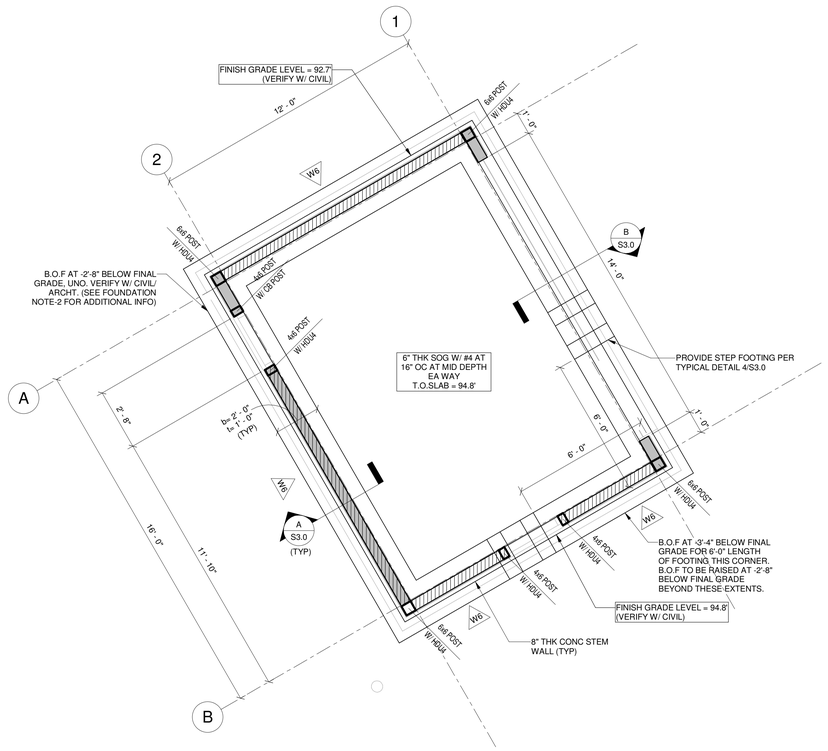
Comm:
Date: **01/21/22**
Drawn: **MSV**
Check: **PSM**

GENERAL NOTES AND SPECIAL INSPECTIONS

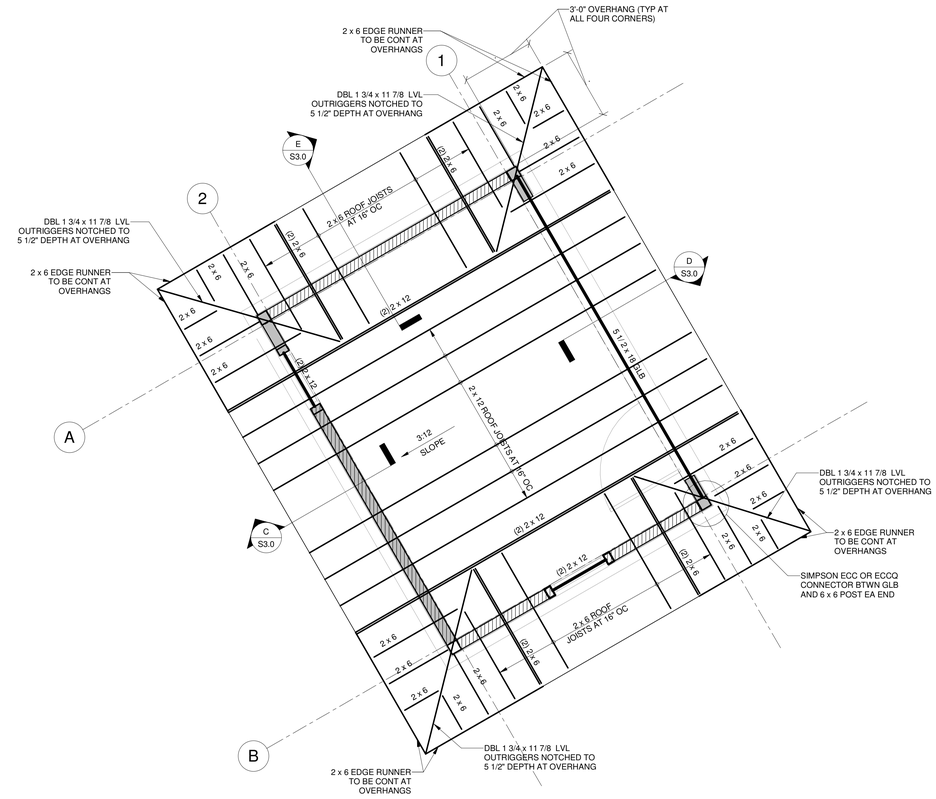
Scale: **12" = 1'-0"**

S1.0

MN



1 FOUNDATION PLAN
3/8" = 1'-0"



2 ROOF FRAMING PLAN
3/8" = 1'-0"

FOUNDATION NOTES

1. COORDINATE DIMENSIONS WITH ARCHITECTURAL PLANS. DIMENSIONS ARE CONTROLLED BY THE ARCHITECTURAL DRAWINGS. ANY DISCREPANCY IN DIMENSION BETWEEN ARCHITECTURAL AND STRUCTURAL DRAWINGS MUST BE BROUGHT TO THE ENGINEER'S ATTENTION.
2. TOP OF FOOTING ELEVATION WILL VARY WITH FINAL GRADE ELEVATION. GC TO COORDINATE WITH CIVIL AND ARCHITECTURAL DRAWINGS TO VERIFY THAT THE BOTTOM OF ALL FOOTINGS ARE AT LEAST 2'-8" BELOW THE FINAL FINISHED GRADE. STEM WALLS AT CONTINUOUS FOUNDATION MAY BE REQUIRED TO ACCOMMODATE THE FINAL GRADE VARIATIONS. FOOTINGS TO BE LOWERED BELOW (E) UTILITY LINES. CO-ORDINATE W/ CIVIL/ARCHT.
3. SHADED WALLS DENOTE BEARING WALLS W/ 2x STUDS AT 16" OC. WALL TYPE TO BE PER SECTIONS AND AS PER ARCHT DRAWINGS
4. INDICATES EXTENT OF SHEARWALL.
5. WX — DENOTES A SHEARWALL.
6. HD-XX — DENOTES REQUIRED SIMPSON HOLDOWN AT ENDS OF SHEARWALL. SEE 2/S3.0 FOR TYPICAL DETAIL.
7. ANCHORAGE OF EQUIPMENT OVER SLAB ON GRADE TO BE BY EQUIPMENT SUPPLIER. THICKER SLAB MAY BE REQUIRED TO MEET ANCHORAGE REQUIREMENTS. GC TO COORDINATE THE SAME WITH EQUIPMENT SUPPLIER.

WOOD ROOF FRAMING NOTES

1. COORDINATE DIMENSIONS WITH ARCHITECTURAL PLANS.
2. COORDINATE WITH ARCHITECTURAL AND MECHANICAL PLANS FOR LOCATION AND SIZE OF ROOF AND WALL OPENINGS.
3. ROOF DIAPHRAGM TO BE 5/8" CDX (P.I.=48/24) PLYWOOD APPLIED DIRECTLY OVER ROOF JOISTS, SEE S1.0 FOR NAILING. PLACE LONG DIRECTION OF PLYWOOD SHEETS PERPENDICULAR TO ROOF JOISTS AND STAGGER LAPS.
4. SEE THE GENERAL NOTES AND SPECIAL INSPECTIONS ON SHEET S1.0 FOR ADDITIONAL INFORMATION.
5. LAYOUT OF ALL EXTERIOR WALL OPENINGS TO BE CO-ORDINATED W/ ARCHT DWGS. REPORT TO ENGINEER OF RECORD IN CASE OF ANY DISCREPANCY.
6. USE SIMPSON LSSR HANGERS FOR CONNECTING SLOPED AND SKEWED MEMBERS AT OVERHANG CORNERS.

A

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Revisions		
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Addm 1	3.10.22	

Comm:
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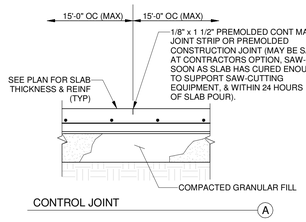
Check: PSM
North

FOUNDATION PLAN AND ROOF FRAMING PLAN

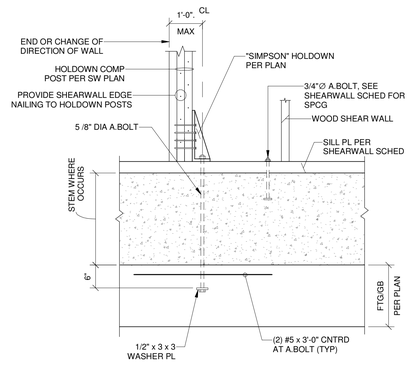
Scale: As indicated

S2.0

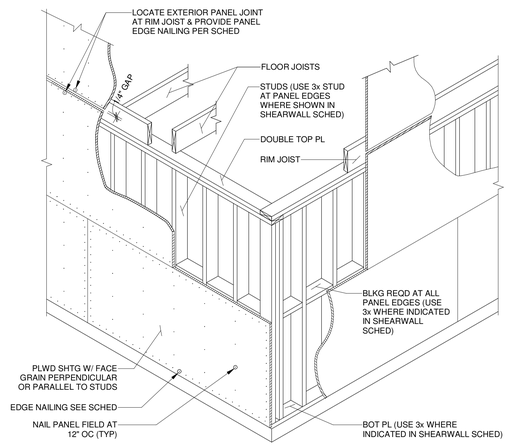
MN



1 TYPICAL SLAB ON GRADE CONTROL JOINT DETAIL
3/4" = 1'-0"



2 HOLDOWN DETAIL
3/4" = 1'-0"

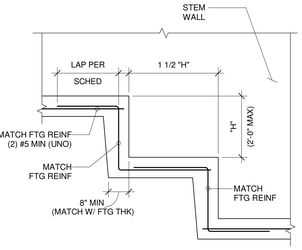


3 TYPICAL SHEARWALL NAILING
3/8" = 1'-0"

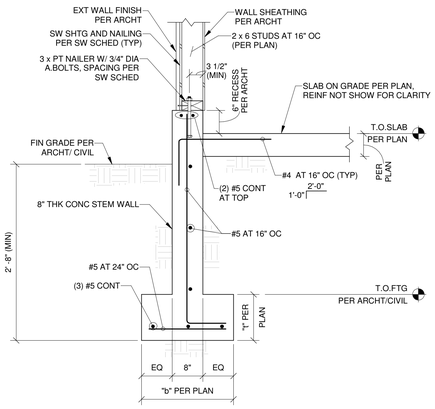
SHEARWALL SCHEDULE						
LABEL	APA RATED SHEATHING	NAIL SIZE & SPACING AT EDGES	STUD & BLKG SIZE AT ADJOINING EDGES	RIM JOIST OR BLOCK CONN TO TOP PLATE	BOTTOM PL ATTACHMENT	SILL PLATE ATTACHMENT
					NAILING TO WOOD BELOW	ANCHOR BOLT TO CONC BELOW / SILL PLATE SIZE AT DF #1 FOUNDATION
"W"=WOOD	(1) (2) (4) (12) (13)	(4) (5)	(3) (6) (14)	(7) (8)	(9)	(10) (15) / (11)
W6	15/32" ONE SIDE	0.148" DIA x 3" AT 6" OC	2 x	A35 CLIP AT 16" OC	0.162" DIA x 3 1/2 " AT 6" OC	3/4" DIA AT 32" OC / 3 x

