TOWN OF GLASTONBURY

INVITATION TO BID

BID #	ITEM	DATE & TIME REQUIRED
GL-2016-23	Generator Replacement Glastonbury Police/Fire Department	June 30, 2016 @ 11:00 a.m.

The Town of Glastonbury is seeking bids for the replacement of an emergency generator and the relocation of an emergency generator and associated equipment at the Glastonbury Police Department, 2108 Main Street, and Fire Company #1, 2825 Main St, Glastonbury, CT 06033

A mandatory pre-bid meeting and site walk through will be held starting at the Glastonbury Police Department, 2108 Main Street, Glastonbury, CT 06033 on Tuesday, June 14, 2016 at 10:00 a.m. All bidders must attend in order for their bid to be considered.

Bid Forms may be downloaded from the Town's website at www.glastonbury-ct.gov at no cost. Forms are also available at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, Connecticut 06033, (second level).

Prevailing Wages: The contractor must comply with Section 31-53 of the Connecticut General Statutes as amended, including annual adjustments in prevailing wages.

Bid Security shall be issued payable to the "Town of Glastonbury" in the form of a certified check or Bid Bond in an amount not less than 10% of the total amount of the base bid. The Bid Bond must be issued by a surety company licensed in the State of Connecticut. Cashier's checks will not be accepted.

The Town reserves the right to waive informalities or reject any part of, or the entire bid, when said action is deemed to be in the best interest of the Town. All Sealed Bids must be submitted to the Office of the Purchasing Agent no later than the time and date indicated. All bids will be publicly opened and read.

The Town of Glastonbury is an Affirmative Action/Equal Opportunity Employer.
Minority/Women/Disadvantaged Business Enterprises are encouraged to bid.

Mary F. Visone
Purchasing Agent

TABLE OF CONTENTS SECTION

1. Sealed bids **(one original and one copy)** on the attached Bid Forms will be received at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, Connecticut, 06033 (second level). At the designated time of opening, they will be publicly opened, read, recorded and placed on file.

2. Whenever it is deemed to be in the best interest of the Town, the Town Manager, Purchasing Agent or designated representative shall waive informalities in any and all bids. The right is reserved to reject any bid, or any part of any bid, when such action is deemed to be in the best interest of the Town of Glastonbury.

3. The basis of award will be based on the lump sum bid of the lowest qualified and responsible bidder. While it is the intent of the Town to contract with one vendor, the Town reserves the right to award to more than one vendor as deemed in the best interest of the Town.

4. Bids will be carefully evaluated as to conformance with stated specifications.

5. The envelope enclosing your bid should be clearly marked by your company name and address, bid number, time of bid opening, and date.

6. Specifications must be submitted complete in every detail and, when requested, samples shall be provided. If a bid involves any exception from stated specifications, they must be clearly noted as exceptions, underlined, and attached to the bid.

7. The Bid Documents contain the provisions required for the requested item. Information obtained from an officer, agent, or employee of the Town or any other person shall not affect the risks or obligations assumed by the Bidder or relieve him/her from fulfilling any of the conditions of the bid.

8. Each Bidder is held responsible for the examination and/or to have acquainted themselves with any conditions at the job site which would affect their work before submitting a bid. Failure to meet these criteria shall not relieve the Bidder of the responsibility of completing the bid without extra cost to the Town of Glastonbury.

9. Any bid may be withdrawn prior to the above-scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and the date specified shall not be considered. No bidder may withdraw a bid within sixty (60) days after the actual date of the opening thereof. Should there be reasons why a bid cannot be awarded within the specified period, the time may be extended by mutual agreement between the Town and the Bidder.

10. Each bid must be accompanied by a bid bond payable to the Town for ten percent (10%) of the total amount of the bid. The bid bond of the successful bidder will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a bid bond. The Town of Glastonbury will not be liable for the accrual of any interest on any certified check submitted. Cashier's checks will not be accepted.

11. A 100% Performance and Payment bond is required of the successful bidder. This bond shall cover all aspects of the specification and shall be delivered to the Purchasing Agent prior to the issuance of a purchase order. The Performance and Payment Bond will be returned upon the delivery and acceptance of the bid items.

12. The Bidder agrees and warrants that in the submission of this sealed Bid, they will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religion, national origin, sex, or physical disability including, but not limited to blindness, unless it is shown by such Bidder that such disability prevents performance of that which must be done to successfully fulfill the terms of this sealed Bid or in any manner which is prohibited by the laws of the United States or the State of Connecticut: and further agrees to provide the Human Relations Commission with such information requested by the Commission concerning the employment practices and procedures of the Bidder. An Affirmative Action Statement will be required by the successful Bidder.

13. Bidder agrees to comply with all of the latest Federal and State Safety Standards and Regulations and certifies that all work required in this bid will conform to and comply with said standards and regulations. Bidder further agrees to indemnify and hold harmless the Town for all damages assessed against the Town as a result of Bidder's failure to comply with said standards and/or regulations.

14. All correspondence regarding any purchase made by the Town of Glastonbury shall reference the Town purchase order number. Each shipping container shall clearly indicate both purchase order number and item number.

15. Bidder is required to review the Town of Glastonbury Code of Ethics adopted July 8th, 2003 and effective August 1, 2003 and revised October 29, 2013 and effective November 28, 2013. Bidder shall acknowledge that they have reviewed the document in the area provided on the bid / proposal response page (BP). The selected Bidder will also be required to complete and sign an Acknowledgement Form prior to award. The Code of Ethics and the Consultant Acknowledgement Form can be accessed at the Town of Glastonbury website at **www.glastonbury-ct.gov.** Upon entering the website click on **Bids & Proposals Icon**, which will bring you to the links for the **Code of Ethics** and the **Acknowledgement Form**. If the Bidder does not have access to the internet a copy of these documents can be obtained through the Purchasing Department at the address listed within this bid / proposal.

16. Any bidder, in order to be considered, shall be engaged primarily in the business of construction with for minimum of five (5) years, prior experience with generator replacements and have a valid contractor's license in the State of Connecticut.

17. **Non-Resident Contractors (IF APPLICABLE):Resident Contractors:**

    Upon award the Town is required to report names of nonresident (out of state) Contractors to the State of Connecticut, Department of Revenue Services (DRS) to ensure that Employment Taxes and other applicable taxes are being paid by Contractors. **A single surety bond for 5% of the entire contract price is required to be filed with DRS by any unverified nonresident prime or general contractor (if awarded) where the contract price for the project is $250,000 or more.** The contractor will be required to promptly furnish to the Town a copy of the **Form AU-968 - Certificate of Compliance** issued by the State of Connecticut, DRS. See State of Connecticut **Notice SN 2012 (2)**.

18. Bidder shall include on a sheet(s) attached to its proposal a complete disclosure of all past and pending mediation, arbitration and litigation cases that the bidder or its principals (regardless of their place of employment) have been involved in for the most recent five years. Please include a

statement of the issues in dispute and their resolution. Acceptability of Bidder based upon this disclosure shall lie solely with the Town.

19. Bidder or its principals, regardless of their place of employment, shall not have been convicted of, nor entered any plea of guilty, or nolo contendere, or otherwise have been found civilly liable or criminally responsible for any criminal offense or civil action. Bidder shall not be in violation of any State or local ethics standards or other offenses arising out of the submission of bids or proposals, or performance of work on public works projects or contracts.

20. After award of Contract, Owner will require the Contractor's Schedule of Values, which shall be submitted at the preconstruction meeting. The Schedule of Values must accurately reflect job costs and include a complete breakdown of material and labor costs.

21. Prevailing Wage Rates:

    Bidders shall comply with State Statutes concerning Employment and Labor Practices, if applicable, and Section 31-53 of the Connecticut General Statutes, as amended (Prevailing Wages). Wage Rate Determination for this project from the State of Connecticut is included in the Bid Documents. Certified payrolls for site labor shall be submitted weekly to the Town's Representative or his designee on the correct State of Connecticut form. The Town reserves the right to, without prior notice, audit payroll checks given to workers on site in order to ascertain that wages and fringe benefits are being paid as required by the State of Connecticut. Please make special note of the State requirement to adjust wage and fringe benefit rates on each July 1st following the original published rates.

    NOTE that bidder is to include in its bid proposal all costs required by such annual increases in the PREVAILING RATES. No Escalation Clauses are to be included in the bidder's proposal and no Escalation Clauses will be in the Contract Agreement. Bidder is to anticipate any future increases and include these costs in its quotation.

    Contractor's invoices will not be paid if certified payrolls are incomplete, incorrect or not received in a timely manner.

    All Apprentices must be registered with the State of Connecticut and their number shall not exceed the number allowed by law. Otherwise, all workers must be paid at least the Journeyman rate listed including benefits.

    OSHA SAFETY AND HEALTH CERTIFICATION: Effective July 1, 2009: Any Mechanic, Laborer, or Worker, who performs work in a classification listed on the prevailing wage rate schedule on any public works project covered under C.G.S. Section 31-53, both on site and on or in the public building, must have completed a federal OSHA Safety and Health course within the last 5 years.

22. Each Bidder shall submit a list of similar projects completed within the last three years. In order to be eligible for consideration, the Bidder must have successfully completed a minimum of five (5) similar projects within the last three (3) years. Please provide project name and contact information for project coordinator (name, title, address, phone number). Please also provide contract value.

23. For technical questions regarding this Bid, please contact David Sacchitella, Building Superintendent, at (860) 652-7706, email dave.sacchitella@glastonbury-ct.gov. For administrative questions regarding this Bid, please contact Mary F. Visone, Purchasing Agent at (860) 652-7588, email purchasing@glastonbury-ct.gov . The request must be received at least three (3) business days prior to the advertised response deadline. All questions, answers, and/or addenda, as applicable, will be posted on the Town's website at www.glastonbury-ct.gov (Upon entering the website click on Bids & Proposals Icon; click the Bid Title to view all bid details and document links). It is the respondent's responsibility to check the website for addenda prior to submission of any proposal.

IMPORTANT:

- Failure to comply with general rules may result in disqualification of the Bidder.
- Municipal projects are exempt from Federal Excise Taxes, as well as, State of Connecticut Sales, Use and Service Taxes and should not be include in the Bidder's proposal.

01.00 WORKMANSHIP, MATERIALS AND EMPLOYEES

01.01 Wherever in this contract the word "Engineer" is used, it shall be understood as referring to the Building Superintendent of the Town of Glastonbury acting personally or through any assistants duly authorized.

01.02 The entire work described herein shall be completed in accordance with the plans and specifications to the full intent and meaning of the same. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and material shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

01.03 The wording "furnish", "install", "construct", "furnish and install", or any similar terms, unless specifically noted to the contrary, shall include all labor, materials, water, tools, equipment, light, power, transportation, and any other services required for the completion of the work.

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

02.00 SUPERINTENDENT

02.01 The Contractor shall keep on the work during its progress, in the absence of the Contractor, a competent Superintendent. The Superintendent shall be acceptable to the Engineer and shall fully represent the Contractor. All directions given to the Superintendent shall be binding as if given to the Contractor.

03.00 PRECONSTRUCTION MEETING

03.01 A Preconstruction Meeting will be held with the Engineer, Contractor, and any other interested parties prior to commencing any work. The Engineer shall arrange the meeting based on a mutually convenient time.

04.00 PERMITS

04.01 All permits, licenses, and fees required for the performance of the Contract work shall be secured and paid for by the Contractor. The local building permit fees will be waived.

05.00 PROPERTY ACCESS

05.01 The Contractor shall take all proper precautions to protect from injury or unnecessary interference, and provide proper means of access to abutting property where the existing access is cut off by the Contractor.

05.02 The Contractor shall take all proper precautions to protect persons from injury or unnecessary inconvenience and leave an unobstructed way along the public and private places for travelers, vehicles, and access to hydrants.

05.03 The Contractor shall make arrangements with the adjacent property owners for such trespass as he may reasonably anticipate in the performance of the work. All such arrangements shall be reported, in writing, to the Engineer.

06.00 PROTECTION OF THE PUBLIC AND OF WORK AND PROPERTY

06.01 The Contractor shall continuously maintain adequate protection of all work from damage, and shall take all reasonable precautions to protect the Town from injury or loss arising in connection with the Contract.

06.02 The Contractor shall adequately protect adjacent private and public property as provided by law and the Contract Documents.

06.03 The Contractor shall make good any damage, injury, or loss of work and to the property of the Town resulting from lack of reasonable protective precautions.

06.04 The Police and Fire buildings involved will be occupied during the work and fully operational. The Contractor may be required to adjust his work schedule should the work have an adverse impact on operations. There will be no modification of the bid price should a schedule adjustment be required. Any required shut downs will be closely coordinated with Police and Fire operations and shall be minimized to the extent possible.

07.00 EXISTING IMPROVEMENTS

07.01 The Contractor shall conduct his work so as to minimize damage to existing improvements designated to remain. Except where specifically stated otherwise in the specifications, drawings, or as directed by the Engineer, it will be the responsibility of the Contractor to restore to their original condition, as near as practical, all improvements on public or private property. This shall include:

a. Property within and adjacent to the work area such as shrubs, walks, driveways, fences, etc.

b. Utility mains, ducts, poles, and services. The Contractor is hereby notified that utilities, if/where shown on the plans, are at approximate locations. These locations are subject to possible errors in the source of information and errors in transcription. The Contractor shall make certain of the exact location of all mains, ducts, poles, and services prior to excavation.

08.00 SEPARATE CONTRACTS

08.01 The Engineer reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs. Wherever work being done by the Town of Glastonbury forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Engineer to secure the completion of the various portions of the work.

09.00 INSPECTION OF WORK

09.01 The Town shall provide sufficient personnel for the inspection of the work.

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

09.03 If the specifications or the Engineer's instructions require any work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection and, if the inspection is by another authority other than the Engineer, of the date fixed for such inspection. Inspections by the Engineer shall be made promptly. If any work should be covered up without approval or consent of the Engineer, it must, if required by the Engineer, be uncovered for examination and properly restored at the Contractor's expense.

09.04 Re-inspection of any work may be ordered by the Engineer. If such work is found to be in accordance with the Contract Documents, the Town shall pay the cost of re-inspection and replacement. If such work is not in accordance with the Contract Documents, the Contractor shall pay such cost.

10.00 RIGHT TO INCREASE OR DECREASE WORK

10.01 The Town shall have the right to increase or decrease the amount of work herein specified as may be required.

11.00 RIGHT OF ENGINEER TO STOP WORK FOR WEATHER CONDITIONS

11.01 Should the work, in the opinion of the Engineer, be in danger by reason of inclemency of weather, or could not be finished in time to prevent such danger, the Contractor shall cease operations upon order of the Engineer, and shall not resume them until ordered to do so by the Engineer when the weather conditions are favorable. The Contractor shall, upon such orders, discontinue work, remove all materials or appliances for or in use upon the work, and place the premises in proper condition for use by the public during the time the work is suspended as herein provided, without cost to the Town.

12.00 CONTRACTOR TO BE RESPONSIBLE FOR IMPERFECT WORK OR MATERIALS

12.01 Any faithful work or imperfect material that may be discovered before the acceptance and the payment of the work shall be corrected upon the order of the Engineer. The acceptance and payment of the work does not in any manner relieve the Contractor of his obligation to construct work in the proper manner and the use of materials herein specified.

13.00 TOWN MAY NOTIFY CONTRACTOR IF WORK IS NOT CARRIED ON SATISFACTORILY

13.01 If, in the opinion of the Engineer, the Contractor is not proceeding with the work at a sufficient rate of progress so as to finish in the time specified, or has abandoned said work, or is not complying with the terms and stipulations or the Contract and specifications, the Engineer may serve notice on the Contractor to adopt such methods as will ensure the completion of the work in the time specified.

13.02 If, within five days after the Engineer has notified the Contractor that his work is not being carried on satisfactorily as before mentioned, the Engineer shall have the right to annul the Contract and manage the work under the direction of the Engineer, or re-let, for the very best interest of the Town as a new contract, the work under said new Contract shall be considered the responsibility of the defaulting Contractor.

13.03 Additional costs incurred over and above the original Contract shall be borne by the Performance Bond.

14.00 DEDUCTIONS FOR UNCORRECTED WORK

14.01 If the Engineer deems it inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made there for.

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

14.03 If the Contractor does not remove such condemned work and materials as promptly as possible after written notice, the Engineer may remove them and store the materials at the expense of the Contractor.

15.00 CLEANING UP

15.01 The Contractor must remove all debris of every description as the work progresses and leave the surroundings in a neat and orderly condition to the satisfaction of the Engineer.

15.02 Upon completion, and before acceptance and final payment, the Contractor shall remove from the site all equipment, forms, surplus material, rubbish and miscellaneous debris and leave the site in a neat and presentable condition.

16.00 ROYALTIES AND PATENTS

16.01 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Town of Glastonbury harmless from loss on account hereof, except that the Town of Glastonbury shall be responsible for all such loss when a particular manufacturer, product, or process is specified by the Town of Glastonbury.

17.00 ERRORS OR CONFLICT IN DRAWINGS AND SPECIFICATIONS

17.01 The Contractor shall immediately notify the Owner/Engineer should he find any errors or conflicts in the contract documents. The Owner/Engineer shall render his interpretation or instruction in writing on the items as soon as possible.

17.02 Any work undertaken by the Contractor containing possible errors or conflicts will be done at his own risk unless he has received prior written approval from the Owner/Engineer.

17.03 The Contractor shall be responsible for estimating and supplying all quantities, and where clarification or additional information is required, a request in writing to the Owner/Engineer shall be made. No extra charge or compensation will be allowed the Contractor unless there is a change in scope or dimension of the project resulting in need for extra material, equipment and/or labor. Said differences are to be handled under Article 18.

18.00 EXTRA WORK AND EXTRA COST

18.01 The Owner, without invalidating the contract documents, may order extra work or make changes by altering, adding to or deducting from the work, the contract price being adjusted accordingly. All such work shall be executed under the conditions of the original contract except that any claim of extension of time caused thereby shall be adjusted at the time of ordering the change.

18.02 No extra work or change shall be performed unless in pursuance of a written order from the Owner/Engineer, with the agreed price prior to the commencement of the work, and no claim for an addition to the contract price shall be valid unless so ordered.

18.03 The value of any such work or change shall be determined, in one or more of the following ways:

a) By estimate and acceptance on a lump sum.
b) By unit prices named in the contract, if applicable or subsequently agreed upon.
c) By cost and percentage or by cost and a final fee.

19.00 SUBSTITUTIONS

19.01 The Contractor shall use materials as specified unless material list is of an open nature. Material other than specified will be permitted only after written application, including four (4) copies of specifications, is made by the Contractor and written approval received from the Engineer or Owner.

The material installed in the job site shall be new and of the quality specified.

The manufacturer's recommendation shall be followed for the installation of all equipment.

20.00 PRODUCT SUBMITTALS

20.01 Prior to ordering materials, the Contractor shall submit submittals as specified in the detailed specification sections. Three (3) copies of the submittals shall be forwarded to the Engineer for review and approval.

20.02 Submittals shall indicate specification Section for each product. Submittals not containing all the required information shall be returned to the contractor for re-submittal.

21.00 OWNER'S ACCEPTANCE

21.01 Within seven (7) days of the Contractor's notification that the installation is substantially complete, the Owner's authorized representative shall inspect the installation. The Owner, with the Contractor, shall take necessary steps to inspect the installation. Upon completion of the

inspection, the Owner or the Owner's authorized representative may either accept the work outright or prepare a "Punch List" that upon completion by the Contractor and acceptance by the Owner will signify final acceptance provided that all other applicable terms and provisions of the Contract have been completed to the Owner's satisfaction.

22.00 RESPONSIBILITY FOR MAINTENANCE

22.01 It will be the Contractor's responsibility to maintain the work as specified in the detailed specifications during the warranty period.

23.00 SERVICE BY THE CONTRACTOR

23.01 The Contractor shall maintain the work as specified during the warranty period.

24.00 WARRANTY

24.01 The guarantee shall be as specified in the respective sections of the specification.

24.02 The Contractor shall be responsible for the repair and/or replacement of all defective work and materials. All repair work shall be completed in a timely fashion.

24.04 Should the Contractor not respond promptly, the Owner may take any action he deems necessary to repair the defect and prevent further damage to his property, including the hiring of another contractor, or the repairing of such a defect with material supplied by the Contractor. In this event, the Contractor shall be liable for expenses incurred and property damages suffered by the Owner.

01.00 NOTICE TO CONTRACTOR

01.01 Intent of Contract: The intent of the Contract is to prescribe a complete work or improvement which the Contractor undertakes to do, in full compliance with the specifications, plans, special provisions, proposal and Contract. The Contractor shall perform all work in close conformity with the plans or as modified by written orders, including the furnishing of all materials, supplies, transportation, labor, and all other things necessary to the satisfactory prosecution and completion of the project.

The scope of the work shall include all labor, materials and equipment needed to provide and install, and equip new generators and associated equipment and materials, complete and ready for use, as described in the plans and specifications for Generator Replacement at Glastonbury Police and Fire Departments in Glastonbury, CT.

02.00 COMMUNICATIONS

02.01 All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

02.02 Any notice to, or demand upon, the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the Agreement (or at such other office as the Contractor may, from time to time, designate) in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

02.03 All papers required to be delivered to the Town shall, unless otherwise specified in writing to the Contractor, be delivered to the Building Superintendent, 2143 Main Street, Glastonbury, CT 06033, and any notice to, or demand upon, the Town shall be delivered at the above address in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office or to such other representatives of the Town, or to such other address as the Town may subsequently specify in writing to the Contractor for such purpose.

02.04 Any such notice shall be deemed to have been given as of the time of actual delivery or, in case of mailing, when the same should have been received in due course of post or, in the case of telegrams, at the time of actual receipt, as the case may be.

03.00 WORK BY OTHERS

03.01 Private utilities, contractors, developers or other parties may be expected to be working within the Contract area during this Contract. It shall be the responsibility of the contractor to coordinate his work with the work being done by others in order that the construction shall proceed in an efficient and logical manner. The Contractor shall have no claim or claims whatever against the Town, the Engineer, or other parties due to delays or other reasons caused by the work by others or his failure to coordinate such work.

04.00 CONTRACTOR'S WORK AND STORAGE AREA

04.01 The Contractor shall contact the Town to determine if any specific locations will be designated, or gain its approval prior to using any area for storage of equipment, materials and trailers during

the period of this Contract. The Contractor shall confine his work/storage area to the limits as designated or approved and shall be responsible for the security of the work/storage area. Upon completion of the Contract, the Contractor shall remove all equipment and materials, except as otherwise specified, and restore the site to its original condition as approved by the Engineer and at no cost to the Town.

05.00 DISPOSAL AREA

05.01 The Tryon Street Bulky Waste Facility will be available to the Contractor, at no charge, for disposal of materials that are accepted at that facility. No materials containing lead-based paint of any level shall be dumped at the Tryon Street facility. The Contractor is required to obtain a disposal area for all other unsuitable or surplus materials at no cost to the Town.

06.00 DUST CONTROL

06.01 During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities so as to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use water or calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed, without additional compensation.

07.00 PROTECTION OF EXISTING UTILITIES

07.01 Before starting any excavation, the Contractor shall submit to the Engineer plans or details showing the proposed method the Contractor will use to support and protect all existing utilities during construction. The furnishing of such plans and details shall not serve to relieve the Contractor of any responsibility for the proper conduct of the work.

07.02 There will be no extra payment for submitting plans or details for supporting and protecting all existing utilities during construction.

08.00 TIME FOR COMPLETION/NOTICE TO PROCEED

08.01 Within ten (10) calendar days after the date of the Notice of Award, the Contractor must provide the appropriate insurance certificates to the Town Purchasing Agent and shall be issued a Notice to Proceed and a Purchase Order prior to initiating any work on the project.

08.02 Work shall commence within thirty (30) days of the date of the Notice to Proceed/Purchase Order.

08.03 After the work has begun, it will continue in an orderly fashion and shall be fully completed within 120 consecutive calendar days from the date of commencement. The Engineer reserves the right to extend the contract an additional thirty (30) days by mutual written agreement.

08.04 Weather permitting, it is the intent of the Town to have all work required under this Contract completed no later than November 18, 2016. In no case, however, shall the work be completed any later than December 1, 2016.

08.05 Because the facilities will remain open during the installation period, the Contractor shall make every reasonable effort to complete the installation as expeditiously as possible.

09.00 MEASUREMENT AND PAYMENT

09.01 All direct, indirect, or incidental costs of work and/or services required by these specifications shall be included in the Lump Sum price.

09.02 Monthly progress payments will be made, based on the approved Schedule of Values, for work that has progressed in accordance with the contract documents, subject to a deduction of five percent (5%) of the amount of the application for payment to be retained by the Owner until completion of the entire contract in an acceptable manner and two and one half percent (2.5%) until the applicable one year warranty period has expired and all required inspections have been completed and results have been submitted and approved by the Engineer.

10.00 COMPLIANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS

10.01 This award of bid is subject to the conformance of the Contractor to all Federal, State, and Local laws, statutes, regulations, ordinances or other requirements that are applicable to the type of work contained in these specifications.

INSURANCE

The Bidder shall, at its own expense and cost, obtain and keep in force during the entire duration of the Project or Work the following insurance coverage covering the Bidder and all of its agents, employees and sub-contractors and other providers of services and shall name the **Town of Glastonbury and its employees and agents as an Additional Insured** on a primary and non-contributory basis to the Bidders Commercial General Liability and Automobile Liability policies. **These requirements shall be clearly stated in the remarks section on the Bidders Certificate of Insurance.** Insurance shall be written with insurance carriers approved in the State of Connecticut and with a minimum Best's Rating of A-VIII. In addition, all carriers are subject to approval by the Town. Minimum Limits and requirements are stated below:

1) Worker's Compensation Insurance:
- Statutory Coverage
- Employer's Liability
- $500,000 each accident/$500,000 disease-policy limit/$500,000 disease each employee
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

2) Commercial General Liability:
- Including Premises & Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors.
- Limits of Liability for Bodily Injury and Property Damage
  Each Occurrence $1,000,000
  Aggregate $2,000,000 (The Aggregate Limit shall apply separately to each job.)
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

3) Automobile Insurance:
- Including all owned, hired, borrowed and non-owned vehicles
- Limit of Liability for Bodily Injury and Property Damage: Per Accident $1,000,000
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

The Bidder shall direct its Insurer to provide a Certificate of Insurance to the Town before any work is performed. The Contractor shall be responsible to notify the Town 60 days in advance with written notice of cancellation or non-renewal. The Certificate shall evidence all required coverage. The Bidder shall provide the Town copies of any such insurance policies upon request.

INDEMNIFICATION

To the fullest extent permitted by law, the Bidder shall indemnify and hold harmless the Town of Glastonbury and its consultants, agents, and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, attorneys and other professionals and court and arbitration costs) to the extent arising out of or resulting from the performance of the Bidder's work, provided that such claim, damage, loss or expense is caused in whole or in part by any negligent act or omission by the Bidder, or breach of its obligations herein or by any person or organization directly or indirectly employed or engaged by the Bidder to perform or furnish either of the services, or anyone for whose acts the Bidder may be liable.

List of Drawings:

MEP-1	MEP Plans and Details Police Department
MEP-2	MEP Specifications Police Department
MEP-3	MEP Specifications Police Department
MEP-1	MEP Plans and Details Fire Company #1
MEP-2	MEP Specifications Fire Company #1

TOWN OF GLASTONBURY * 2155 MAIN STREET * GLASTONBURY * CT

BID / PROPOSAL NO: **GL-2016-23** **DATE DUE:** **06-30-16**

DATE ADVERTISED: **06-07-16** **TIME DUE:** **11:00 AM**

NAME OF PROJECT: **Emergency Generator Replacement Glastonbury Police/Fire Department**

In compliance with this Invitation to Bid, the Bidder hereby proposes to provide goods and/or services as per this solicitation in strict accordance with the Bid Documents, within the time set forth therein, and at the prices submitted with their bid response.

It is the responsibility of the Bidder to clearly mark the outside of the bid envelope with the Company name and Address, Bid Number, Date and Time of Bid Opening, and it also THE RESPONSIBILITY OF THE BIDDER TO CHECK THE TOWN'S WEBSITE BEFORE SUBMITTING BID FOR ADDENDA POSTED PRIOR TO BID OPENING.

THE BIDDER ACKNOWLEDGES RECEIPT OF THE FOLLOWING ADDENDA AS REQUIRED:

Addendum #1 _____(Initial/Date) **Addendum #2** _____ (Initial/Date) **Addendum #3** _____(Initial/Date)

Other Items Required with Submission of Bid Proposal
The following bid checklist describes items required for inclusion with the above-referenced bid proposal package. It is provided for the convenience of the bidders and, therefore, should not be assumed to be a complete list.

_____ Bid Bond (10% of total bid amount).

_____ List of five (5) similar projects completed within last three (3) years.

_____ Acknowledgement of Addendums (as applicable).

_____ Acknowledgement of Code of Ethics on Bid Proposal page.

_____ Sealed bids, one original and one copy.

_____ Disclosure of past and pending mediation, arbitration and litigation cases that the Bidder or its principals have been involved in for the most recent five years (if applicable).