(ALL FASTENER SPACING ARE FOR USE W/ DOUGLAS FIR MATERIAL)

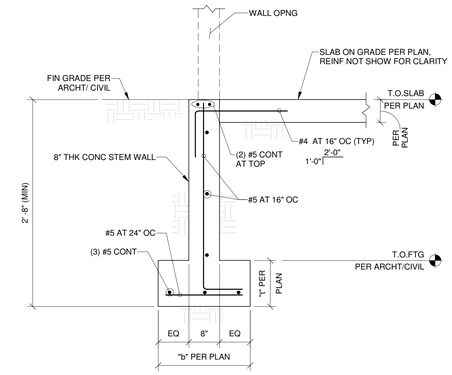
NOTES:
1. INSTALL PANELS EITHER HORIZONTALLY OR VERTICALLY DIRECTLY ON STUDS.
2. WHERE SHEATHING IS APPLIED ON BOTH SIDES OF WALL, PANEL EDGE JOINTS SHALL BE STAGGERED SO THAT JOINTS ON OPPOSITE SIDES OF THE WALL ARE NOT LOCATED ON THE SAME STUDS.
3. BLOCKING IS REQUIRED AT ALL PANEL EDGES.
4. PROVIDE SHEAR WALL SHEATHING AND NAILING FOR THE ENTIRE LENGTH OF THE WALLS INDICATED ON THE PLANS. ENDS OF FULL HEIGHT WALLS ARE DESIGNATED BY EXTERIOR OF THE BUILDING, CORRIDORS, WINDOWS OR DOORWAYS OR AS DESIGNATED ON PLANS. SEE PLANS FOR HOLDOWN REQUIREMENTS. (ALTERNATE NOTE: WALLS DESIGNATED AS PERFORATED SHEARWALLS REQUIRE SHEATHING ABOVE AND BELOW ALL OPENINGS).
5. SHEATHING EDGE NAILING IS REQUIRED AT ALL HOLDOWN POSTS. EDGE NAILING MAY ALSO BE REQUIRED TO EACH STUD USED IN BUILT-UP HOLDOWNS POSTS. REFER TO THE HOLDOWN DETAILS FOR ADDITIONAL INFORMATION.
6. INTERMEDIATE FRAMING TO BE WITH 2x MINIMUM MEMBERS. FIELD NAILING 12" OC (SEE 3/S3.0).
7. BASED ON 0.131" DIA x 11/2" LONG NAILS USED TO ATTACH FRAMING CLIPS DIRECTLY TO FRAMING. USE 0.131" DIA x 21/2" NAILS WHERE INSTALLED OVER SHEATHING.
8. FRAMING CLIPS: AS NOTED IN TABLE OR APPROVED EQUIVALENT. PROVIDE AT 24" OC (MIN) AT NON-SHEARWALLS.
9. WHERE PLATE ATTACHMENT SPECIFIES (2) ROWS OF NAILS, PROVIDE DOUBLE JOIST, RIM OR EQUAL. ATTACH PER DETAILS.
10. ANCHOR BOLTS SHALL BE PROVIDED WITH STEEL PLATE WASHERS MIN 3" x 3" x 0.229", LOCATE PLATE WASHERS WITHIN 1/2" OF THE EDGE OF THE BOTTOM PLATE ON THE SIDES WITH SHEATHING. EMBED ANCHOR BOLTS 7" MINIMUM INTO THE CONCRETE.
11. PRESSURE TREATED MATERIAL CAN CAUSE EXCESSIVE CORROSION IN THE FASTENERS. PROVIDE HOT-DIPPED GALVANIZED NAILS (ELECTRO-PLATING IS NOT ACCEPTABLE) AND CONNECTOR PLATES (FRAMING ANGLES, ETC) FOR ALL CONNECTORS IN CONTACT WITH PRESSURE TREATED FRAMING MEMBERS (SEE GENERAL NOTES FOR REQUIRED GALVANIZING THICKNESS).
12. APA RATED ORIENTED STRAND-BOARD (OSB) SHEATHING OF THE SAME THICKNESS MAY BE USED IN PLACE OF 15/32" SHEATHING PROVIDED THAT ALL STUDS ARE SPACED AT 16" OC OR CLOSER.
13. WHERE WOOD SHEATHING (W) IS APPLIED OVER GYPSUM SHEATHING, CONTACT THE ENGINEER OF RECORD FOR ALTERNATE NAILING REQUIREMENTS.
14. AT ADJOINING PANEL EDGES, (2) 2x STUDS NAILED TOGETHER MAY BE USED IN PLACE OF A SINGLE 3x STUD. DOUBLE 2x STUDS SHALL BE CONNECTED TOGETHER BY NAILING THE STUDS TOGETHER WITH 3" LONG NAILS OF THE SAME SPACING AND DIAMETER AS THE PLATE NAILING.
15. ALL SILL PLATE ANCHOR BOLTS SHALL BE CAST-IN-PLACE EXCEPT WHERE NOTED OTHERWISE ON PLAN & DETAILS. ADHESIVE OR EXPANSION ANCHORS MAY NOT BE USED WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER OF RECORD. (SPECIAL INSPECTION WILL BE REQUIRED).
16. "W" = SHEARWALLS SHEATHED WITH APA RATED CDX OR OSB



4 TYPICAL STEPPED FOOTING DETAIL
3/4" = 1'-0"



A SECTION
3/4" = 1'-0"



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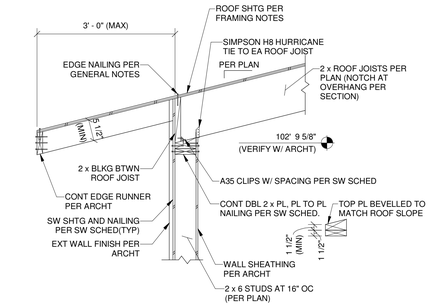
3/4" = 1'-0"



C SECTION
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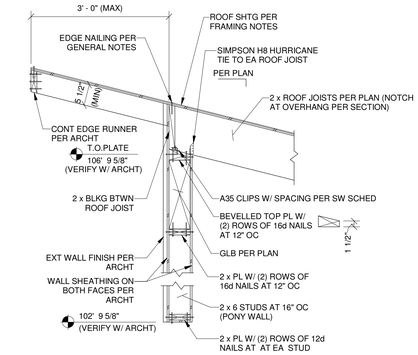

D SECTION
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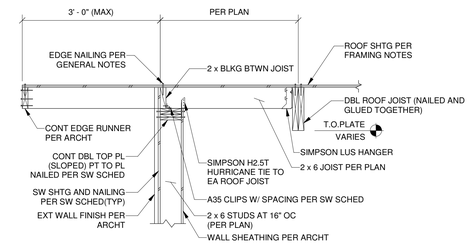

E SECTION
3/4" = 1'-0"

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Check: **PSM**

TYPICAL DETAILS AND SECTIONS

Scale: **As Indicated**

S3.0

ELECTRICAL SYMBOL SCHEDULE

GENERAL ELECTRICAL SYMBOLS

A. DEVICES SHALL BE MOUNTED AT THE HEIGHT INDICATED, UNLESS NOTED OTHERWISE. HEIGHTS ARE MEASURED TO FROM DEVICE CENTER TO FINISHED FLOOR. DEVICES MOUNTED IN BLOCK/BRICK WALLS SHALL CORRESPOND WITH BLOCK/BRICK COURSING. SEE MASONRY BACKBOX MOUNTING HEIGHT DETAIL.

B. ALL MOUNTING HEIGHTS INDICATED ARE FROM THE FINISH FLOOR TO THE CENTER OF THE BOX.

C. ON DEMOLITION DRAWINGS, DASHED ELECTRICAL ITEMS DENOTES EXISTING ITEMS TO BE REMOVED; SOLID SCREENED ELECTRICAL ITEMS DENOTES EXISTING ITEMS TO REMAIN, UNLESS NOTED OTHERWISE

D. ON NEW WORK LIGHTING, POWER AND SYSTEMS DRAWINGS, SCREENED ELECTRICAL ITEMS DENOTES EXISTING ITEMS TO REMAIN; SOLID ELECTRICAL ITEMS DENOTES NEW ITEMS, UNLESS NOTED OTHERWISE

DEVICES TO BE DEMOLISHED: F

EXISING DEVICES TO REMAIN: F

NEW DEVICES: F

SYMBOL	DESCRIPTION
#	KEYED NOTE.
#	FEEDER OR EQUIPMENT DRAWING NOTE.
# E#	ELEVATION, SEE DETAIL # ON SHEET E#.