_____ Copy of Bidder's Contractor's License (State of Connecticut).

Name of Bidder: _____

LUMP SUM BID:

Furnish and install new generators and associated equipment at Glastonbury and Fire Departments as specified in the Plans and Specifications for Bid GL-2016-23.

1.1 Installation of Emergency Generator at Police Department **$_____**

MANUFACTURER: _____

1.2 Installation of Emergency Generator at Fire Company #1 **$_____**

MANUFACTURER: _____

TOTAL OF BID AMOUNT $_____
(Numeric Bid Amount)

_____
(Written Bid Amount)

NON-COLLUSION STATEMENT:
By submission of this bid, the Bidder certifies, and in the case of a joint bid each party thereto certifies as to their own organization that this bid has been arrived at independently without consultation, communication, or agreement as to any matter relating to this bid with any other Bidder or with any competitor.

CODE OF ETHICS:
I / We have reviewed a copy of the Town of Glastonbury's Code of Ethics and agree to submit a Consultant Acknowledgement Form if I /We are selected. Yes _____ No _____ *

***Bidder is advised that effective August 1, 2003, the Town of Glastonbury cannot consider any bid or proposal where the bidder has not agreed to the above statement.**

Print Name, Title of Individual	**Doing Business as (Trade Name)**
Signature of Individual	**Street Address**
Date	**City, State, Zip Code**
E:mail Address	**Telephone Number / Fax Number**

Minimum Rates and Classifications for Building Construction

ID# : B 22253

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: GL-2016-23
Project Town: Glastonbury
State#:
FAP#:

Project: Generator Replacement For The Police Station And Fire Station Number One

CLASSIFICATION	Hourly Rate	Benefits
1a) Asbestos Worker/Insulator (Includes application of insulating materials, protective coverings, coatings, & finishes to all types of mechanical systems; application of firestopping material for wall openings & penetrations in walls, floors, ceilings	35.75	28.82
1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters.**See Laborers Group 7**		
1c) Asbestos Worker/Heat and Frost Insulator	37.15	27.56

As of: **Thursday, June 02, 2016**

2) Boilermaker	35.24	25.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	33.48	29.16 + a
3b) Tile Setter	34.30	24.15
3c) Terrazzo Mechanics and Marble Setters	31.69	22.35
3d) Tile, Marble & Terrazzo Finishers	26.43	20.59
3e) Plasterer	33.48	29.16

As of: **Thursday, June 02, 2016**

Project: Generator Replacement For The Police Station And Fire Station Number One

------LABORERS------

4) Group 1: Laborers (common or general), acetylene burners, carpenter tenders, concrete specialists, wrecking laborers, fire watchers.	28.55	18.90 + a
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).	28.80	18.90 + a
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	29.05	18.90 + a
4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is $26.80.	28.80	18.90 + a
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	29.30	18.90 + a

As of: **Thursday, June 02, 2016**

4e) Group 6: Blasters, nuclear and toxic waste removal.	31.55	18.90 + a
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	29.55	18.90 + a
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	28.38	18.90 + a
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	27.86	18.90 + a
4i) Group 10: Traffic Control Signalman	16.00	18.90 + a
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	31.45	23.54

As of: **Thursday, June 02, 2016**

5a) Millwrights	31.84	23.99
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	38.20	23.72+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	49.00	29.985+a+b
-----LINE CONSTRUCTION----		
Groundman	24.99	6.25%+11.81
Linemen/Cable Splicer	45.43	6.25%+20.70

As of: **Thursday, June 02, 2016**

8) Glazier (Trade License required: FG-1,2)	35.08	19.35 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	34.47	31.09 + a
----OPERATORS----		
Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)	38.55	23.55 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	38.23	23.55 + a
Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	37.49	23.55 + a

As of: **Thursday, June 02, 2016**

Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	37.10	23.55 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	36.51	23.55 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	36.51	23.55 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	36.20	23.55 + a
Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrell).	35.86	23.55 + a
Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	35.46	23.55 + a

As of: **Thursday, June 02, 2016**

Group 9: Front end loader (under 3 cubic yards), skid steer loader regardless of attachments, (Bobcat or Similar): forklift, power chipper; landscape equipment (including Hydroseeder).	35.03	23.55 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	32.99	23.55 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	32.99	23.55 + a
Group 12: Wellpoint operator.	32.93	23.55 + a
Group 13: Compressor battery operator.	32.35	23.55 + a
Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	31.21	23.55 + a

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	30.80	23.55 + a
Group 16: Maintenance Engineer/Oiler.	30.15	23.55 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	34.46	23.55 + a
Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	32.04	23.55 + a
------PAINTERS (Including Drywall Finishing)------		
10a) Brush and Roller	31.52	19.35

10b) Taping Only/Drywall Finishing	32.27	19.35
10c) Paperhanger and Red Label	32.02	19.35
10e) Blast and Spray	34.52	19.35
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	40.62	28.91
12) Well Digger, Pile Testing Machine	33.01	19.40 + a
13) Roofer (composition)	34.12	18.58

14) Roofer (slate & tile)	34.62	18.58
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	35.74	33.22
16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	40.62	28.91
------TRUCK DRIVERS------		
17a) 2 Axle	28.83	21.39 + a
17b) 3 Axle, 2 Axle Ready Mix	28.93	21.39 + a

As of: **Thursday, June 02, 2016**

17c) 3 Axle Ready Mix	28.98	21.39 + a
17d) 4 Axle, Heavy Duty Trailer up to 40 tons	29.03	21.39 + a
17e) 4 Axle Ready Mix	29.08	21.39 + a
17f) Heavy Duty Trailer (40 Tons and Over)	29.28	21.39 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	29.08	21.39 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	41.37	20.77 + a

19) Theatrical Stage Journeyman	25.76	7.34

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.*

***Note: Hazardous waste premium $3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $3.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

As of: **Thursday, June 02, 2016**

Project: Generator Replacement For The Police Station And Fire Station Number One

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

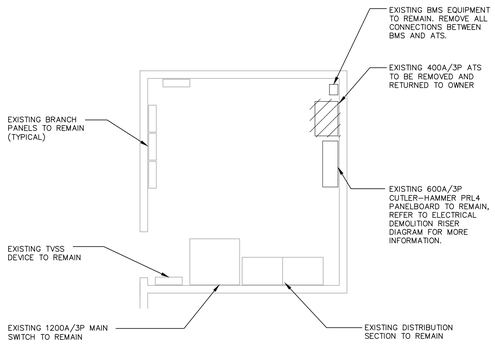
As of: **Thursday, June 02, 2016**

ELECTRICAL ABBREVIATIONS

A/AMP	AMPERE	JB	JUNCTION BOX
AC	ALTERNATING CURRENT	KCMIL	THOUSAND CIRCULAR MILS
AFG	ABOVE FINISHED GRADE	KVA	KILOVOLT AMPERE
AIC	AMPS INTERRUPTING CURRENT	KW	KILOWATT
ATS	AUTOMATIC TRANSFER SWITCH	MAX	MAXIMUM
AWG	AMERICAN WIRE GAUGE	MIN	MINIMUM
C	CONDUIT	MLO	MAIN LUGS ONLY
CATV	CABLE TELEVISION	NA	NOT APPLICABLE
C/B	CIRCUIT BREAKER	NEC	NATIONAL ELECTRIC CODE
CKT	CIRCUIT	NIC	NOT IN CONTRACT
CT	CURRENT TRANSFORMER	NTS	NOT TO SCALE
°	DEGREE	P	POLE
DIA/ø	DIAMETER	PH/ø	PHASE
DWG	DRAWING	PVC	POLYVINYL CHLORIDE CONDUIT
ELEC	ELECTRICAL	RGS	RIGID GALVANIZED STEEL CONDUIT
EMT	ELECTRIC METALLIC TUBING	SPEC	SPECIFICATION
F	FAHRENHEIT	TELE	TELECOMMUNICATIONS/TELEPHONE
FC	FOOT CANDLE	TV	TELEVISION
G	GROUND	T/TX	TRANSFORMER
GFI	GROUND FAULT INTERRUPTER	TYP	TYPICAL
HR	HOUR	V	VOLTS
HZ	HERTZ	VA	VOLT AMPERE
IN	INCHES	VAC	VOLTS ALTERNATING CURRENT
QTY	QUANTITY	W	WATT, WIRE
		WP	WEATHERPROOF

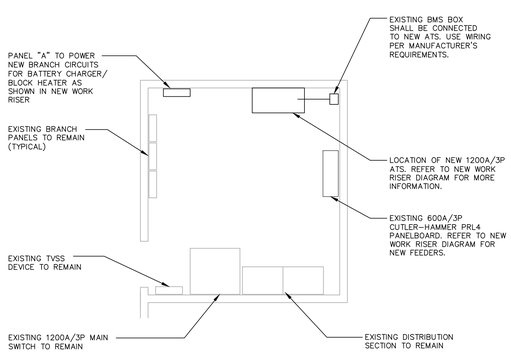
ELECTRICAL SYMBOL LIST

SYMBOL	DESCRIPTION
	MOTOR
	DISCONNECT SWITCH
	CONDUIT RUN: UNDERGROUND WHEN OUTSIDE, ALONG WALLS/CEILING WHEN INSIDE
	CIRCUIT BREAKER
	FUSED SWITCH



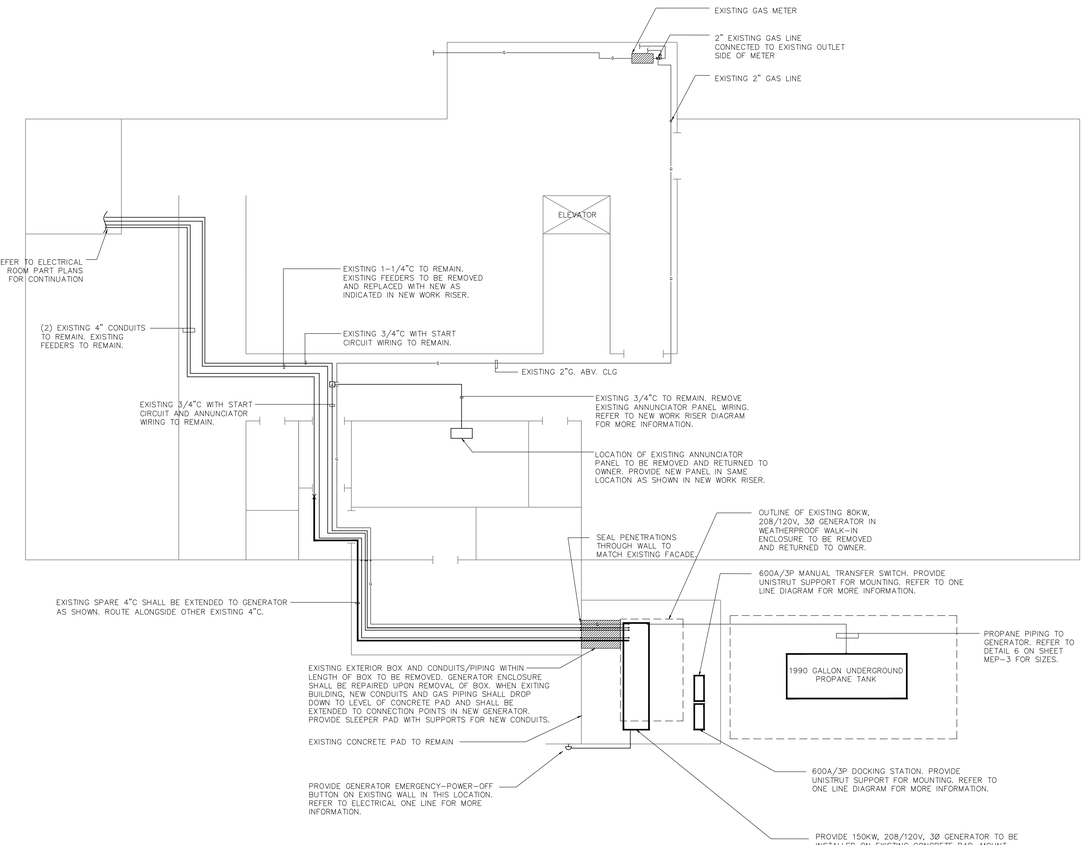
2 MAIN ELECTRICAL ROOM PART PLAN - DEMOLITION

SCALE: 1/4" = 1'



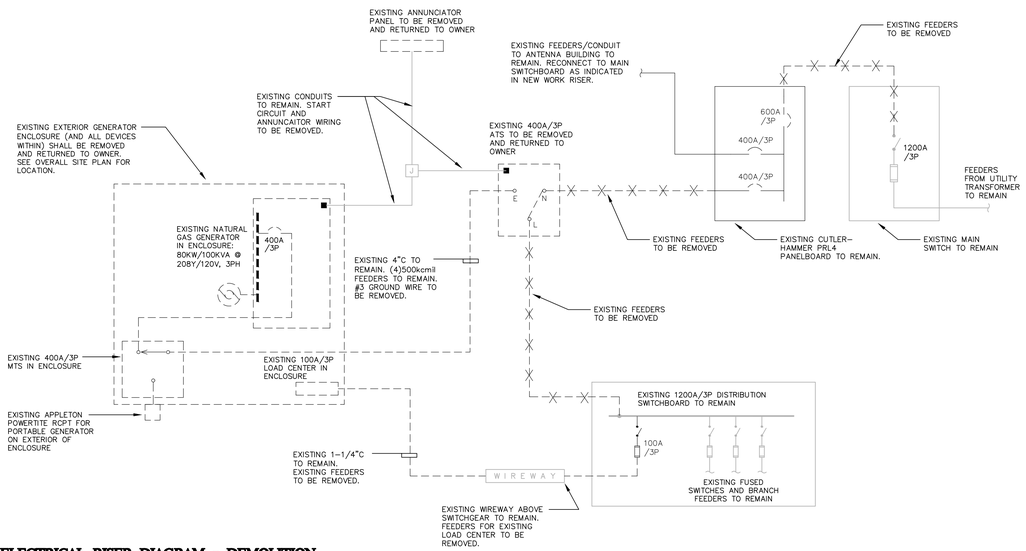
3 MAIN ELECTRICAL ROOM PART PLAN - NEW WORK

SCALE: 1/4" = 1'



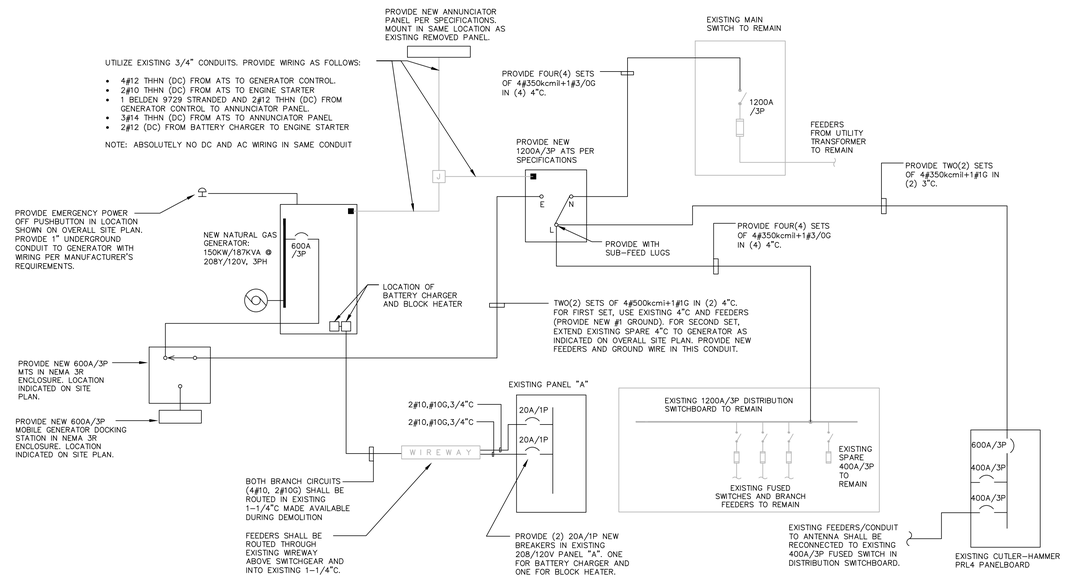
1 OVERALL SITE PLAN

SCALE: 1/8" = 1'



4 ELECTRICAL RISER DIAGRAM - DEMOLITION

N.T.S.



5 ELECTRICAL RISER DIAGRAM - NEW WORK

N.T.S.

CES
Consulting Engineering Services, Inc.
811 Middle Street
Middletown, CT 06457
Tel. (860) 632-1682
Fax. (860) 632-1768
CES #2015178.00

TOWN OF GLASTONBURY

2143 MAIN STREET GLASTONBURY, CT 06033

REVISIONS		
NO.	DATE	DESCRIPTION

POLICE STATION GENERATOR REPLACEMENT PROJECT: GL-2016-23

2108 MAIN STREET GLASTONBURY, CT 06033

MEP PLANS AND DETAILS

DATE:	7/15/15
PROJECT NO:	2015229.00
DRAWN:	MFC
CHECKED:	SAS
ISSUED FOR:	CONSTRUCTION
REVISIONS:	

SHEET NO.

MEP-1

GENERAL ELECTRICAL SPECIFICATIONS

1. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. THE EXISTING BUILDING IS CURRENTLY OCCUPIED AND THE PROJECT WILL PROCEED IN A MANNER WHICH WILL MINIMIZE ANY INCONVENIENCE TO THE BUILDING OCCUPANTS.

2. PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK TO BE PERFORMED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL DEMOLITION WORK REQUIRED.

3. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, PLANT, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL ELECTRICAL WORK AS SHOWN ON THE DRAWINGS AS DESCRIBED HEREIN.

4. THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT:

   A. FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

   B. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

   C. PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

   D. REMOVE: THE TERM "REMOVE" MEANS " TO DISCONNECT FROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."

5. PROVIDE ALL NECESSARY MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. THE CONTRACTOR IS TO NOTE THAT THESE DOCUMENTS ARE DIAGRAMMATIC ONLY AND THAT FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT IN WHICH IS SHOWN ON THE DRAWINGS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.

6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST STATE OF CONNECTICUT ACCEPTED REVISION OF THE NATIONAL ELECTRIC CODE (NEC), NFPA 70, NFPA 110, AND THE NFPA 101 LIFE SAFETY CODE.

7. OBTAIN IN OWNER'S NAME WRITTEN EQUIPMENT AND MATERIAL WARRANTIES OFFERED IN MANUFACTURER'S PUBLISHED PRODUCT DATA WITHOUT EXCLUSION OR LIMITATION.

8. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.

9. SUPPLY TO THE OWNER AN OFFICIAL CERTIFICATE OF INSURANCE FOR THEIR RECORDS.

10. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ARRANGING AND BEING AVAILABLE FOR INSPECTIONS BY THE AUTHORITY HAVING JURISDICTION.

11. USE ADEQUATE NUMBERS OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK.

12. ARRANGE INSTALLATION TO PROVIDE ACCESS TO EQUIPMENT FOR EASY MAINTENANCE AND REPAIR.

13. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.

14. MATERIALS AND EQUIPMENT SHALL BE UL LISTED WHERE STANDARD HAS BEEN ESTABLISHED.

15. DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNER'S PROPERTY. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.

16. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCE AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER HANDLING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE. CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS.

17. THE CONTRACTOR SHALL BE REQUIRED TO PROPERLY STORE MATERIALS AND EQUIPMENT SO AS TO AVOID THEFT OR VANDALISM. IF THEFT OR VANDALISM OCCURS, THE CONTRACTOR SHALL REPAIR OR REPLACE SUCH ITEMS AT THE DIRECTION OF THE ENGINEER.

18. PROVIDE LAMINATED PLASTIC NAMEPLATES FOR EACH DISCONNECT SWITCH. EACH NAMEPLATE INSCRIPTION SHALL IDENTIFY THE FUNCTION AND, WHEN APPLICABLE, THE POSITION. NAMEPLATES SHALL BE MELAMINE PLASTIC, 0.125-INCH THICK, WHITE WITH BLACK CENTER CORE. SURFACE SHALL BE MATTE FINISH. CORNERS SHALL BE SQUARE. ACCURATELY ALIGN LETTERING AND ENGRAVE INTO THE CORE. MINIMUM SIZE OF NAMEPLATES SHALL BE 1 BY 2.5 INCHES. LETTERING SHALL BE A MINIMUM OF 0.25-INCH HIGH NORMAL BLOCK STYLE.

19. GROUNDING SHALL BE COMPLETED IN ACCORDANCE WITH NFPA 70. GROUND EXPOSED, NON-CURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN METALLIC AND NONMETALLIC RACEWAYS, GROUNDING CONDUCTOR OF NONMETALLIC SHEATHED CABLES, AND NEUTRAL CONDUCTOR OF WIRING SYSTEMS. MAKE GROUND CONNECTION AT MAIN SERVICE EQUIPMENT, AND EXTEND GROUNDING CONDUCTOR TO POINT OF ENTRANCE OF METALLIC WATER SERVICE. MAKE CONNECTION TO WATER PIPE BY SUITABLE GROUND CLAMP WITH METER JUMPER OR LUG CONNECTION TO PLUGGED TEE. IF FLANGED PIPES ARE ENCOUNTERED, MAKE CONNECTION WITH LUG BOLTED TO STREET SIDE OF FLANGED CONNECTION. SUPPLEMENT METALLIC WATER SERVICE GROUNDING SYSTEM WITH ADDITIONAL MADE ELECTRODE IN COMPLIANCE WITH NFPA 70. WHERE GROUND FAULT PROTECTION IS EMPLOYED, ENSURE THAT CONNECTION OF GROUND AND NEUTRAL DOES NOT INTERFERE WITH CORRECT OPERATION OF FAULT PROTECTION.

20. CONDUCTORS NO. 8 AWG AND LARGER DIAMETER SHALL BE STRANDED ANNEALED COPPER. CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER SHALL BE SOLID ANNEALED COPPER, EXCEPT THAT CONDUCTORS FOR REMOTE CONTROL, ALARM, AND SIGNAL CIRCUITS, CLASSES 1, 2, AND 3, SHALL BE STRANDED UNLESS SPECIFICALLY INDICATED OTHERWISE. CONDUCTOR SIZES AND AMPACITIES SHOWN ARE BASED ON COPPER, UNLESS INDICATED OTHERWISE. UNLESS SPECIFIED OR INDICATED OTHERWISE OR REQUIRED BY NFPA 70, POWER AND LIGHTING WIRES SHALL BE 600-VOLT, TYPE THWN/THHN ANNEALED COPPER, REMOTE-CONTROL AND SIGNAL CIRCUITS SHALL BE TYPE TW, THW, OR TF ANNEALED COPPER. WHERE LIGHTING FIXTURES REQUIRE 90 DEGREES C CONDUCTORS, PROVIDE ONLY CONDUCTORS WITH 90 DEGREE C INSULATION OR BETTER.

21. MAKE ALL SPLICES IN ACCESSIBLE LOCATIONS. MAKE SPLICES IN CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER WITH INSULATED, PRESSURE-TYPE CONNECTOR. MAKE SPLICES IN CONDUCTORS NO. 8 AWG AND LARGER DIAMETER WITH SOLDERLESS CONNECTOR, AND COVER WITH INSULATION MATERIAL EQUIVALENT TO CONDUCTOR INSULATION.

22. PHASE CONDUCTORS SHALL BE IDENTIFIED BY COLOR CODING. THE COLOR OF THE INSULATION ON PHASES A, B, AND C RESPECTIVELY (FOR THREE PHASE) OR PHASES A AND B RESPECTIVELY (FOR SINGLE PHASE) OF DIFFERENT VOLTAGE SYSTEMS SHALL BE AS FOLLOWS: 120/208 VOLT, 3-PHASE: BLACK, RED, AND BLUE. 277/480 VOLT, 3-PHASE: BROWN, ORANGE, AND YELLOW. 120/240 VOLT, SINGLE/PHASE: BLACK AND RED. ON 3-PHASE, 4-WIRE DELTA SYSTEM, HIGH LEG SHALL BE ORANGE, AS REQUIRED BY NFPA 70.

23. UNLESS OTHERWISE INDICATED, THE WIRING METHOD SHALL CONSIST OF THE INSTALLATION OF INSULATED CONDUCTORS INSTALLED IN ELECTRICAL METALLIC CONDUIT. PROVIDE INSULATED, GREEN EQUIPMENT GROUNDING CONDUCTOR IN FEEDER AND BRANCH CIRCUITS, INSTALLED IN CONDUIT OR RACEWAYS. GROUNDING CONDUCTOR SHALL BE SEPARATE FROM ELECTRICAL SYSTEM NEUTRAL CONDUCTOR. METAL CONDUIT SHALL EXTEND THROUGH SHAFTS FOR MINIMUM DISTANCE OF 6 INCHES. CONDUIT SIZES SHOWN ARE BASED ON USE OF COPPER CONDUCTORS WITH INSULATION TYPES AS INDICATED HEREIN. IF THE USE OF ALUMINUM CONDUCTORS IS ALLOWED, THE CONTRACTOR SHALL UPSIZE ALL CONDUITS ACCORDING TO NFPA 70. MINIMUM SIZE OF RACEWAYS SHALL BE 15 MM (1/2 INCH). ONLY METAL CONDUITS WILL BE PERMITTED WHEN CONDUITS ARE REQUIRED FOR SHIELDING OR OTHER SPECIAL PURPOSES INDICATED, OR WHEN REQUIRED BY CONFORMANCE TO NFPA 70.

24. ELECTRICAL METALLIC TUBING MAY BE INSTALLED ONLY WITHIN BUILDINGS. ELECTRICAL METALLIC TUBING MAY NOT BE INSTALLED IN CONCRETE OR EXTERIOR TO BUILDINGS. EMT SHALL NOT BE INSTALLED IN DAMP OR WET LOCATIONS. DO NOT USE IN AREAS SUBJECT TO SEVERE PHYSICAL DAMAGE INCLUDING BUT NOT LIMITED TO EQUIPMENT ROOMS WHERE MOVING OR REPLACING EQUIPMENT COULD PHYSICALLY DAMAGE THE EMT. BUSHINGS, MANUFACTURED FITTINGS OR BOXES PROVIDING EQUIVALENT MEANS OF PROTECTION SHALL BE INSTALLED ON THE ENDS OF ALL CONDUITS AND SHALL BE OF THE INSULATING TYPE, WHERE REQUIRED BY NFPA 70. ONLY UL LISTED ADAPTERS SHALL BE USED TO CONNECT EMT TO RIGID METAL CONDUIT, CAST BOXES, AND CONDUIT BODIES. METALLIC CONDUITS AND TUBING SHALL BE SECURELY AND RIGIDLY FASTENED IN PLACE AS REQUIRED BY NFPA 70.

25. SCHEDULE 40 PVC CONDUIT SHALL BE PROVIDED UNDERGROUND.

26. PROVIDE ALL NECESSARY JUNCTION BOXES, PULL BOXES, PULL WIRES, COVER PLATES AND OTHER MISCELLANEOUS EQUIPMENT WHICH IS NOT SHOWN ON THE CONTRACT DOCUMENTS BUT NECESSARY TO COMPLETE THE WORK.

27. CORE DRILL EXISTING WALL AND PROVIDE WEATHERTIGHT SLEEVES FOR CONDUIT PENETRATIONS. PROVIDE WEATHERPROOF SEALS FOR CONDUIT PENETRATIONS THROUGH CONCRETE FOUNDATION WALLS. PROVIDE CONDUIT SLEEVES AT WALL, LINKSEAL OR SIMILAR.

28. PROVIDE PRE-LABELED, SNAP AROUND PIPE MARKERS ON ALL CONDUITS. MARKERS SHALL COMPLY WITH ANSI A 13.1-1988 STANDARDS AND INDICATED VOLTAGE.

29. COORDINATE ALL WORK WITH OTHER TRADES AND ARRANGE INSTALLATION TO AVOID CLASHES BETWEEN EQUIPMENT, WORK OF OTHER TRADES AND BUILDING STRUCTURE.

30. PROVIDE SHOP DRAWINGS FOR GENERATOR, DISCONNECTS, ANNUNCIATOR PANEL, CONDUITS, FEEDERS, AND ALL CONNECTION EQUIPMENT.

31. AS-BUILT DRAWINGS

   A. PREPARE AS-BUILT DRAWINGS TO A SCALE OF 1/4"=1'-0" OR LARGER; DETAILING THE ACTUAL INSTALLATION OF MAJOR ELEMENTS, COMPONENTS, AND SYSTEMS OF ELECTRICAL EQUIPMENT AND MATERIALS. WHERE SHOP DRAWINGS ARE USED, RECORD A CROSS-REFERENCE AT THE CORRESPONDING LOCATION ON THE AS-BUILT DRAWINGS. GIVE PARTICULAR ATTENTION TO CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO MEASURE AND RECORD AT A LATER DATE.

   B. MARK NEW INFORMATION THAT IS IMPORTANT TO THE OWNER, BUT WAS NOT SHOWN ON CONTRACT DRAWINGS OR SHOP DRAWINGS.

   C. NOTE RELATED CHANGE ORDER NUMBERS WHERE APPLICABLE.

   D. ORGANIZE AS-BUILT DRAWINGS INTO MANAGEABLE SETS, BIND WITH DURABLE PAPER COVER SHEETS, AND PRINT SUITABLE TITLES, DATES AND OTHER IDENTIFICATION ON THE COVER OF EACH SET.