POWER DISTRIBUTION AND EQUIPMENT

SYMBOL	DESCRIPTION
	SWITCHBOARD WITH CONCRETE PAD: FLOOR MOUNTED.
	RELAY/CONNECTION CABINET; WALL MOUNTED, WITH TOP AT 72" AFF
	PANELBOARD; WALL MOUNTED WITH TOP AT 72" AFF.
ATS	AUTOMATIC TRANSFER SWITCH; WALL OR FLOOR MOUNTED.
T	TRANSFORMER, WITH SIZE AS NOTED. SEE RISER DIAGRAM, SCHEDULE OR FLOOR PLANS; VERIFY.
PB	PULLBOX
HH	HANDHOLE
MCC	MOTOR CONTROL CENTER (W/CONCRETE PAD); FLOOR MOUNTED.
	PLUG-IN BUS DUCT SWITCH; SIZE AS INDICATED AND SPECIFIED. VERIFY MOUNTING HEIGHT.
M	METER/SOCKET ASSEMBLY; MOUNT TOP AT 72" AFF

BRANCH CIRCUIT, FEEDER, AND RACEWAY

SYMBOL	DESCRIPTION
	INDICATES CONDUIT ROUTED BELOW, IN FLOOR STRUCTURE, BELOW GRADE, OR AS NOTED.
	GROUND
	INDICATES CONDUIT IS SURFACE MOUNTED
	INDICATES CONDUIT ROUTED CONCEALED ABOVE FLOOR OR GRADE (IN CEILING OR WALL)
	INDICATES CONDUIT UP
	INDICATES CONDUIT DOWN
	CONDUIT STUB - TERMINATION INDICATED BY NOTE
	CONDUIT CONTINUATION
SL#	CONDUIT SLEEVE WITH BUSHINGS ON BOTH ENDS, SEE SCHEDULE FOR QUANTITIES AND SIZES OF SLEEVES
12"X4"	CABLE TRAY (WIDTH X DEPTH)
1"C,3#4+1#3G	INDICATES 1" CONDUIT, (3) NO. 4 AWG CONDUCTORS AND (1) NO. 3 GROUND WIRE
	SURFACE RACEWAY ASSEMBLY. PROVIDE AS SPECIFIED, UNLESS NOTED OTHERWISE.

LIGHTING

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	RECESSED LUMINAIRE (TYPE DENOTED)	
	SURFACE MOUNTED LUMINAIRE (TYPE DENOTED)	
	LUMINAIRE ON EMERGENCY CIRCUIT, SWITCHED	
	LUMINAIRE ON EMERGENCY CIRCUIT, UNSWITCHED	
	STRIP LIGHT LUMINAIRE; FOR SUSPENDED MOUNTING HEIGHTS, SEE DRAWINGS.	
	WALL MOUNTED LUMINAIRE; SEE REFLECTED CEILING PLAN FOR MOUNTING HEIGHT.	
	LINEAR PENDANT LUMINAIRE; FOR SUSPENDED MOUNTING HEIGHTS, SEE DRAWINGS.	
	CIRCULAR PENDANT LUMINAIRE; FOR SUSPENDED MOUNTING HEIGHTS, SEE DRAWINGS.	
	TRACK LIGHT LUMINAIRE (WITH HEADS OR PENDANTS); LENGTH AND MOUNTING AS NOTED ON DRAWINGS.	
	EXIT LIGHT-FACE SHOWN SHADED; PLAN INDICATES CEILING OR WALL MOUNTING AND DIRECTIONAL ARROWS.	
	EMERGENCY LIGHTING UNIT - TWO HEAD MOUNTING AS INDICATED ON DRAWINGS.	
	POLE MOUNTED SITE LUMINAIRE - SINGLE SQUARE HEAD. NUMBER OF HEADS AS SHOWN.	

LIGHTING CONTROL

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
##	SWITCHING NOTATION. ## INDICATES THE FOLLOWING: 3 THREE-WAY 4 FOUR-WAY D DIMMER K KEYED LV LOW VOLTAGE MC MOMENTARY CONTACT OS INTEGRAL OCCUPANCY SENSOR PL LIGHTED PILOT LIGHT TD TIME DELAY EACH SYMBOL DENOTES A SINGLE POLE LIGHT SWITCH WHEN MULITPLE SWITCHES ARE SHOWN, LOCATE ALL UNDER SINGLE MULTI-SWITCH COVERPLATE.	46"
L PC / L PC	PHOTOCELL - WALL, CEILING, OR ROOF MOUNTED; SEE DRAWINGS.	
L OS# / L OS#	OCCUPANCY SENSOR - WALL OR CEILING CELING MOUNT OS# INDICATES TYPE PER OCCUPANCY SENSOR SCHEDULE	46"
R / R	EMERGENCY LIGHTING RELAY (UL 924) - SEE WIRING SCHEMATIC ON DETAIL SHEETS.	

SECURITY DEVICES

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
## S	SECURITY DEVICE. ## INDICATES THE FOLLOWING: CM CONTROL MODULE DC DOOR CONTACTS (MONITORING) EL ELECTRIC LOCK/LATCH ES ELECTRIC STRIKE GB GLASS BREAK DETECTOR IR INFARED DETECTOR ML MAGNETIC LOCK XP EXIT PUSHBUTTON, MOUNT AT ADA HT XS EXIT SENSOR	
CR S	CARD READER ROUGH-IN AT ADA HEIGHT	46"
DR S	DOOR RELEASE; MOUNT PER DWGS.	46"
EE S	ELECTRIC EYE; MOUNT PER DWGS.	46"
KP S	KEYPAD; VERIFY MOUNTING HEIGHT WITH DWGS.	46"
LA S	LOCAL ALARM	46"
MC S	MASTER CONTROL STATION	
MD S / MD S	MOTION DETECTOR; ARROW INDICATES DIRECTION. (WALL OR CEILING MOUNTED).	
R P	PHOTO-ELECTRIC RECEIVER; MOUNT PER DWGS.	
T P	PHOTO-ELECTRIC TRANSMITTER; MOUNT PER DWGS.	
S / S	SECURITY CAMERA, CLOSED CIRCUIT. (WALL OR CEILING MOUNTED, 3/4"C. BUSHED EMT TO ACCESSIBLE CEILING). CAMERAS BY OTHERS.	
S	360° SECURITY CAMERA, CLOSED CIRCUIT. (WALL OR CEILING MOUNTED, 3/4"C. BUSHED EMT TO ACCESSIBLE CEILING). CAMERAS BY OTHERS.	

COMMUNICATION DEVICES

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
S S WG	PAGING/INTERCOM SPEAKER HORN ASSEMBLY- P.A. OR AS INDICATED (3/4"C. BUSHED EMT TO ACCESSIBLE CEILING). WG = WIREGUARD	90"
S S WG	LOUD SPEAKER HORN ASSEMBLY- PA OR SOUND SYSTEM AS INDICATED; VERIFY MOUNTING HEIGHT. (3/4"C. BUSHED EMT TO ACCESSIBLE CEILING). WG = WIREGUARD	
S Z# / S AV / S PA	SPEAKER WITH INTEGRAL VOLUME CONTROL AND BACKBOX (WALL OR CEILING); VERIFY MOUNTING HEIGHT. PA = SPEAKER FOR P.A. SYSTEM; AV = SPEAKER FOR LOCAL AV SYSTEM; Z# = ZONE NUMBER. (3/4"C. BUSHED EMT TO ACCESSIBLE CEILING). MOUNT 12" BELOW CEILING OR AS INDICATED ON PLANS.	
M / M	MICROPHONE OUTLET (WALL OR CEILLING). (1/2"C. BUSHED EMT TO ACCESSIBLE CEILING).	18"
A	AUXILIARY INPUT CONNECTOR. (1/2"C. BUSHED EMT TO ACCESSIBLE CEILING).	18"
# I	INTERCOM. M = MASTER STATION. (1/2"C. BUSHED EMT TO ACCESSIBLE CEILING).	TOP AT 46" AFF
TV / TV	COMMUNICATIONS OUTLET FOR TV (WALL OR CEILING). (BUSHED EMT TO ACCESSIBLE CEILING SPACE OR AS INDICATED). SEE DETAIL SHEETS.	18"
V	VOLUME CONTROL. (1/2"C. BUSHED EMT TO ACCESSIBLE CEILING).	46"
	CALL BACK SWITCH. (1/2"C. BUSHED EMT TO ACCESSIBLE CEILING).	46"
C / C	TV/VIDEO CAMERA, CLOSED CIRCUIT. (WALL OR CEILING MOUNTED, 3/4"C. BUSHED EMT TO ACCESSIBLE CEILING). MOUNT PER DRAWINGS. CAMERA BY OTHERS.	
C D / C	CLOCK OUTLET. (3/4"C. BUSHED EMT TO ACCESSIBLE CEILING). D = DOUBLE FACED	90"
B	BELL/AUDIBLE DEVICE. (3/4"C. BUSHED EMT TO ACCESSIBLE CEILING).	90"
##	WALL DATA AND COMMUNICATIONS OUTLET: (BUSHED EMT TO ACCESSIBLE CEILING SPACE OR AS INDICATED). ## INDICATES TYPE OF OUTLET. SEE DETAIL SHEETS.	18"
## / WAP	CEILING DATA OUTLET AND WIRELESS ACCESS POINT: (BUSHED EMT TO ACCESSIBLE CEILING SPACE OR AS INDICATED). ## INDICATES TYPE OF OUTLET. SEE DETAIL SHEETS.	