GENERATOR SPECIFICATIONS

Section 1.0 General Requirements

1.1 Scope
Provide, install, and acceptance test a complete and operable Emergency/Standby electric generating system, including all devices and equipment specified herein, as shown on the drawings, or required for the service. Equipment shall be new, factory tested, and delivered ready for installation.

1.2 Approved Manufacturers:
Equipment, documentation, and services described in this specification and shown on the plans are as provided by Cummins Power Generation, Minneapolis, Minnesota.

1.3 Warranty:
Shall be provided for all products against defects in materials and workmanship for five year period from the start_up date.

1.4 Single Supplier:
The installer/supplier shall be the manufacturer's authorized distributor/dealer, who shall provide complete installation, initial start_up services, conduct field acceptance testing, and warranty service. The supplier shall have 24_hour service availability and factory_trained service technicians authorized to perform warranty service on all products provided.

1.5 Manuals:
Three (3) Sets Operators and spare parts manuals shall be provided for all system equipment. The manuals shall include outline, interconnection, wiring, and control drawings accurately describing the equipment provided. Provide ladder logic for all programmable logic controllers in the system.

Section 2.0 Products

2.1 Dual Fuel Natural Gas and LP Vapor Withdrawal Engine_Generator Set
4_cycle, 1800 rpm, natural gas engine generator set. Generator set ratings: 150 kW, 187.5 kVA at 0.8 PF, standby rating, based on site conditions noted below. System voltage of: 120/208 Volts AC, three phase, four wire, 60 hertz. Site Conditions: Altitude 500 ft., ambient temperatures up to 104 degrees F.

Basis of Design: Cummins model 150GFPA.
Approved alternates by Kohler.
No substitutions permitted.

2.1.1 Performance:
Voltage regulation shall be +/_ 1.0 percent for any constant load between no load and rated load.

Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.25%.

The engine_generator set shall be capable of single step load pick up of 100% nameplate kW and power factor, less applicable derating factors, with the engine_generator set at operating temperature.

Motor starting capability shall be a minimum of 663 kVA. The generator set shall be capable of sustaining a minimum of 90% of rated no load voltage with the specified kVA load at near zero power factor applied to the generator set.

2.1.2 Engine:
The engine shall be certified to current emissions Standards. The engine shall be dual fueled, natural gas with automatic change-over to LP vapor withdrawal, 4 cycle, radiator and fan cooled. Minimum displacement shall be 537 cubic inches, with 6 cylinders. The horsepower rating of the engine at its minimum tolerance level shall be sufficient to drive the alternator and all connected accessories. Two cycle engines are not acceptable.
Engine accessories and features shall include:

Skid_mounted radiator and cooling system rated for full load operation in 122 degrees F (50 degrees C) ambient as measured at the generator air inlet. Radiator shall be provided with a duct adapter flange. The cooling system shall be filled with 50/50 ethylene glycol/water mixture by the equipment supplier. Rotating parts shall be guarded against accidental contact per OSHA requirements.
An electric starter(s) capable of three complete cranking cycles without overheating.

Positive displacement, mechanical, full pressure, lubrication oil pump.

Full flow lubrication oil filters with replaceable spin_on canister elements and dipstick oil level indicator.

Replaceable dry element air cleaner with restriction indicator.

Flexible supply fuel line.

Engine mounted battery charging alternator, 75 ampere minimum, and solid_state voltage regulator.

2.1.3 AC Generator:
The AC generator shall be; synchronous, four pole, 2/3 pitch, revolving field, dripproof construction, single prelubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc. All insulation system components shall meet NEMA MG1 temperature limits for Class H insulation system. Actual temperature rise measured by resistance method at full load shall not exceed 125 degrees Centigrade.

The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage not more than 5 percent above or below rated voltage.

2.1.4 Engine_Generator Set Control:
The NEMA 1 enclosed control panel shall be mounted on the generator set with vibration isolators. The control shall be vibration isolated and prototype tested to verify the durability of all components in the system under the vibration conditions encountered. The generator set mounted control shall include the following features and functions:

2.1.4.1 Three position control switch labeled RUN/OFF/AUTO.

2.1.4.2 RESET switch.

2.1.4.3 PANEL LAMP switch.

2.1.4.4 Generator Set AC Output Metering:

Analog AC Voltmeter, dual range, 90 degree scale, 2% accuracy; Analog AC Ammeter, dual range, 90 degree scale, 2% accuracy; Analog Frequency/RPM meter, 45_65 Hz, 1350_1950 RPM, 90 degree scale, +/_ 0.6 Hz accuracy.

Seven position phase selector switch with OFF position to allow meter display of current and voltage in each generator phase. When supplied with reconnectable generators, the meter panel shall be reconnectable for the voltage specified.

2.1.4.5 Generator Set Alarm and Status Display:
The generator set shall be provided with alarm and status indicating lamps to indicate non_automatic generator status, and existing alarm and shutdown conditions. The lamp condition shall be clearly apparent under bright room lighting conditions. The generator set control shall indicate the existence of the following alarm and shutdown conditions on the display panel:
- low oil pressure (alarm)
- low oil pressure (shutdown)
- low coolant temperature (alarm)
- high coolant temperature (alarm)
- high coolant temperature (shutdown)
- low coolant level (shutdown)
- overcrank (shutdown)
- overspeed (shutdown)

In addition, provisions shall be made for indication of two customer_specified alarm or shutdown conditions. The non_automatic indicating lamp shall be red, and shall flash to indicate that the generator set is not able to automatically respond to a command to start from a remote location.

Provide a low coolant level shutdown that shall be annunciated as a high engine temperature alarm.

2.1.4.6 Engine Status Monitoring:
The following devices shall be provided on the generator set control:
- engine oil pressure guage
- engine coolant temperature gauge
- engine operation hour gauge
- number of hours of operation (hours)
- battery voltage (DC volts)

2.1.4.7 Control Functions:
The control system provided shall include a cycle cranking system, which shall be for 3 cranking periods of 15 seconds each, with 15 second rest period between cranking periods. Fail to start shall be indicated by operation of the overcrank alarm indication lamp.

The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification.

2.1.4.8 Alternator Control Functions:
The generator set shall include an automatic voltage regulation system which is matched and prototype tested with the governing system provided. It shall be immune from misoperation due to load_induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The system shall include a torque_matching characteristic, which shall reduce output voltage in proportion to frequency below a threshold of [58_59] HZ.

Voltage adjusting rheostat, locking screwdriver type, to adjust voltage +/_ 5% from rated value

2.1.4.9 Control Interfaces for Remote Monitoring:
Provide the following features in the control system:

Form "C" dry common alarm contact set rated 2A @ 30VDCto indicate existence of any alarm or shutdown condition on the generator set.

One set of contacts rated 2A @ 30VDC to indicate generator set is ready to load. The contacts shall operate when voltage and frequency are greater than 90% of rated condition.

A fused 10 amp switched 12VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit whenever the generator set is running.

A fused 20 amp 12VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit at all times from the engine starting/control batteries.

2.1.5 Base:
The engine_generator set shall be mounted on a heavy duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.

2.1.6 Generator Set Auxiliary Equipment and Accessories:

2.1.6.1 Water Jacket Heater
Engine mounted, thermostatically controlled, water jacket heater for each engine. The heater shall be sized as recommended by the generator set manufacturer. Heater voltage shall be 120 VAC. Provide a 20A circuit at the generator.

2.1.6.2 Exhaust Silencer/Catalyst
A combination critical grade silencer and catalyst shall be provided for each engine, size and type as recommended by the generator set manufacturer. The silencer shall be supported such that its weight is not supported by the engine. The silencer shall be mounted inside the sound attenuated enclosure. Roof mounted silencers are not acceptable.

2.1.6.3 Starting and Control Batteries
Starting battery bank, lead acid type, 12 volt DC, sized as recommended by the generator set manufacturer, shall be supplied for each generator set with battery cables and connectors. A battery disconnect switch shall be included.

2.1.6.4 Battery Charger
Provide a 10 amp, 12VDC battery charger, with float/equalize and alarms equivalent to SENS model NRG-22-10. Provide a 20 amp circuit at the generator.

2.1.6.5 Generator Set Main Circuit Breaker
Generator circuit breaker shall be 600 amps, 600V, set_mounted and wired, UL listed, molded case type with electronic trip unit

2.1.7 Quiet Site II, Level 2 Sound Attenuated Enclosure
The generator set shall be provided with an outdoor enclosure. The package shall comply with the requirements of the National Electrical Code for all wiring materials and component spacing. Housing shall provide ample airflow for generator set operation at rated load in an ambient temperature of 100F. The housing shall have hinged access doors as required to maintain easy access for all operating and service functions. All doors shall be lockable, and include retainers to hold the door open during service. Enclosure roof shall be cambered to prevent rainwater accumulation. Openings shall be screened to limit access of rodents into the enclosure. All electrical power and control interconnections shall be made within the perimeter of the enclosure.
All sheet metal shall be primed for corrosion protection and finish painted with the manufacturer's standard color using a two-step electro-coating paint process, or equal meeting the performance requirements specified below. All surfaces of all metal parts shall be primed and painted. The painting process shall result in a coating that meets the following requirements:
- Primer thickness, 0.5-2.0 mils. Top coat thickness, 0.8-1.2 mils.
- Gloss, per ASTM D523-89, 80% plus or minus 5%. Gloss retention after one year shall exceed 50%.
- Crosshatch adhesion, per ASTM D3359-93, 4B-5B.
- Impact resistance, per ASTM D2794-93, 120-160 inch-pounds.
- Salt Spray, per ASTM B117-90, 1000+ hours.
- Humidity, per ASTM D2247-92, 1000+ hours.
- Water Soak, per ASTM D2247-92, 1000+ hours.
- Painting of hoses, clamps, wiring harnesses, and other non-metallic service parts shall not be acceptable. Fasteners used shall be corrosion resistant, and designed to minimize marring of the painted surface when removed for normal installation or service work. Enclosure shall be constructed of minimum 12 gauge steel for framework and 14 gauge steel for panels. All hardware and hinges shall be stainless steel. The exhaust shall exit the enclosure through a rain collar and terminate with a rain cap. Exhaust connections to the generator set shall be through seamless flexible connections.
- Flexible coolant and lubricating oil drain lines, that extend to the exterior of the enclosure, with internal drain valves
- External radiator fill provision.
- The generator set shall be provided with a sound-attenuated housing which allows the generator set to operate at full rated load in an ambient temperature of up to 100F. The enclosure shall reduce the sound level of the generator set while operating at full rated load to a maximum of 75 dBA at any location 7 meters from the generator set in a free field environment. The enclosure shall be insulated with non-hydroscopic materials. The enclosure shall include a floor to prevent noise transmission after mounting on the roof dunnage. Provide vibration spring isolators.

2.1.9 Remote Annunciator Panel
Provide remote annunciator panel in compliance with NFPA-110.

2.1.10 Remote Emergency Stop Switch
Provide a remote emergency stop switch inside the building as directed by the owner.

2.2 Automatic Transfer Switch
Provide complete factory assembled power transfer equipment with electronic controls designed for designed for fully automatic operation and including: surge voltage isolation, voltage sensors on all phases of the normal source and one phase of the emergency source, positive mechanical and electrical interlocking, and mechanically held contacts for both sources.
The generator set manufacturer shall warrant transfer switches to provide a single source of responsibility for all the products provided. Technicians specifically trained to support the product and employed by the generator set supplier shall service the transfer switches.

2.2.1 Codes and Standards
The automatic transfer switch shall conform to the requirements of the following codes and standards: UL1008. The transfer switch shall be UL listed and labeled.
CSA C22.2, No. 14 - M91 Industrial Control Equipment.
CSA 282, Emergency Electrical Power Supply for Buildings
IEEE Standard C62.41 and C62.45.
NFPA70 - National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
NFPA99 - Essential Electrical Systems for Health Care Facilities
NFPA110 - Emergency and Standby Power Systems. The transfer switch shall meet all requirements for Level 1 systems.
IEEE446 - Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
NEMA ICS10-1993 - AC Automatic Transfer Switches.
The transfer switch manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

2.2.2 Acceptable Manufacturers
Only approved bidders shall supply equipment provided under this contract. Equipment specifications for this project are based on transfer switches manufactured by Cummins. Equipment by other suppliers that meets the requirement of this specification are acceptable, if approved not less than 2 weeks before scheduled bid date. Proposals must include a line by line compliance statement based on this specification.

2.2.3 Ratings
Standby ATS: 600 Amps, 208V, 3 pole, 4 Wire, NEMA 1 enclosed Cummins Series OTEC with programmed transition
Main contacts shall be rated for the operation voltage as installed.
Transfer switches shall be rated to carry 100 percent of rated current continuously in the enclosure supplied, in ambient temperatures of _40 to +60 degrees C, relative humidity up to 95% (non_condensing), and altitudes up to 10,000 feet (3000M).
Transfer switch equipment shall have withstand and closing ratings (WCR) in RMS symmetrical amperes equal to 65,000 at 600V. The transfer switch and its upstream protection shall be coordinated. The transfer switch shall be third party listed and labeled for use with the specific protective device(s) installed in the application.

2.2.4 Construction
Transfer switches shall be double_throw, electrically and mechanically interlocked, and mechanically held in the source 1 and source 2 positions.
Transfer switch internal wiring shall be composed of pre-manufactured harnesses that are permanently marked for source and destination. Harnesses shall be connected to the control system by means of locking disconnect plug(s), to allow the control system to be easily disconnected and serviced without disconnecting power from the transfer switch mechanism.
Transfer switch shall be provided with flame retardant transparent covers to allow viewing of switch contact operation but prevent direct contact with line voltage components.
Transfer switches shall be 3-pole and shall be provided with a neutral bus and lugs. The neutral bus shall be sized to carry 100% of the current designated on the switch rating.
Enclosures shall be UL listed and NEMA 1 rated. The enclosure shall provide NEC wire bend space when both sources and the load are all connected from either the top or bottom of the transfer switch. The cabinet door shall be key_locking.
Connections
Field control connections shall be made on a common terminal block that is clearly and permanently labeled.
Transfer switch shall be provided with AL/CU mechanical lugs sized to accept the full output rating of the generator set.
Transfer Switch Control
Solid_state under voltage sensors shall simultaneously monitor both sources. Pick_up and drop_out settings shall be adjustable. Voltage sensors shall have field calibration of actual supply voltage to nominal system voltage.
Automatic controls shall signal the engine_generator set to start upon signal from normal source sensor. Solid_state time delay start, adjustable from 0 to 15 seconds (factory set at 2 seconds) shall avoid nuisance start_ups. Battery voltage starting contacts shall be silver, dry type contacts factory wired to a field wiring terminal block.
The switch shall transfer when the emergency source reaches the set point. Provide a solid_state time delay on transfer, adjustable from 2 to 120 seconds, factory set at 3 seconds.
The switch shall retransfer the load to the normal source after a time delay retransfer, adjustable from 6 seconds to 30 minutes, factory set at 5 minutes. Retransfer time delay shall be immediately bypassed if the emergency power source fails.
Controls shall signal the engine_generator set to stop after a time delay, adjustable from 2 seconds to 10 minutes, and factory set at 5 minutes, beginning on return to the normal source.
The control system shall include field adjustable provisions to control the speed of transfer of the transfer switch.
Power for transfer operation shall be from the source to which the load is being transferred.
The control shall include latching diagnostic indicators to pinpoint the last successful step in the sequence of control functions, and to indicate the present status of the control functions in real time, as follows:

Normal AvailableStart (Gen Set)Emergency AvailableTransfer TimingTransfer CompleteRetransfer TimingRetransfer CompleteTiming for Stop
Provide solid state exerciser clock to set the day, time, and duration of generator set exercise/test period. Provide a with/without load selector switch for the exercise period.
Front Panel Devices:
Provide control switches mounted on cabinet front for:

Test _ Simulates normal power loss to control for testing of generator set. Controls shall provide for a test with or without load transfer.
Retransfer _ Momentary position to override retransfer time delay and cause immediate return to normal source, if available.
Provide LED-type switch position and source available indicator lamps on the front of the transfer switch cabinet.
Control Interface
The transfer switch will provide an isolated relay contact for starting of a generator set. The relay shall be normally held open, and close to start the generator set. Output contacts shall be form C, for compatibility with any generator set.
Provide one set Form C auxiliary contacts on both sides, operated by transfer switch position, rated 10 amps 250 VAC.
The transfer switch shall provide relay contacts to indicate the following conditions: source 1 available, load connected to source 1, source 2 available, source 2 connected to load.
Enclosure
Enclosures shall be UL listed. The cabinet door shall be key_locking.
Transfer switch equipment shall be provided in a NEMA 1 or better enclosure.
Enclosures shall be the NEMA type specified. The cabinet shall provide code-required wire bend space at point of entry as shown on the drawings. Manual operating handles and all control switches (other than key_operated switches) shall be accessible to authorized personnel only by opening the key_locking cabinet door. Transfer switches with manual operating handles and/or non key_operated control switches located on outside of cabinet do not meet this specification and are not acceptable.

2.2.5 OPERATION
Open Transition Sequence of Operation
Transfer switch normally connects an energized utility power source (source 1) to loads and a generator set (source 2) to the loads when normal source fails. The normal position of the transfer switch is source 1 (connected to the utility), and no start signal is supplied to the genset.
Generator Set Exercise (Test) With Load Mode. The control system shall be configurable to test the generator set under load. In this mode, the transfer switch shall control the generator set in the following sequence:
Transfer switch shall initiate the exercise sequence at a time indicated in the exercise timer program, or when manually initiated by the operator.
When the control systems senses the generator set at rated voltage and frequency, it shall operate to connect the loads to the generator set by opening the normal source contacts, and closing the alternate source contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.
The generator set shall operate connected to the load for the duration of the exercise period. If the generator set fails during this period, the transfer switch shall automatically reconnect the generator set to the normal service.
On completion of the exercise period, the transfer switch shall operate to connect the loads to the normal source by opening the alternate source contacts, and closing the normal source contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.
The transfer switch shall operate the generator set unloaded for a cooldown period, and then remove the start signal from the generator set. If the normal power fails at any time when the generator set is running, the transfer switch shall immediately connect the system loads to the generator set.

2.3 Non-Automatic Transfer Switch

Non-Automatic Transfer Switch: 600 Amps, 208V, 3 pole, 4 Wire, NEMA 3R enclosed Cummins Series OT III.
Main contacts shall be rated for the operation voltage as installed.
Transfer switches shall be rated to carry 100 percent of rated current continuously in the enclosure supplied, in ambient temperatures of _40 to +60 degrees C, relative humidity up to 95% (non_condensing), and altitudes up to 10,000 feet (3000M).
Transfer switch equipment shall have withstand and closing ratings (WCR) in RMS symmetrical amperes equal to 65,000 at 600V. The transfer switch and its upstream protection shall be coordinated. The transfer switch shall be third party listed and labeled for use with the specific protective device(s) installed in the application.

2.3.1 Construction
Transfer switches shall be double_throw, electrically and mechanically interlocked, and mechanically held in the source 1 and source 2 positions.
Transfer switch internal wiring shall be composed of pre-manufactured harnesses that are permanently marked for source and destination. Harnesses shall be connected to the control system by means of locking disconnect plug(s), to allow the control system to be easily disconnected and serviced without disconnecting power from the transfer switch mechanism.
Transfer switch shall be provided with flame retardant transparent covers to allow viewing of switch contact operation but prevent direct contact with line voltage components.
Transfer switches shall be 3-pole and shall be provided with a neutral bus and lugs. The neutral bus shall be sized to carry 100% of the current designated on the switch rating.
Enclosures shall be UL listed and NEMA 3R rated. The enclosure shall provide NEC wire b

GENERAL PLUMBING SPECIFICATIONS

PLUMBING SPECIFICATIONS

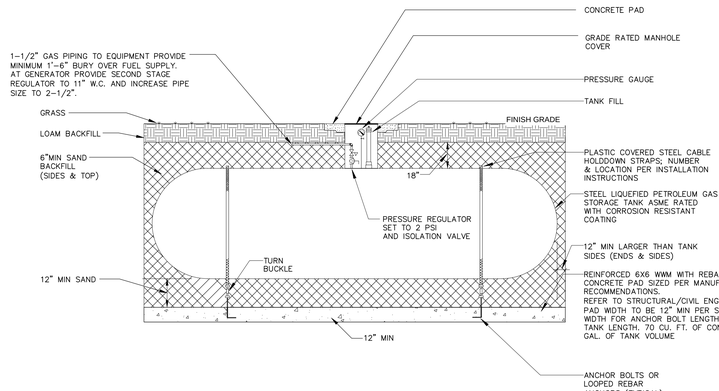
1. THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING DRAWINGS AND WORK UNLESS NOTED OTHERWISE.
2. DESCRIPTION
   - A. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. THE EXISTING BUILDING IS CURRENTLY OCCUPIED AND THE PROJECT WILL PROCEED IN A MANNER WHICH WILL MINIMIZE ANY INCONVENIENCE TO THE BUILDING OCCUPANTS.
   - B. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, PLANT, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND AS DESCRIBED HEREIN.
3. DEFINITIONS: THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT
   - A. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."
   - B. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
   - C. PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
   - D. REMOVE: THE TERM REMOVE MEANS TO DISCONNECTFROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."
   - E. SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT.
4. DRAWINGS
   - A. PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. THE CONTRACTOR IS TO NOTE THAT THESE DOCUMENTS ARE DIAGRAMMATIC ONLY AND THAT FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.
5. SURVEY AND MEASUREMENTS:
   - A. PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK TO BE PERFORMED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL DEMOLITION WORK REQUIRED.
   - B. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.
   - C. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE.
   - D. ARRANGE INSTALLATION TO PROVIDE ACCESS TO EQUIPMENT FOR EASY MAINTENANCE AND REPAIR.
6. CODES AND STANDARDS: ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST STATE OF CONNECTICUT ACCEPTED VERSION OF THE FOLLOWING
   - A. INTERNATIONAL BUILDING CODE
   - B. INTERNATIONAL PLUMBING CODE
   - C. INTERNATIONAL MECHANICAL CODE
   - D. NATIONAL ELECTRIC CODE (NFPA 70)
   - E. THE LIFE SAFETY CODE (NFPA 101)
   - F. NATIONAL FUEL GAS CODE (NFPA 54)
   - G. LIQUEFIED PETROLEUM GAS CODE (NFPA 58)
   - H. CONNECTICUT GAS AND EQUIPMENT PIPING CODE
7. PERMITS AND FEES: THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS; AND PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS, INCLUDING UTILITY CONNECTIONS OR EXTENSIONS IN CONNECTION WITH THE WORK, FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION, OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.
8. SHOP DRAWINGS:
   - A. SUBMIT NEWLY PREPARED INFORMATION, DRAWN TO ACCURATE SCALE OF 1/4"=1'0". HIGHLIGHT, ENCIRCLE, OR OTHERWISE INDICATE DEVIATIONS FROM THE CONTRACT DOCUMENTS. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION AS THE BASIS OF SHOP DRAWINGS. STANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS.
   - B. SHOP DRAWINGS INCLUDE EQUIPMENT SUBMITTALS, FABRICATION AND INSTALLATION DRAWINGS, SETTING DIAGRAMS, SCHEDULES, PATTERNS, TEMPLATES AND SIMILAR DRAWINGS. INCLUDE THE FOLLOWING INFORMATION:
     - a. DIMENSIONS.
     - b. IDENTIFICATION OF PRODUCTS AND MATERIALS INCLUDED.
     - c. COMPLIANCE WITH SPECIFIED STANDARDS AND PERFORMANCE DATA AS INDICATED.
     - d. NOTATION OF COORDINATION REQUIREMENTS.
     - e. NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT.
     - f. SUBMIT 3 BLACK-LINE PRINTS AND 2 ADDITIONAL PRINTS WHERE REQUIRED FOR MAINTENANCE MANUALS, PLUS THE NUMBER OF PRINTS NEEDED BY THE ENGINEER FOR DISTRIBUTION. ONE PRINT WILL BE RETAINED; THE REMAINDER RETURNED. ONE OF THE PRINTS RETURNED SHALL BE MARKED-UP AND MAINTAINED AS A "RECORD DOCUMENT".
     - g. DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.
     - h. DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SHOP DRAWINGS.
     - i. PROVIDE SUBMITTALS AS INDICATED IN SPECIFIC SPECIFICATION SECTIONS.
9. USE ADEQUATE NUMBERS OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK.
10. THE CONTRACTOR SHALL COORDINATE ALL INTERRUPTIONS OF SERVICES AND LIMITATIONS OF ACCESS WITH THE OWNER NO LESS THAN 5 DAYS PRIOR TO THE INTERRUPTION.
11. OPERATION AND MAINTENANCE
    - A. UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE OWNER OR THE OWNER'S REPRESENTATIVE IN THE OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL EQUIPMENT FURNISHED. THE CONTRACTOR SHALL GIVE AT LEAST SEVEN (7) DAYS NOTICE TO THE OWNER AND THE ENGINEER IN ADVANCE OF THIS PERIOD.
    - B. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.
    - C. OPERATION AND MAINTENANCE MANUAL SHALL INCLUDE THE FOLLOWING:
      - a. MANUFACTURER'S PRINTED OPERATING AND MAINTENANCE PROCEDURES.
      - b. MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING.
      - c. COPIES OF WARRANTIES.
      - d. APPROVED SHOP DRAWINGS AND PRODUCT DATA.
      - e. BALANCE REPORTS.
      - f. INCLUDE IN THE MANUAL, A TABULATED EQUIPMENT SCHEDULE FOR ALL EQUIPMENT. SCHEDULE SHALL INCLUDE PERTINENT DATA SUCH AS: MAKE, MODEL NUMBER, SERIAL NUMBER, VOLTAGE, NORMAL OPERATING CURRENT, BELT SIZE, FILTER QUANTITIES AND SIZES, BEARING NUMBER, ETC. SCHEDULE SHALL INCLUDE MAINTENANCE TO BE DONE AND FREQUENCY.
      - g. MAINTENANCE AND INSTRUCTION MANUALS SHALL BE SUBMITTED TO THE OWNER AT THE SAME TIME AS THE SEVEN (7) DAY NOTICE IS GIVEN PRIOR TO THE INSTRUCTION PERIOD.
12. AS-BUILT DRAWINGS
    - A. PREPARE AS-BUILT DRAWINGS TO A SCALE OF 1/4"=1'-0" OR LARGER; DETAILING THE ACTUAL INSTALLATION OF MAJOR ELEMENTS, COMPONENTS, AND SYSTEMS OF MECHANICAL EQUIPMENT AND MATERIALS. WHERE SHOP DRAWINGS ARE USED, RECORD A CROSS-REFERENCE AT THE CORRESPONDING LOCATION ON THE AS-BUILT DRAWINGS. GIVE PARTICULAR ATTENTION TO CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO MEASURE AND RECORD AT A LATER DATE.
    - B. MARK NEW INFORMATION THAT IS IMPORTANT TO THE OWNER, BUT WAS NOT SHOWN ON CONTRACT DRAWINGS OR SHOP DRAWINGS.
    - C. NOTE RELATED CHANGE ORDER NUMBERS WHERE APPLICABLE.
    - D. ORGANIZE AS-BUILT DRAWINGS INTO MANAGEABLE SETS, BIND WITH DURABLE PAPER COVER SHEETS, AND PRINT SUITABLE TITLES, DATES AND OTHER IDENTIFICATION ON THE COVER OF EACH SET.
13. OBTAIN IN OWNER'S NAME WRITTEN EQUIPMENT AND MATERIAL WARRANTIES OFFERED IN MANUFACTURER'S PUBLISHED PRODUCT DATA WITHOUT EXCLUSION OR LIMITATION.
14. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.
15. SUBMIT TO THE OWNER AN OFFICIAL CERTIFICATE OF INSURANCE FOR THEIR RECORDS.