FIRE ALARM DEVICES

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
FAAP	FIRE ALARM ANNUNCIATOR PANEL;	TOP AT 60" AFF
FACP	FIRE ALARM CONTROL PANEL (MASTER);	TOP AT 68" AFF
NAC	FIRE ALARM NOTIFICATION APPLIANCE CIRCUIT PANEL. MOUNT TOP 62" AFF PLUS OR MINUS 2".	TOP AT 62 ± 2" AFF
F	FIRE ALARM MANUAL PULL STATION.	46"
F	FIRE ALARM HORN (AUDIBLE), WALL MOUNTED.	84"
B F / F	FIRE ALARM CHIME (WP FOR EXTERIOR MOUNTING). B = BELL.	84"
## F / ## F	FIRE ALARM STROBE (VISUAL) DEVICE (WALL OR CEILING MOUNTED).	84"
## F / ## F	FIRE ALARM HORN/STROBE (COMBINATION) (WALL OR CEILING MOUNTED). ## INDICATE THE FOLLOWING: WG WIRE GUARD WP WEATHER PROOF VE VOICE EVAC	84"
## F / ## F	FIRE ALARM VOICE/STROBE (COMBINATION) (WALL OR CEILING MOUNTED). ## INDICATE THE FOLLOWING: WG WIRE GUARD WP WEATHER PROOF	84"
S FA / S FA	FIRE ALARM SPEAKER WITH BACKBOX (WALL OR CEILING); VERIFY MOUNTING HEIGHT. (3/4"C. BUSHED EMT TO ACCESSIBLE CEILING).	84", CLG
F	FIREMAN PHONE JACK; MOUNT TOP 54" AFF PLUS OR MINUS 2".	
D F	MAGNETIC DOOR HOLD-OPEN (WALL MOUNTED); MOUNT PER DWGS.	
FL F	SPRINKLER FLOW-SWITCH; MOUNT PER DWGS.	
TS F	SPRINKLER TAMPER-SWITCH; MOUNT PER DWGS.	
F S	SMOKE DETECTOR-CEILING MOUNTED.	
F S-CO	COMBINATION SMOKE & CARBON MONOXIDE DETECTOR - CEILING MOUNTED.	
H #°	HEAT DETECTOR (RATE-OF-RISE); #° = FIXTED TEMPERATURE - CEILING MOUNTED.	
SD F	DUCT SMOKE DETECTOR; MOUNT PER DWGS.	
I F	FIRE ALARM INDIVIDUAL ADDRESSABLE MODULE; MOUNT PER DWGS.	
CM F	FIRE ALARM CONTROL MODULE; MOUNT PER DWGS.	
F/S F	FIRE/SMOKE DAMPER; MOUNT PER DWGS.	

POWER AND MOTOR DEVICES

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
##	RECEPTACLE NOTATION. ## INDICATES THE FOLLOWING: AB ABOVE COUNTER, BOTTOM OF BOX 4" ABOVE BACKSPLASH IG ISOLATED GROUND GFI INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER GFI CB GROUND FAULT CIRCUIT INTERRUPTER IN CIRCUIT BREAKER TR TAMPER RESISTANT USB (2) USB PORTS INTEGRAL WITH RECEPTACLE WP WEATHERPROOF	
	SURFACE MOUNTED DUPLEX / QUAD RECEPTACLES AND DATA OUTLETS	
	RECEPTACLES WITH GROUND FAULT CIRCUIT INTERRUPTER	
	DUPLEX RECEPTACLE ON NORMAL CIRCUIT	18"
	DUPLEX RECEPTACLE ON EMERGENCY CIRCUIT	18"
	RECEPTACLE (SINGLE)	18"
	DOUBLE DUPLEX RECEPTACLE (QUAD) ON NORMAL CIRCUIT	18"
	DOUBLE DUPLEX RECEPTACLE (QUAD) ON EMERGENCY CIRCUIT	18"
	SPECIAL PURPOSE OUTLET; RECESSED, MOUNT PER DWGS.	18"
	RECESSED CEILING MOUNTED SINGLE OR DUPLEX RECEPTACLE W/ ADDITIONAL 10' FLEX MC/AC SLACK (COILED); FOR FUTURE DEVICE RELOCATION.	
	USB ONLY DEVICE, (4) USB CHARGING PORTS	18"
J / J	CEILING OR WALL MOUNTED JUNCTION BOX WITH REQUIRED COVERPLATE - PLAN INDICATES FUNCTION	CLG, 18"
MSP	MOTOR RATED SWITCH AND PILOT.	46"
MS	MOTOR RATED SWITCH.	46"
MSS	MOTOR STARTER SWITCH WITH MOTOR RUNNING PROTECTION (ADD RELAY IF CONTROL CONTACTS ARE REQUIRED).	46"
	DISCONNECT SWITCH - NON FUSED.	6'-0"
	DISCONNECT SWITCH - FUSED.	6'-0"
	MOTOR STARTER.	6'-0"
	COMBINATION STARTER/DISCONNECT SWITCH.	6'-0"
EPO	PUSHBUTTON - WALL MOUNTED. EPO = EMERGENCY POWER-OFF.	30" - 36"
ADA	PUSHBUTTON DOOR ACTUATOR - WALL MOUNTED.	33" EXTERIOR 42" INTERIOR
P	POWER POLE (DEVICES AS INDICATED)	
	MOTOR, SEE MOTOR AND EQUIPMENT SCHEDULE	
PT# / J FB#	POKE-THROUGH (PT) OR FLOOR BOX (FB), FULLY RECESSED IN FLOOR. REFER TO POKE-THROUGH AND FLOOR BOX SCHEDULE.	FLR
J	WALL MOUNTED FURNITURE FEED.	18"
J	CORD REEL / CORD AND PLUG SET - CEILING MOUNTED. SEE PLANS FOR MORE INFORMATION.	

NURSE CALL DEVICES

SYMBOL	DESCRIPTION	MOUNTING HEIGHT

N #	NURSE CALL SYSTEM DEVICE. 4" SQUARE BOX WITH 3/4"C. BUSHED EMT TO ACCESSIBLE CEILING, UNLESS NOTED OTHERWISE.
	# INDICATES THE FOLLOWING:
	A = STAFF ASSIST REQUEST
	B = CODE BLUE
	BED = BED INTERFACE (MOUNT 12" AFF, UNLESS NOTED OTHERWISE)
	D = DUTY STATION, 3-GANG BOX
	E = EMERGENCY (PULLCORD)
	E1 = EMERGENCY (PUSHBUTTON)
	L = DOME LIGHT, CENTERED ABOVE DOOR HEADER
	P = PATIENT - CODE BLUE, STAFF ASSIST, PULLCORD, 3-GANG BOX
	P1 = PATIENT - CODE BLUE, STAFF ASSIST, PILLOW SPEAKER, 3-GANG BOX
	P2 = PATIENT - SPEAKER, CALL CORD
	R = RELAY, 4-GANG BOX
	T = TV, MOUNT SAME HEIGHT AS ADJACENT RECEPTACLE
	M = MASTER STATION, 1-GANG BELOW COUNTER TOP
	M1 = MASTER STATION WALL-MOUNTED, 3-GANG BOX
	W = STAFF WORKSTATION, 3-GANG BOX
		46"

N #	DOME LIGHT, CEILING MOUNTED.
	# INDICATES THE FOLLOWING:
	Z = ZONE LIGHT	

# W	WANDERING PATIENT DEVICE; MOUNT PER DWGS. 	
	# INDICATES THE FOLLOWING:
	KP = KEYPAD
	RX = RECIEVER
		42"

W	WANDER ALERT SENSOR; MOUNT ABOVE CEILING.	

GENERAL ELECTRICAL NOTES

A. INSTALL CONCEALED CONDUIT WITH FLUSH J.B.'S IN WALLS AND CEILINGS UNLESS NOTED OTHERWISE. IN FINISHED AREAS WITH INACCESSIBLE WALLS OR CEILINGS, PROVIDE SURFACE (WIREMOLD) RACEWAY; PAINT TO MATCH COLOR OF ADJACENT WALL OR CEILING.
B. RACEWAYS SHALL CONTAIN A GROUNDING CONDUCTOR.
C. CIRCUITS SUPPLYING LINE TO NEUTRAL LOADS SHALL HAVE DEDICATED NEUTRALS, i.e. ONE NEUTRAL PER PHASE. NEUTRAL CONDUCTORS SHALL HAVE TRACER STRIPE ALONG ENTIRE LENGTH INDICATING ASSOCIATED PHASE.
D. BUILDING CONDUCTORS SHALL BE THWN/THHN. CONDUCTORS IN UNDERGROUND CONDUIT OUTSIDE OF BUILDINGS SHALL BE XHHW.
E. NUMBERS AT RECEPTACLES AND LIGHT FIXTURES CORRESPOND DIRECTLY WITH PANELBOARD CIRCUIT NUMBERS AS SCHEDULED. BRANCH CIRCUIT WIRING AND HOMERUNS ARE NOT SHOWN FOR CLARITY. ACCURATE RECORD DRAWING INFORMATION IS TO BE PROVIDED AT THE PROJECT COMPLETION. TYPICAL THROUGHOUT. REFER TO SPECIFICATIONS FOR MATERIALS AND INSTALLATION REQUIREMENTS.
F. REFER TO CONTRACT DOCUMENTS FOR SEQUENCE OF CONSTRUCTION AND PHASING OF THE CONTRACT.
G. SWITCHES SHALL BE MOUNTED PER ADA REQUIREMENTS, 46" AFF. UNLESS OTHERWISE NOTED, RECEPTACLES AND TELECOMMUNICATION OUTLETS IN FINISHED AREAS SHALL BE MOUNTED 18" AFF. RECEPTACLES IN UN-FINISHED SPACES SHALL BE MOUNTED AT 46" OR 4" ABOVE WORK SURFACE. COORDINATE RECEPTACLE MOUNTING HEIGHTS WITH MILLWORK LOCATIONS, ARCHITECTURAL ELEVATIONS, AND MASONRY COURSING.
H. CRITICAL DEVICES / EQUIPMENT, INCLUDING TELEPHONE, COMPUTER, SECURITY, AND FIRE ALARM, AFFECT ASSOCIATED SYSTEMS BUILDING-WIDE. THESE SYSTEMS MUST REMAIN OPERATIONAL DURING THE CONSTRUCTION. INDIVIDUAL DEVICES MAY BE DISCONNECTED AND/OR RECONNECTED DURING CONSTRUCTION. COORDINATE POWER OUTAGES WITH OWNER. PROVIDE TEMPORARY PANEL(S) AND/OR CIRCUIT(S) AS IF NECESSARY TO MAINTAIN CONTINUITY. PROTECT FROM PHYSICAL AND DUST DAMAGE.
I. THE BUILDING SHALL MAINTAIN POWER THROUGHOUT THE CONSTRUCTION PROCESS. COORDINATE ENERGIZATION OF NEW EQUIPMENT AND THE CORRESPONDING RECONNECTION OF EXISTING AFFECTED ELECTRICAL DISTRIBUTION EQUIPMENT.
J. SEE RELATED PLUMBING AND HVAC DRAWINGS FOR LOCATION OF EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS. COORDINATE INTERCONNECTION REQUIREMENTS WITH EQUIPMENT SHOP DRAWINGS.
K. WIRING FOR MISCELLANEOUS HVAC DEVICES AND CONTROLLERS SUCH AS DAMPER MOTORS, THERMOSTATS, DUCT SMOKE DETECTORS, FREEZESTATS, DIFFERENTIAL PRESSURE SWITCHES, OCCUPIED AND UNOCCUPIED SELECTOR SWITCHES, ALARM LIGHTS, ETC., NOT SHOWN ON ELECTRICAL DRAWINGS IS DIVISION 23 WORK.
L. FIELD VERIFY EXISTING CONDITIONS. DISCREPANCIES BETWEEN THE DRAWING AND ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BIDS.
M. MAINTAIN EXISTING CIRCUIT CONTINUITY ON ALL SYSTEMS ON THE SITE THAT ARE EXISTING TO REMAIN.
N. PROVIDE ALL CONDUIT HOMERUNS AS 3/4"C. MIN.
O. COORDINATE ALL WORK WITH OTHER CONTRACTORS AND OWNER.
P. ALL CUTTING AND PATCHING FOR DIV. 26 WORK SHALL BE UNDER SUPERVISION AND APPROVAL OF ARCHITECT.
Q. REMOVE AND/OR REINSTALL ELECTRICAL DEVICES IN ALL AREAS OF WORK AS REQUIRED AND REPLACE ANY ELECTRICAL DEVICES DAMAGED BY WORK. NOT ALL DEVICES MAY BE SHOWN ON DRAWINGS.
R. PROVIDE ALL BOXES, FITTINGS, CONDUIT, WIRING, TERMINATIONS, EQUIPMENT, ETC, FOR A COMPLETE INSTALLATION.
S. BRANCH 20A CIRCUIT CONDUCTORS SHOULD BE SIZED AS FOLLOWS:

120V CCT LENGTH	277V CCT LENGTH	AWG
< 75'	< 130'	12
75' - 120'	130'- 215'	10
120' - 200'	215' - 330'	8

ELECTRICAL DRAWINGS

ELECTRICAL ABBREVIATIONS LIST

<	ANGLE
@	AT
'	FEET
"	INCHES
#	NUMBER
1P	1 POLE (2P, 3P, 4P, ETC.)
A	AMPERE
AC	AIR CONDITIONER
ACLG	ABOVE CEILING
ADA	AUTOMATIC DOOR ACTUATOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT CIRCUIT INTERRUPTER
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPLIFIER
ANNUN	ANNUNCIATOR
AQ-STAT	AQUASTAT
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BD	BOARD
BLDG	BUILDING
BAS	BUILDING AUTOMATION SYSTEM
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
CMPR	COMPRESSOR
CONN	CONNECTION
CONT	CONTINUATION OR CONTINUOUS
CONTR	CONTRACTOR
CONV	CONVECTOR
CP	CIRCULATING PUMP
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
DCP	DOMESTIC WATER CIRCULATING PUMP
EX	EXISTING TO REMAIN
FOL	FIBER OPTIC LINE
FS	FUSIBLE SWITCH
HTR	HEATER
HV	HIGH VOLTAGE
HWP	HYDRONIC WATER PUMP
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
I/W	INTERLOCK WITH
J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KVAR	KILOVOLT-AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LOC	LOCATE OR LOCATION
LT	LIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
MAG.S	MAGNETIC STARTER
M/C	MOMENTARY CONTACT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDC	MAIN DISTRIBUTION CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MFS	MAIN FUSED DISCONNECT SWITCH
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MSP	MOTOR STARTER PANELBOARD
MSBD	MAIN SWITCHBOARD
MT	MOUNT
MT.C	EMPTY CONDUIT
MTS	MANUAL TRANSFER SWITCH
MTR	MOTOR, MOTORIZED
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
NIC	NOT IN CONTRACT
NL	NEW LOCATION
N.O.	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOADS
PA	PUBLIC ADDRESS
PB	PULL BOX
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PROJ	PROJECTION
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (CONDUIT)
PWR	POWER
QUAN	QUANTITY
RCPT	RECEPTACLE
REQD	REQUIRED
RL	RELOCATED
RSC	RIGID STEEL CONDUIT
RTU	ROOF TOP UNIT
SC	SURFACE CONDUIT
SEC	SECONDARY
SHT	SHEET
SIM	SIMILAR
S/N	SOLID NEUTRAL
SPKR	SPEAKER
SP	SPARE
SR	SURFACE RACEWAY
SS	STAINLESS STEEL
SSW	SELECTOR SWITCH
S/S	STOP/START PUSHBUTTONS
STA	STATION
STD	STANDARD
SURF	SURFACE MOUNTED
SW	SWITCH
SWBD	SWITCHBOARD
SYM	SYMMETRICAL
TERM	TERMINAL
TL	TWIST LOCK
TR	TAMPER RESISTANT
T-STAT	THERMOSTAT
TTC	TELEPHONE TERMINAL CABINET
TVTC	TELEVISION TERMINAL CABINET
TYP	TYPICAL
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
US	UNDERGROUND SYSTEMS
UT	UNDERGROUND TELEPHONE
UV	UNIT VENTILATOR OR ULTRAVIOLET
V	VOLT
VA	VOLT-AMPERES
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	WATT
W/	WITH
WG	WIRE GUARD
WH	WATER HEATER
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER
XFR	TRANSFER

DEVICE ABBREVIATIONS:

WASH	CLOTHES WASHER
DRY	CLOTHES DRYER
DISH	DISHWASHER
DISP	UNDER SINK DISPOSER
EWC	ELECTRIC WATER COOLER
FLSH	SANITARY AUTOMATIC FLUSH
FRZ	FREEZER
GOGG	GOGGLES CABINET
HAND	HAND DRYER
HOOD	EXHAUST HOOD
MWV	MICROWAVE
REF	REFRIGERATOR
RL	RELOCATE
NL	NEW LOCATION
OVN	ELECTRIC OVEN
VEND	VENDING MACHINE
PRNT	PRINTER

Version 08.13.18

MN

E

LIFT STATION GENERATOR ENCLOSURE

Wood St.,
Wrangell, AK 99929

City of Wrangell
Wood St, Wrangell, AK 99929

Wold

WOLD ARCHITECTS AND ENGINEERS
332 Minnesota Street, Suite W2000
Saint Paul, MN 55101
woldae.com | 651 227 7773

STATE OF ALASKA 49TH SITHA CHHUM No. EE129997 REGISTERED ELECTRICAL ENGINEER

Revisions		
Description	Date	Num
Addendum 1	03/10/2022	4

Comm: 216054
Date: 01/25/22
Drawn: GE
Check: SC

ELECTRICAL SYMBOLS AND ABBREVIATIONS

Scale: As indicated

E0.00

LIFT STATION GENERATOR ENCLOSURE

Wood St.,
Wrangell, AK 99929

City of Wrangell
Wood St, Wrangell, AK 99929

WOLD ARCHITECTS AND ENGINEERS
332 Minnesota Street, Suite W2000
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MN

GENERAL SHEET NOTES

A. ALL LIGHTING AND POWER CONDUCTORS SHALL BE INSTALLED BETWEEN 24" (MINIMUM) AND 36" (MAXIMUM) BELOW FINISHED GRADE.

B. ALL COMMUNICATIONS CONDUIT AND CABLES SHALL BE INSTALLED 36" (MINIMUM) BELOW FINISHED GRADE.

C. ALL UNDERGROUND CIRCUITS SHALL BE #10 AWG MINIMUM IN 1" PVC-80 CONDUIT.

D. PROVIDE PULL WIRE IN ALL EMPTY CONDUITS.

E. PROVIDE DETECTABLE UNDEGROUND TAPE ABOVE EACH UNDERGROUND CONDUIT.

F. HANDHOLES AND PULLBOXES MAY NOT BE INDICATED ON PLANS. PROVIDE AS REQUIRED FOR INSTALLATION.

KEYED POWER & SYSTEMS NOTES

1. PROPOSED ROUTING OF UNDERGROUND ELECTRIC LINES. COORDINATE WITH EXISTING UNDERGROUND UTILITIES.
2. PROVIDE GFI WP DOUBLE DUPLEX RECEPTACLE WITH IN USE COVER NEXT TO LIGHT SWITCHES. CONNECT TO SAME 120V CIRCUIT AS LIGHTING.
3. PROVIDE (4) ENCLOSED AND GASKETED LUMINAIRES CONTROLLED BY LIGHT SWITCH. LITHONIA FEM-L48-3000L-AMAFL-WD-MVOLT-GZ10-40K-80CRI OR APPROVED EQUAL.
4. EXISTING MONUMENT SIGN. FIELD LOCATE ELECTRICAL CONNECTIONS AND PROTECT DURING SITE WORK. IF UNABLE TO MAINTAIN EXISTING LOCATION, PROVIDE HANDHOLE AND SPLICE/EXTEND WIRING AS REQUIRED.
5. PROVIDE 3-INCH EXHAUST PIPE FOR GENERATOR AND ROUTE ABOVE EXHAUST LOUVER. EXTEND SLIGHTLY PASS ROOF OVERHANG.
6. PROVIDE 22" x 22" DUCT FOR EXHAUST.
7. PROVIDE (1) LITHONIA WST LED SERIES. LITHONIA WST-LED-P2-40K-VF-MVOLT. LIGHT CONTROLLED BY ANOTHER WALL SWITCH.

D2 PARTIAL SITE PLAN
NOT TO SCALE

GENERAL NOTES:

A. PROVIDE COPPER CONDUCTORS UNLESS OTHERWISE NOTED.

B. PROVIDE XHHW INSULATION FOR UNDERGROUND CONDUCTORS.

C. PROVIDE GALVANIZED RIGID STEEL CONDUIT FOR EXPOSED EXTERIOR CONDUITS.

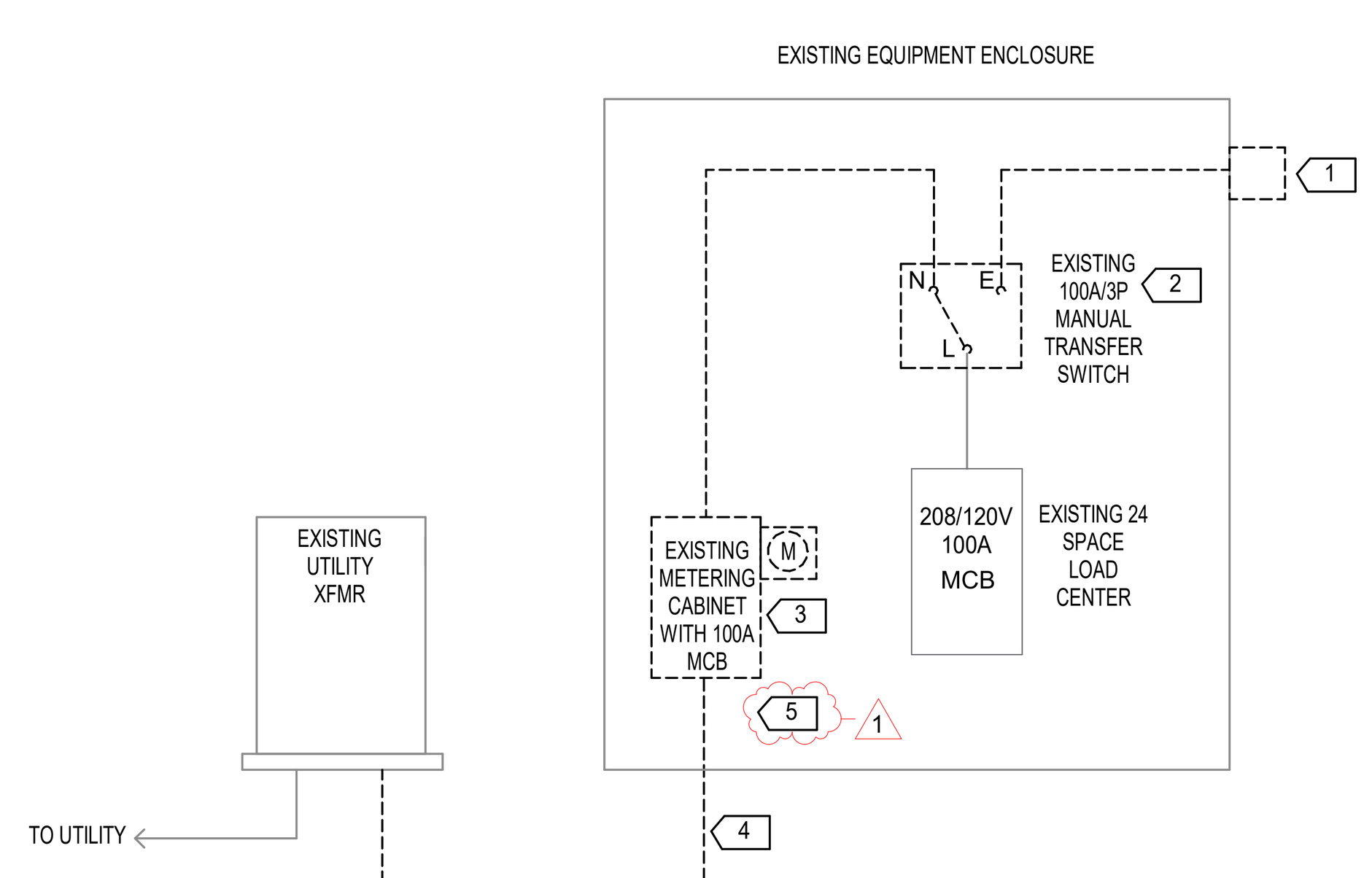
D. PROVIDE CONCRETE PAD FOR FLOOR-MOUNTED EQUIPMENT. EXTEND PAD 4" PAST FOOTPRINT OF EQUIPMENT.

DEMOLITION KEYED NOTES:

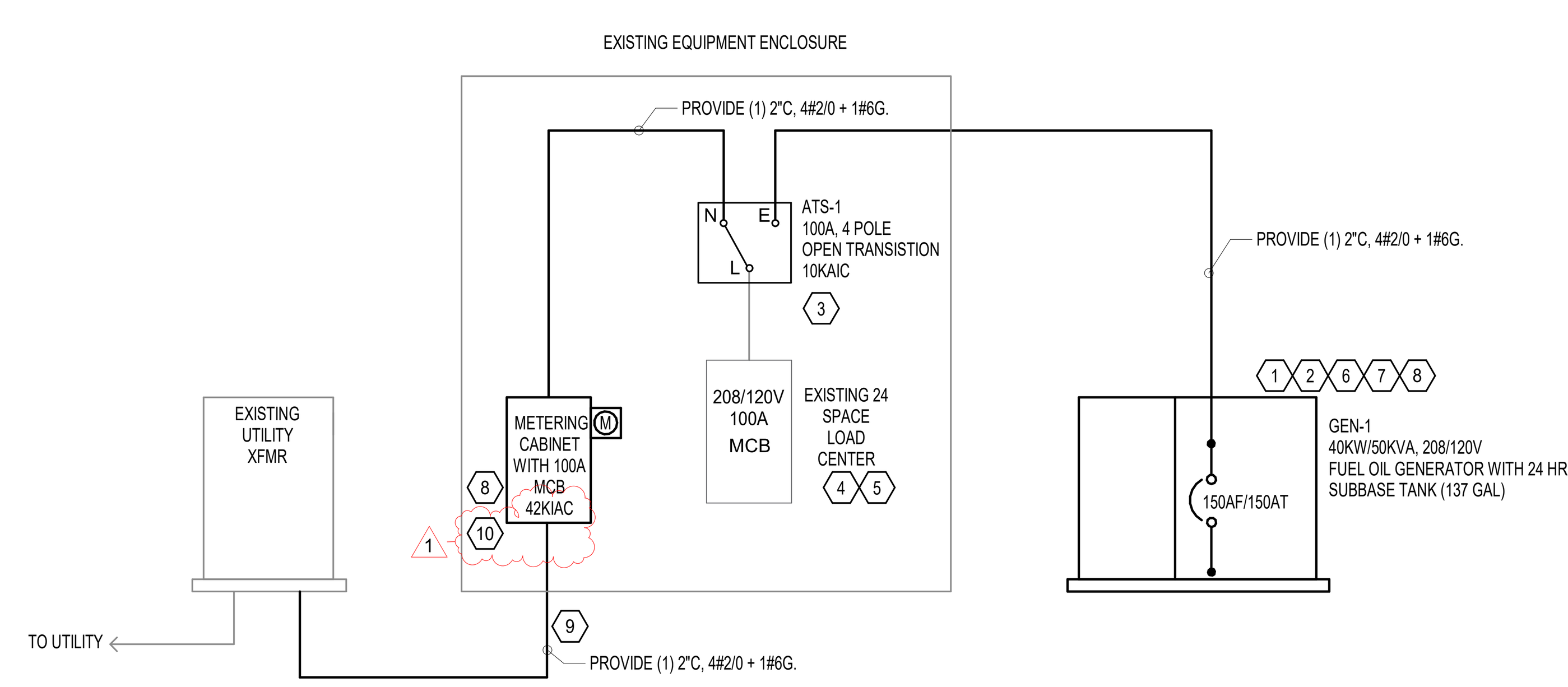
1. REMOVE EXISTING GENERATOR RECEPTACLE BACK TO MANUAL TRANSFER SWITCH. TURN OVER RECEPTACLE TO OWNER.
2. REMOVE EXISTING 100A MANUAL TRANSFER SWITCH AND TURN OVER TO OWNER. PREPARE NORMAL LINE AND LOAD CIRCUITRY FOR REUSE. DEMOLISH SWITCH AFTER PERMANENT GENERATOR HAS BEEN SET TO MINIMIZE OUTAGE.
3. REMOVE EXISTING COMBINATION METER SOCKET/SERVICE DISCONNECT AND TURN OVER TO OWNER.
4. PREPARE EXISTING SERVICE LATERAL STUB-UP FOR EXTENSION. EXTEND CONDUIT TO BACKSIDE OF ENCLOSURE. CUT AND DRILL EXISTING ENCLOSURE TO ACCOMMODATE NEW ROUTE. SEAL AND PAINT ALL EXPOSED METAL AS REQUIRED.
5. REMOVE EXISTING RECEPTACLE AND PREPARE CIRCUIT FOR REINSTALLATION OF RECEPTACLE BELOW THE PANEL.