MEANS AND METHODS ALL TRADES

1. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS
2. DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNER'S PROPERTY. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.
3. MATERIALS AND EQUIPMENT SHALL BE UL LISTED WHERE STANDARD HAS BEEN ESTABLISHED.
4. CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS. PATCH AND PAINT SURFACES DISTURBED BY WORK UNDER THIS CONTRACT AS REQUIRED TO RESTORE THEM TO THEIR ORIGINAL CONDITION.
5. SCAFFOLDING, RIGGING, HOISTING: THE CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES ANY EQUIPMENT AND APPARATUS FURNISHED UNDER THIS DIVISION. REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.
6. EXCAVATION AND BACKFILLING: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE SIZES, DEPTHS, FILL AND BEDDING REQUIREMENTS AND ANY OTHER EXCAVATION WORK REQUIRED UNDER THESE SPECIFICATIONS
7. WATERPROOFING: WHERE ANY WORK PIERCES WATERPROOFING, INCLUDING WATERPROOF CONCRETE, ROOFS, EXTERIOR WALL AND FLOORS IN WET AREAS, THE METHOD OF INSTALLATION SHALL BE REVIEWED BY THE ENGINEER BEFORE WORK IS DONE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY SLEEVES, CAULKING AND FLASHING REQUIRED TO MAKE OPENINGS ABSOLUTELY WATERTIGHT.
8. PROVIDE FIRESTOPPING AROUND ALL FIRE PROTECTION, PLUMBING, MECHANICAL AND ELECTRICAL PENETRATIONS THROUGH FIRE RATED PARTITIONS. PROVIDE ASBESTOS FREE FIRESTOPPING SYSTEM CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME AND GASES. SYSTEM SHALL BE UL LISTED AND COMPLY WITH ASTM E 814.
9. ACCESS DOORS SHALL BE PROVIDED IN CEILINGS, WALLS AND FLOORS AT ALL DAMPERS, VALVES, CONTROL DEVICES, AND OTHER APPARATUS AND EQUIPMENT REQUIRING PERIODIC SERVICE AND INSPECTION. COORDINATE TYPE AND LOCATION WITH ARCHITECTURAL PLANS.
10. SEISMIC RESTRAINTS SHALL BE INSTALLED AS REQUIRED PER BUILDING CODE AND FIRE SAFETY CODE. RESTRAINTS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 13 AND SMACNA STANDARDS. SUBMIT SHOP DRAWINGS INCLUDING SEISMIC CALCULATIONS WITH PROFESSIONAL ENGINEER'S SEAL FOR REVIEW BY ENGINEER.

PLUMBING

1. PIPING:
   - A. NATURAL GAS AND LP PIPING SHALL BE SCHEDULE 40, CARBON STEEL PIPE, WITH THREADED JOINTS AND FITTINGS OR TYPE L COPPER TUBING.
2. INSULATION:
   - A. INSULATION SHALL BE IN ACCORDANCE WITH LATEST EDITION OF ASHRAE 90.1 EXCEPT THAT PIPE INSULATION SHALL NOT BE LESS THAN 1" THICK. ALL INSULATION MATERIALS, ADHESIVES, COATINGS, AND OTHER ACCESSORIES SHALL HAVE FLAME SPREAD RATINGS OF 25 OR LESS, AND SMOKE DEVELOPED RATINGS OF 50 OR LESS AS TESTED BY ASTM E 84 (NFPA 255) METHOD. ALL INSULATION MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA AND ASHRAE STANDARDS.
3. PIPING INSTALLATION:
   - A. INSTALL PIPING IN ACCORDANCE WITH ALL APPLICABLE CODES AND GOOD PRACTICES.
   - B. INSTALL UNIONS OR FLANGES IN PIPES ADJACENT TO EACH VALVE, CONTROL DEVICE AND AT FINAL CONNECTIONS EACH PIECE OF EQUIPMENT.
   - C. INSTALL DIELECTRIC UNIONS TO JOIN DISSIMILAR METALS.
   - D. INSTALL AND ANCHOR PIPING TO ENSURE PROPER EXPANSION AND CONTRACTION.
   - E. ANCHOR PIPING TO ENSURE PROPER DIRECTION OF EXPANSION AND CONTRACTION.
   - F. SUPPORT PIPING TO PREVENT VIBRATION OR SAGGING. PROVIDE HANGER SPACING ACCORDING TO DISTANCES LISTED IN APPLICABLE CODES AND REGULATIONS.
   - G. COORDINATE ALL NATURAL GAS CONNECTIONS AND INSTALLATIONS WITH LOCAL GAS COMPANY. CONFIRM SIZES AND PRESSURES ARE ADEQUATE FOR EQUIPMENT BEING SPECIFIED AND VERIFY EXISTING DISTRIBUTION DOES NOT NEED TO BE UPGRADED TO HANDLE NEW EQUIPMENT LOAD.
4. PLUMBING IDENTIFICATION
   - A. PLUMBING IDENTIFICATION WORK SHALL COMPLY WITH ANSI A13.1. NAMES, ABBREVIATIONS AND OTHER DESIGNATIONS USED IN MECHANICAL IDENTIFICATION WORK, SHALL CORRESPOND WITH DESIGNATIONS SHOWN. SPECIFIED OR SCHEDULED.
   - B. VALVE TAGS SHALL BE 1-1/2' DIAMETER, 19-GAGE POLISHED BRASS WITH STAMP-ENGRAVED LETTERING. ATTACH VALVES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
   - C. PROVIDE VALVE TAG ON EVERY VALVE, EXCLUDING DRAIN VALVES.
   - D. PIPE IDENTIFICATION, PLASTIC PIPE MARKERS, FACTORY FABRICATED, FLEXIBLE, SEMI-RIGID PLASTIC. PERFORMED TO FIT AROUND PIPE OR PIPE COVERING, MINIMUM INFORMATION INDICATING FLOW DIRECTION ARROW AND IDENTIFICATION OF FLUID BEING CONVEYED.
5. TESTING AND. ADJUSTING
   - A. ALL WATER PIPING SHALL BE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE. THE SYSTEM SHALL BE PROVED TIGHT UNDER WATER PRESSURE OF 100 PSIG. THE PRESSURE SHALL BE APPLIED GRADUALLY AND THEN HELD FOR A MINIMUM OF TWO HOURS.
   - B. ALL WASTE PIPING SHALL BE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE. THE SYSTEM SHALL BE FILLED WITH WATER TO A HEAD OF NOT LESS THAN 10 FEET. THE WATER LEVEL AT THE TOP OF THE TEST HEAD OF WATER SHALL NOT DROP FOR AT LEAST 15 MINUTES.
   - C. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT FOR ALL TESTING.



6 UNDERGROUND BURIED 1990 GALLON PROPANE TANK

SCALE: NTS

TANK SELECTION AND ACCESSORIES:
PROVIDE THE FOLLOWING ACCESSORIES WITH THE LP TANK
1. HOLD DOWN STRAPS

3. LADDERS TO COMPLY WITH OSHA SPECIFICATIONS.
4. MANWAY EXTENSIONS
5. GRADE LEVEL MANWAYS DESIGNED TO AASHTO H20 REQUIREMENTS.
6. OVERFILL CONTAINMENT CHAMBER
7. ALARM AND CONTROL PANELS COORDINATE WITH DIVISION 26 AND BMS.
8. LEAK DETECTORS COORDINATE WITH DIVISION 26 AND BMS
9. LEVEL SENSORS COORDINATE WITH DIVISION 26 AND BMS

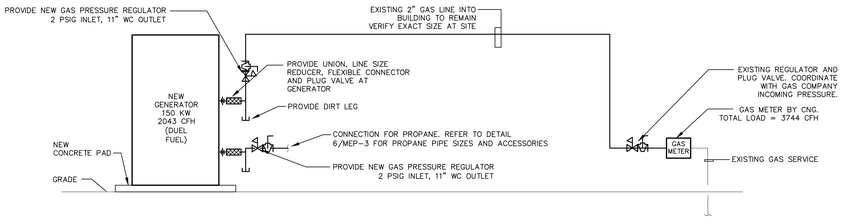
NOTES:
1. PROVIDE MINIMUM 1'-6" BURY OVER FUEL SUPPLY AND TANK.
2. STORAGE TANK & COMPLETED INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 58
3. TANK TO BE LOCATED MINIMUM OF 10 FEET FROM BUILDING AND PROPERTY LINE, 25 FEET FROM A WELL AND MAXIMUM OF 100 FEET FROM DRIVEWAY OR ROADWAY FOR DELIVERY.
4. PROVIDE SACRIFICIAL ANODE (MAGNESIUM BAG) INSTALL EVEN WITH BOTTOM.
5. COMPLETE INSTALLATION SHALL COMPLY WITH ALL APPLICABLE CODES.
6. ROUTE RELIEF VENTS AWAY FROM ANY SOURCE OF IGNITION.
7. PROVIDE FILL PIPING. ROUTE TO AN ACCESSIBLE LOCATION. LOCATION TO BE COORDINATED WITH SITE CIVIL ENGINEER.

PLUMBING ABBREVIATIONS

AD	ACCESS DOOR	LAV	LAVATORY
AWD	AREAWAY DRAIN	LPG	LIQUIFIED PETROLEUM GAS
AFF	ABOVE FINISHED FLOOR	MBH	THOUSAND BTU PER HOUR
AHU	AIR HANDLING UNIT	OD	OVERFLOW DRAIN
BFP	BACKFLOW PREVENTER	PCD	PUMPED CONDENSATE DRAIN
BTU	BRITISH THERMAL UNIT	PRV	PRESSURE REDUCING VALVE
CD	CONDENSATE DRAIN	PST	PRIMARY STORM
CFH	CUBIC FEET PER HOUR	RD	ROOF DRAIN
CI	CAST IRON	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
CLG	CEILING	RWL	RAIN WATER LEADER
CO	CLEANOUT	RTU	ROOF TOP UNIT
CW	COLD WATER	SAN	SANITARY
DF	DRINKING FOUNTAIN	SS	SOIL STACK
DN	DOWN	ST	STORM
DSN	DOWN SPOUT NOZZLE	SST	SECONDARY STORM
ET	EXPANSION TANK	TD	TRENCH DRAIN
EWC	ELECTRIC WATER COOLER	TMV	THERMOSTATIC MIXING VALVE
FCO	FLOOR CLEANOUT	TP	TRAP PRIMER
FCU	FAN COIL UNIT	TYP	TYPICAL
FLD	FLOOR DRAIN	U	URINAL
FLS	FLOOR SINK	UH	UNIT HEATER
FFE	FINISHED FLOOR ELEVATION	UFCW	UNFILTERED COLD WATER
FGCO	FINISHED GRADE CLEANOUT	V	VENT
FM	FORCED MAIN	VS	VENT STACK
GI	GREASE INTERCEPTOR	VTR	VENT THRU ROOF
GPM	GALLONS PER MINUTE	W	WASTE
GSV	GAS SOLENOID VALVE	WC	WATER CLOSET
GW	GREASE WASTE	WCO	WALL CLEANOUT
GV	GAS VENT	WHA	WATER HAMMER ARRESTOR
HB	HOSE BIBB	WHYD	WALL HYDRANT
HW	HOT WATER	WS	WASTE STACK
HWR	HOT WATER RECIRCULATION	W&V	WASTE AND VENT
INT	INTERCEPTOR	YH	YARD HYDRANT
IE	INVERT ELEVATION		
IW	INDIRECT WASTE		

PLUMBING SYMBOL LIST

SYMBOL	DESCRIPTION
⋈	PLUG VALVE
⋈	GAS PRESSURE REGULATOR
——G	GAS PIPING
▨	FLEXIBLE PIPING CONNECTOR
—‖—	UNION
◒	POINT OF CONNECTION – NEW TO EXISTING



4 SCHEMATIC GAS PIPING DIAGRAM

SCALE: NTS

CES
Consulting Engineering Services, Inc.
811 Middle Street
Middletown, CT 06457
Tel. (860) 632-1682
Fax. (860) 632-1768
CES #2015178.00

TOWN OF GLASTONBURY

2143 MAIN STREET
GLASTONBURY, CT 06033

REVISIONS

NO.	DATE	DESCRIPTION

POLICE STATION GENERATOR REPLACEMENT PROJECT: GL-2016-23

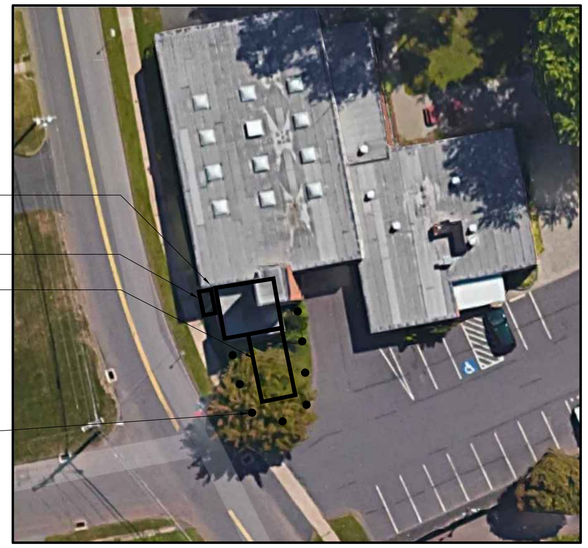
2108 MAIN STREET
GLASTONBURY, CT 06033

MEP SPECIFICATIONS

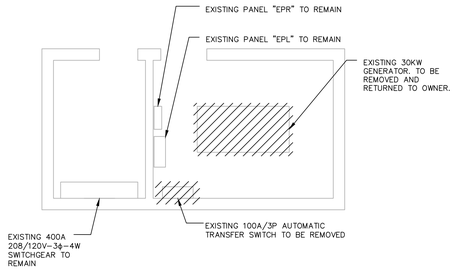
DATE: 7/15/15
PROJECT NO: 2015229.00
DRAWN: MFC
CHECKED: SAS
ISSUED FOR: CONSTRUCTION
REVISIONS:

SHEET NO.