REMODELLED KEYED NOTES:

1. GENERATOR FURNISHED BY OWNER, INSTALLED BY ELECTRICAL.
2. GENERATOR TO BE A SEPERATELY DERIVED SYSTEM. PROVIDE 1/2" X 10' COPPER CLAD GROUND ROD AT OPPOSITE CORNERS OF CONCRETE PAD. EXOTHERMIC WELD #3/0 COPPER GROUND CONNECTION TO GENERATOR AT EACH GROUND ROD. PROVIDE ADDITIONAL GROUND RODS AS REQUIRED TO OBTAIN 25 OHMS GROUND RESISTANCE.
3. INSTALL OWNER FURNISHED AUTOMATIC TRANSFER SWITCH. ATS TO FIT IN SAME LOCATION AS DEMOLISHED MANUAL TRANSFER SWITCH APPROXIMATELY 18"W x 32"H X 13"D MAX. FIELD VERIFY EXACT DIMENSIONS OF EXISTING EQUIPMENT ENCLOSURE AND MODIFY LINE AND LOAD SIDE CONNECTIONS AS REQUIRED.
4. PROVIDE 40A/1P BREAKER AND (1) 1.5"C, 2#4 + 1#8G TO GENERATOR SINGLE POINT CONNECTION. GENERATOR ACCESSORIES ARE FACTORY WIRED TO THE SINGLE POINT CONNECTION.
5. PROVIDE (1) 20A/1P BREAKERS AND (1) 1"C, 2#10 +1#10G TO GENERATOR SHED FOR LIGHTING AND POWER.
6. INSTALL OWNER FURNISHED GENERATOR REMOTE SHUT-OFF ON INSIDE OF SHED. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO ROUGH-IN.
7. OUTPUT OF GENERATOR CONTROLLER TO BE INTERCONNECTED TO EXISTING SCADA INPUTS IN EQUIPMENT ENCLOSURE FOR ALARM. PROVIDE EMPTY (2) 1" CONDUIT FOR USE BY OWNER'S SCADA VENDOR. ROUTE FROM GENERATOR AND STUB INTO EQUIPMENT ENCLOSURE.
8. PROVIDE NEMA 3R COMBINATION METERING CABINET WITH SERVICE DISCONNECT ON BACKSIDE OF ENCLOSURE. COORDINATE ALL REQUIREMENTS WITH UTILITY COMPANY.
9. EXTEND EXISTING CONDUIT AND PROVIDE WIRING TO NEW LOCATION OF METERING CABINET. FIELD VERIFY EXACT LENGTH AND REVISE WIRING AS REQUIRED TO ACCOMODATE EXISTING CONDITIONS.
10. PROVIDE WP GFCI RECEPTACLE MOUNTED TO UNDERSIDE OF PANEL. EXTEND AND SPLICE CIRCUIT TO NEW LOCATION.



F1 PARTIAL RISER DIAGRAM-EXISTING
NOT TO SCALE



F3 PARTIAL RISER DIAGRAM - REMODELLED
NOT TO SCALE

E

Revisions		
Description	Date	Num
Addendum 1	03/10/2022	1

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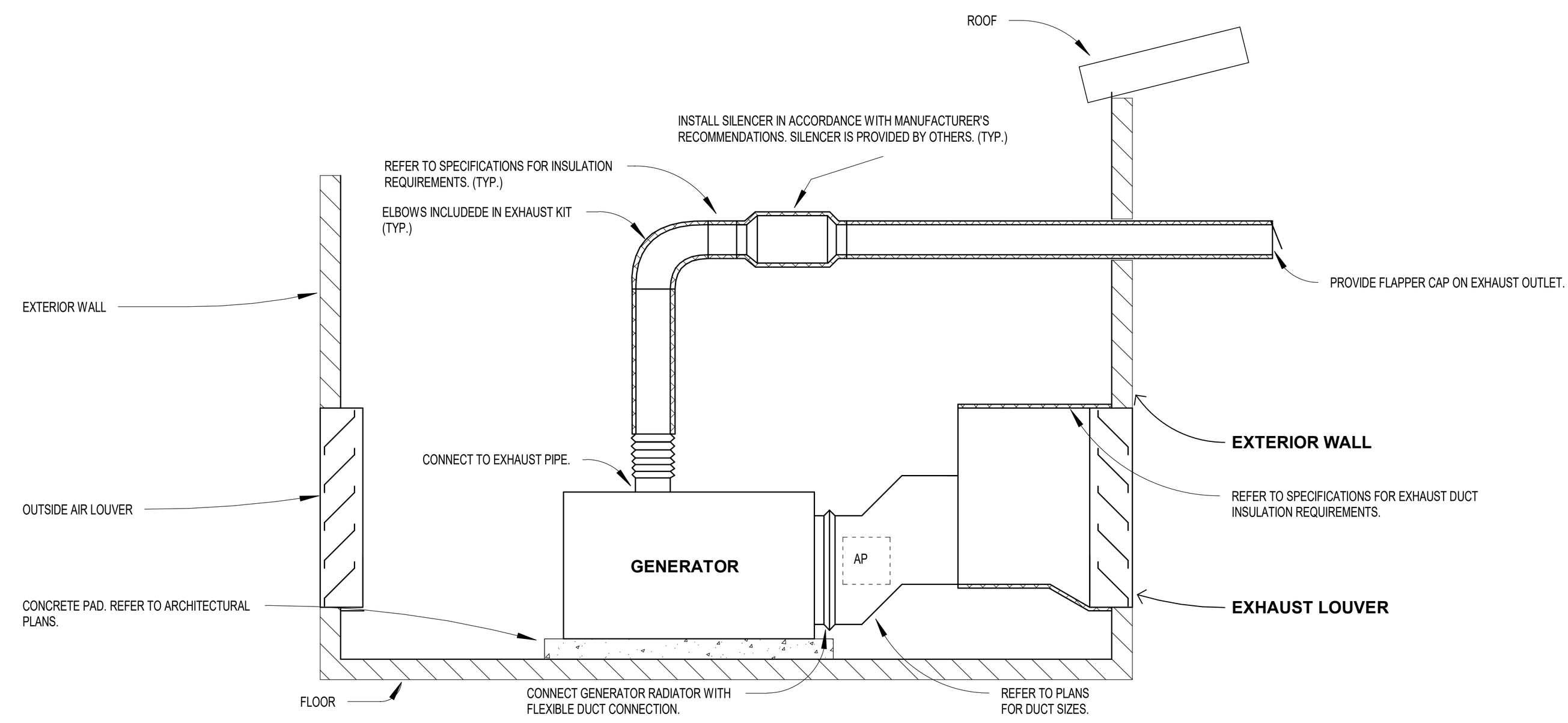
Date: 01/25/22
Drawn: GE
Check: SC

ELECTRICAL PLANS AND RISER DIAGRAM

Scale: As indicated

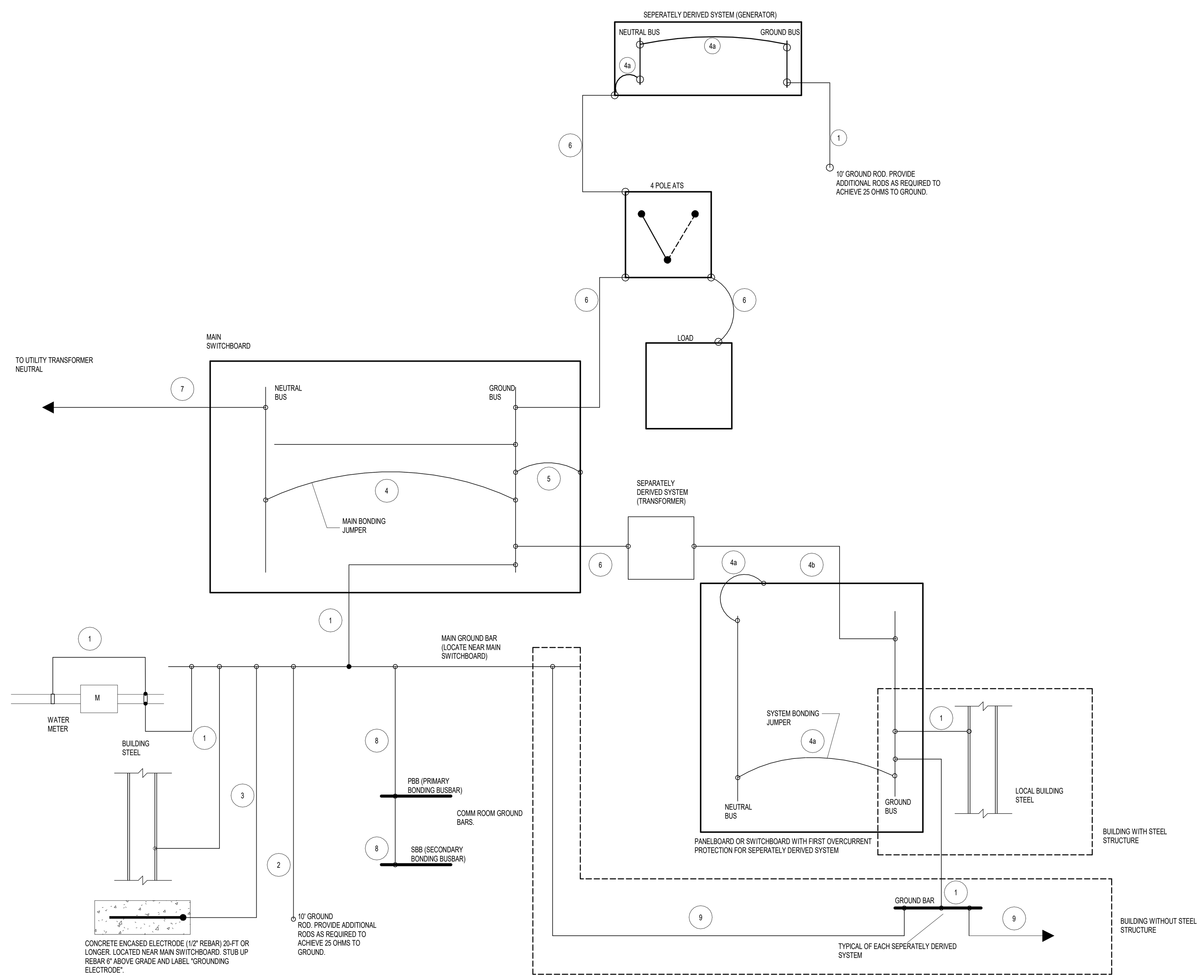
E8.00

MN



NOTE:
- INSTALL AS REQUIRED PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
- GENERATOR IS PROVIDED BY ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION AS REQUIRED.
- REFER TO PLANS FOR PIPE SIZE AND ROUTING.

B2 GENERATOR DETAIL
NOT TO SCALE

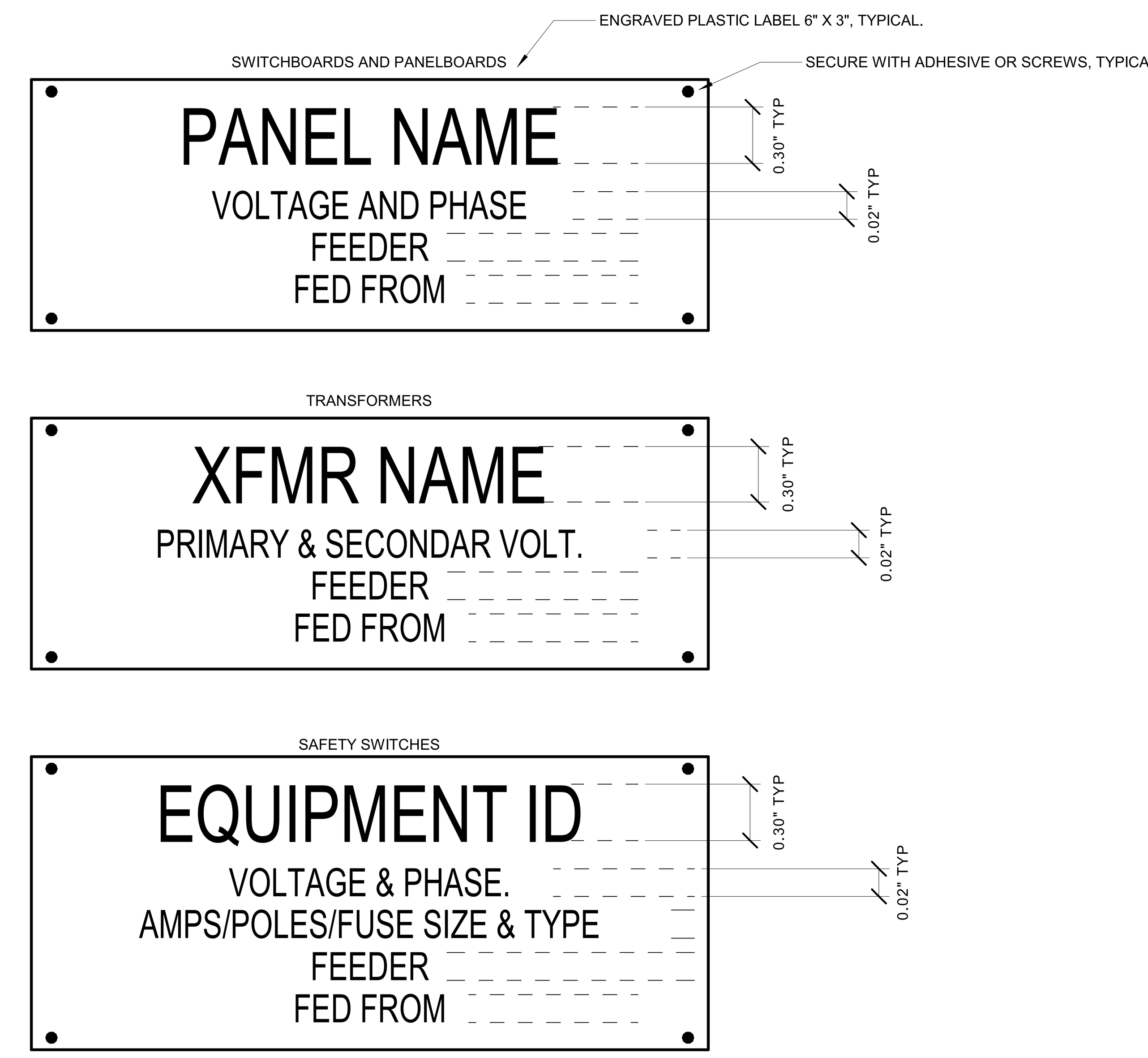


GROUNDING AND BONDING TABLE

LEAD NO. (X)	DESCRIPTION	SIZE	TYPE	REMARKS
1	GROUNDING ELECTRODE CONDUCTOR	PER NEC 250.66/TABLE 250.66	BARE OR INSUL. COPPER	
2	GROUNDING ELECTRODE CONDUCTOR, CONNECT TO ROD, PIPE, OR PLATE ELECTRODE	PER NEC 250.66 (#6 AWG)	BARE COPPER	
3	CONCRETE ENCASED ELECTRODE	PER NEC 250.66 (#4 AWG)	BARE COPPER	
4	MAIN BONDING JUMPER	PER NEC 250.28/TABLE 250.102(C)(1)	BARE COPPER	
4a	SYSTEM BONDING JUMPER	PER NEC 250.28/TABLE 250.102(C)(1)	BARE COPPER	
4b	SUPPLY-SIDE BONDING JUMPER	PER NEC 250.28/TABLE 250.30	INSULATED COPPER	
5	EQUIPMENT BONDING JUMPER	PER NEC 250.102	BARE COPPER	
6	EQUIPMENT GROUNDING CONDUCTOR	PER NEC 250.122/TABLE 250.122	INSULATED COPPER	
7	GROUNDED SERVICE CONDUCTOR (NEUTRAL)	SEE RISER DIAGRAM	INSULATED COPPER	
8	COMMUNICATION ROOM TELECOM BONDING BACKBONE	PER ANSI/TIA 607-C (MIN #6 AWG)	INSULATED COPPER	
9	COMMON GROUNDING ELECTRODE CONDUCTOR	PER NEC 250.30 (MIN #3 AWG)	INSULATED COPPER	

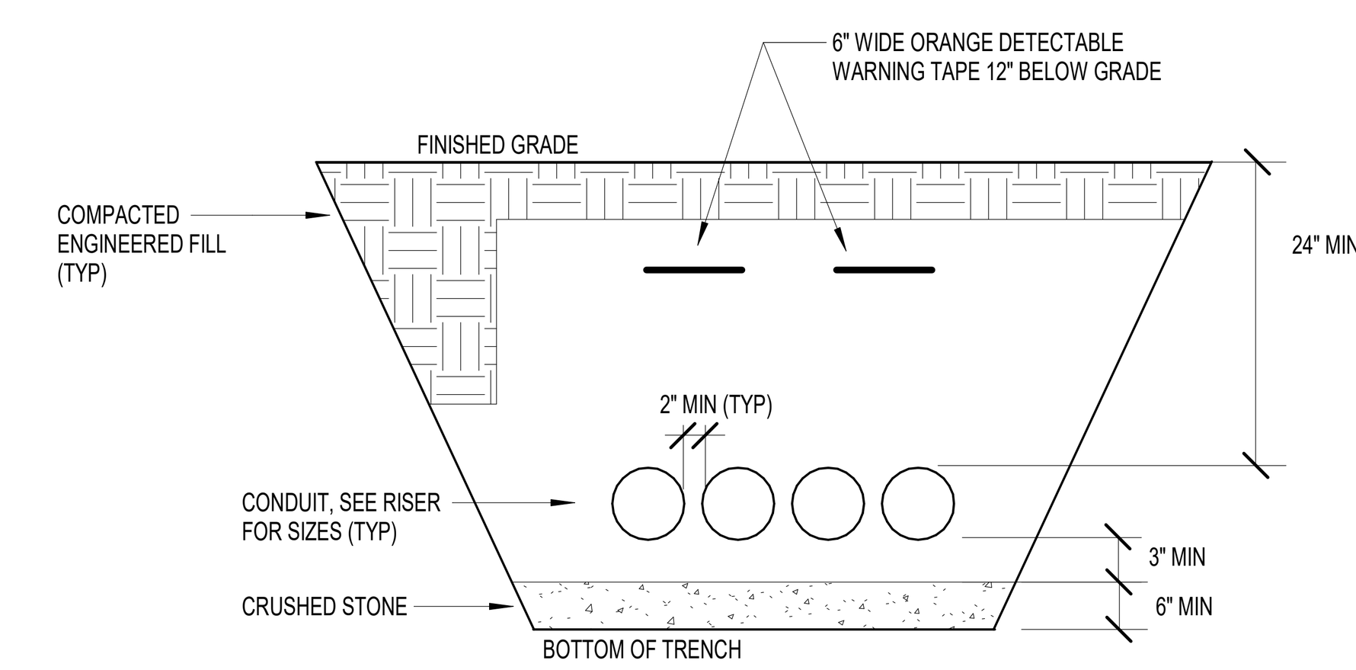
NOTES: 1. SEE DETAIL SHEETS FOR ADDITIONAL INFORMATION ON GROUND BUSSES.

F2 GROUNDING DETAIL
NOT TO SCALE



NOTE
A. PROVIDE LABELS FOR ALL ELECTRICAL EQUIPMENTS BEING INSTALLED, INCLUDING SWITCHBOARDS, PANELBOARDS, SAFTEY SWITCHES, TRANSFORMERS, ETC.
B. FEEDER TO BE IN THE FOLLOWING FORM: (1) 1/2"C, 2#12+1#12G.
C. PROVIDE WHITE LETTERS ON BLACK BACKGROUND FOR EQUIPMENT ON NORMAL POWER.
D. PROVIDE WHITE LETTERS ON RED BACKGROUND FOR EQUIPMENT ON EMERGENCY POWER.
E. VERIFY ACCURACY OF ALL INFORMATION WITH ENGINEER PRIOR TO FABRICATION.

C6 EQUIPMENT LABELS
NOT TO SCALE



NOTES:
1. PROVIDE PULL LINE IN EACH SPARE CONDUIT.

2. PROVIDE WUNPEECE DUCT SPACERS WITH 2" SPACING BETWEEN CONDUITS. PROVIDE 6' O.C. TO MAINTAIN CONDUIT SPACING, BEGINNING 1'-0" FROM END OF DUCT.

3. MAINTAIN MINIMUM OF 12" CLEARANCE FROM OTHER UTILITIES (WATER, FIRE, COMMUNICATION, ETC) THAT ARE LOCATED IN THE SAME TRENCH.

4. SEE RISER DIAGRAMS FOR QUANTITIES ADN SIZES OF EACH CONDUIT.

F6 UNDERGROUND CONDUIT DETAIL
NOT TO SCALE

E

LIFT STATION GENERATOR ENCLOSURE
Wood St.,
Wrangell, AK 99929

City of Wrangell
Wood St, Wrangell, AK 99929

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STATE OF ALASKA
49TH
SITHA CHHUM
No. EE129597
REGISTERED ELECTRICAL ENGINEER

Revisions		
Description	Date	Num
Addendum 1	03/10/2022	1

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ELECTRICAL DETAILS

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