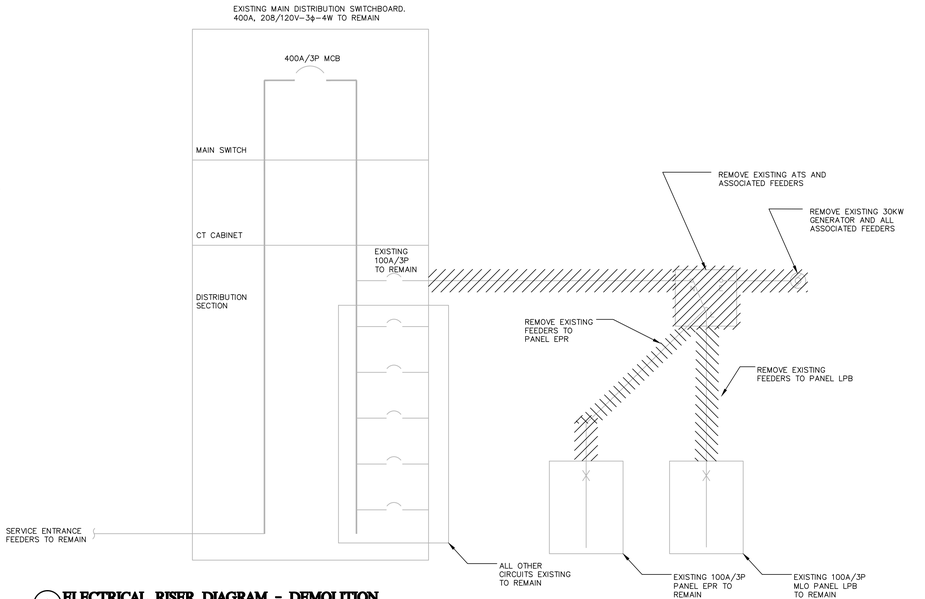
MEP-3



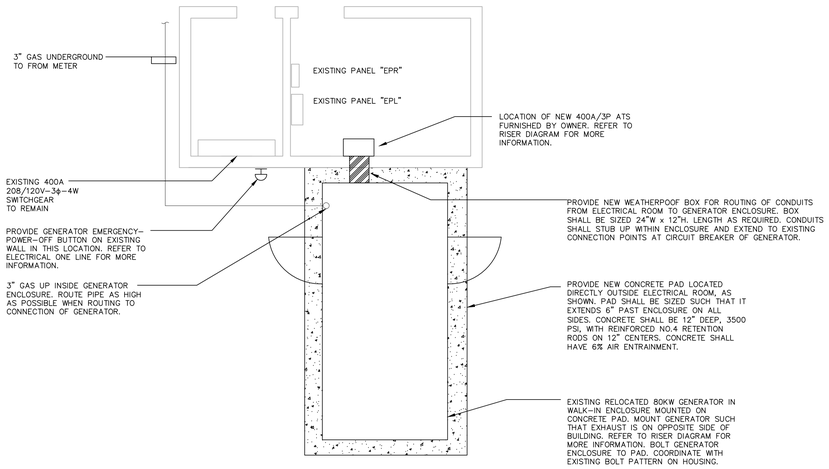
1 OVERALL SITE PLAN
SCALE: 1" = 20'



2 PART PLAN - ELECTRICAL ROOM DEMOLITION
SCALE: 1/8" = 1'

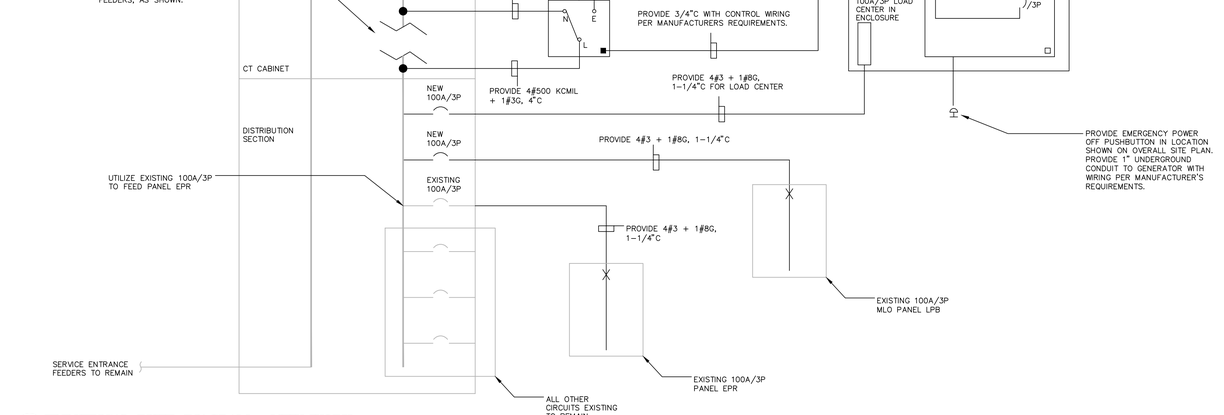


3 ELECTRICAL RISER DIAGRAM - DEMOLITON
N.T.S.

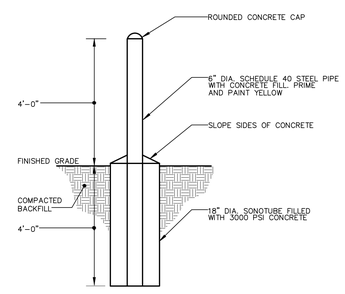


4 PART PLAN - ELECTRICAL ROOM NEW WORK
SCALE: 1/8" = 1'

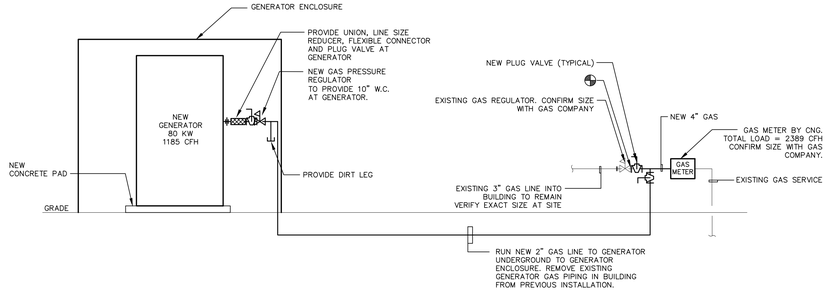
NOTE:
CONTRACTOR IS RESPONSIBLE FOR PHYSICALLY RELOCATING THE EXISTING GENERATOR INCLUSIVE OF ENCLOSURE, TRANSFER SWITCH, ANNUNCIATOR PANEL AND ALL ACCESSORIES FROM POLICE STATION (2108 MAIN STREET) PARKING LOT TO PAD AT THIS FIRE STATION. CONTRACTOR SHALL INSTALL GENERATOR AND ALL ACCESSORIES FOR COMPLETE OPERATION OF SYSTEMS AS INDICATED ON THESE DRAWINGS.



5 ELECTRICAL RISER DIAGRAM - NEW WORK
N.T.S.



6 CONCRETE BOLLARD DETAIL
SCALE: N.T.S.



7 SCHEMATIC GAS PIPING DIAGRAM - NEW WORK
SCALE: N.T.S.

CES
Consulting Engineering Services, Inc.
811 Middle Street
Middletown, CT 06457
Tel. (860) 632-1682
Fax. (860) 632-1768
CES #2015338.00

TOWN OF GLASTONBURY

2143 MAIN STREET
GLASTONBURY, CT 06033

REVISIONS

NO.	DATE	DESCRIPTION

FIRE DEPARTMENT GENERATOR REPLACEMENT PROJECT: GL-2016-23

2825 MAIN STREET
GLASTONBURY, CT 06033

MEP PLANS AND DETAILS

DATE:	7/15/15
PROJECT NO:	2015230.00
DRAWN:	MFC
CHECKED:	SAS
ISSUED FOR:	CONSTRUCTION
REVISIONS:	

SHEET NO.

MEP-1

GENERAL PLUMBING SPECIFICATIONS

PLUMBING SPECIFICATIONS

1. THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING DRAWINGS AND WORK UNLESS NOTED OTHERWISE.
2. DESCRIPTION
   A. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. THE EXISTING BUILDING IS CURRENTLY OCCUPIED AND THE PROJECT WILL PROCEED IN A MANNER WHICH WILL MINIMIZE ANY INCONVENIENCE TO THE BUILDING OCCUPANTS.
   B. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, PLANT, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND AS DESCRIBED HEREIN.
3. DEFINITIONS: THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT
   A. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."
   B. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
   C. PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
   D. REMOVE: THE TERM REMOVE MEANS TO DISCONNECTFROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."
   E. SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT.
4. DRAWINGS
   A. PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. THE CONTRACTOR IS TO NOTE THAT THESE DOCUMENTS ARE DIAGRAMMATIC ONLY AND THAT FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.
5. SURVEY AND MEASUREMENTS:
   A. PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK TO BE PERFORMED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL DEMOLITION WORK REQUIRED.
   B. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.
   C. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE.
   D. ARRANGE INSTALLATION TO PROVIDE ACCESS TO EQUIPMENT FOR EASY MAINTENANCE AND REPAIR.
6. CODES AND STANDARDS: ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST STATE OF CONNECTICUT ACCEPTED VERSION OF THE FOLLOWING
   A. INTERNATIONAL BUILDING CODE
   B. INTERNATIONAL PLUMBING CODE
   C. INTERNATIONAL MECHANICAL CODE
   D. NATIONAL ELECTRIC CODE (NFPA 70)
   E. THE LIFE SAFETY CODE (NFPA 101)
   F. NATIONAL FUEL GAS CODE (NFPA 54)
   G. LIQUEFIED PETROLEUM GAS CODE (NFPA 58)
   H. CONNECTICUT GAS AND EQUIPMENT PIPING CODE
7. PERMITS AND FEES: THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS; AND PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS, INCLUDING UTILITY CONNECTIONS OR EXTENSIONS IN CONNECTION WITH THE WORK, FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION, OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.
8. SHOP DRAWINGS:
   A. SUBMIT NEWLY PREPARED INFORMATION, DRAWN TO ACCURATE SCALE OF 1/4"=1'0". HIGHLIGHT, ENCIRCLE, OR OTHERWISE INDICATE DEVIATIONS FROM THE CONTRACT DOCUMENTS. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION AS THE BASIS OF SHOP DRAWINGS. STANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS.
   B. SHOP DRAWINGS INCLUDE EQUIPMENT SUBMITTALS, FABRICATION AND INSTALLATION DRAWINGS, SETTING DIAGRAMS, SCHEDULES, PATTERNS, TEMPLATES AND SIMILAR DRAWINGS. INCLUDE THE FOLLOWING INFORMATION:
      a. DIMENSIONS.
      b. IDENTIFICATION OF PRODUCTS AND MATERIALS INCLUDED.
      c. COMPLIANCE WITH SPECIFIED STANDARDS AND PERFORMANCE DATA AS INDICATED.
      d. NOTATION OF COORDINATION REQUIREMENTS.
      e. NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT.
      f. SUBMIT 3 BLACK-LINE PRINTS AND 2 ADDITIONAL PRINTS WHERE REQUIRED FOR MAINTENANCE MANUALS, PLUS THE NUMBER OF PRINTS NEEDED BY THE ENGINEER FOR DISTRIBUTION. ONE PRINT WILL BE RETAINED; THE REMAINDER RETURNED. ONE OF THE PRINTS RETURNED SHALL BE MARKED-UP AND MAINTAINED AS A "RECORD DOCUMENT".
      g. DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.
      h. DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SHOP DRAWINGS.
      i. PROVIDE SUBMITTALS AS INDICATED IN SPECIFIC SPECIFICATION SECTIONS.
9. USE ADEQUATE NUMBERS OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK.
10. THE CONTRACTOR SHALL COORDINATE ALL INTERRUPTIONS OF SERVICES AND LIMITATIONS OF ACCESS WITH THE OWNER NO LESS THAN 5 DAYS PRIOR TO THE INTERRUPTION.
11. OPERATION AND MAINTENANCE
   A. UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE OWNER OR THE OWNER'S REPRESENTATIVE IN THE OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL EQUIPMENT FURNISHED. THE CONTRACTOR SHALL GIVE AT LEAST SEVEN (7) DAYS NOTICE TO THE OWNER AND THE ENGINEER IN ADVANCE OF THIS PERIOD.
   B. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.
   C. OPERATION AND MAINTENANCE MANUAL SHALL INCLUDE THE FOLLOWING:
      a. MANUFACTURER'S PRINTED OPERATING AND MAINTENANCE PROCEDURES.
      b. MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING.
      c. COPIES OF WARRANTIES.
      d. APPROVED SHOP DRAWINGS AND PRODUCT DATA.
      e. BALANCE REPORTS.
      f. INCLUDE IN THE MANUAL, A TABULATED EQUIPMENT SCHEDULE FOR ALL EQUIPMENT. SCHEDULE SHALL INCLUDE PERTINENT DATA SUCH AS: MAKE, MODEL NUMBER, SERIAL NUMBER, VOLTAGE, NORMAL OPERATING CURRENT, BELT SIZE, FILTER QUANTITIES AND SIZES, BEARING NUMBER, ETC. SCHEDULE SHALL INCLUDE MAINTENANCE TO BE DONE AND FREQUENCY.
      g. MAINTENANCE AND INSTRUCTION MANUALS SHALL BE SUBMITTED TO THE OWNER AT THE SAME TIME AS THE SEVEN (7) DAY NOTICE IS GIVEN PRIOR TO THE INSTRUCTION PERIOD.
12. AS-BUILT DRAWINGS
   A. PREPARE AS-BUILT DRAWINGS TO A SCALE OF 1/4"=1'-0" OR LARGER; DETAILING THE ACTUAL INSTALLATION OF MAJOR ELEMENTS, COMPONENTS, AND SYSTEMS OF MECHANICAL EQUIPMENT AND MATERIALS. WHERE SHOP DRAWINGS ARE USED, RECORD A CROSS-REFERENCE AT THE CORRESPONDING LOCATION ON THE AS-BUILT DRAWINGS. GIVE PARTICULAR ATTENTION TO CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO MEASURE AND RECORD AT A LATER DATE.
   B. MARK NEW INFORMATION THAT IS IMPORTANT TO THE OWNER, BUT WAS NOT SHOWN ON CONTRACT DRAWINGS OR SHOP DRAWINGS.
   C. NOTE RELATED CHANGE ORDER NUMBERS WHERE APPLICABLE.
   D. ORGANIZE AS-BUILT DRAWINGS INTO MANAGEABLE SETS, BIND WITH DURABLE PAPER COVER SHEETS, AND PRINT SUITABLE TITLES, DATES AND OTHER IDENTIFICATION ON THE COVER OF EACH SET.
13. OBTAIN IN OWNER'S NAME WRITTEN EQUIPMENT AND MATERIAL WARRANTIES OFFERED IN MANUFACTURER'S PUBLISHED PRODUCT DATA WITHOUT EXCLUSION OR LIMITATION.
14. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.
15. SUBMIT TO THE OWNER AN OFFICIAL CERTIFICATE OF INSURANCE FOR THEIR RECORDS.

MEANS AND METHODS ALL TRADES

1. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS
2. DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNER'S PROPERTY. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.
3. MATERIALS AND EQUIPMENT SHALL BE UL LISTED WHERE STANDARD HAS BEEN ESTABLISHED.
4. CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS. PATCH AND PAINT SURFACES DISTURBED BY WORK UNDER THIS CONTRACT AS REQUIRED TO RESTORE THEM TO THEIR ORIGINAL CONDITION.
5. SCAFFOLDING, RIGGING, HOISTING: THE CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES ANY EQUIPMENT AND APPARATUS FURNISHED UNDER THIS DIVISION. REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.
6. EXCAVATION AND BACKFILLING: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE SIZES, DEPTHS, FILL AND BEDDING REQUIREMENTS AND ANY OTHER EXCAVATION WORK REQUIRED UNDER THESE SPECIFICATIONS
7. WATERPROOFING: WHERE ANY WORK PIERCES WATERPROOFING, INCLUDING WATERPROOF CONCRETE, ROOFS, EXTERIOR WALL AND FLOORS IN WET AREAS, THE METHOD OF INSTALLATION SHALL BE REVIEWED BY THE ENGINEER BEFORE WORK IS DONE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY SLEEVES, CAULKING AND FLASHING REQUIRED TO MAKE OPENINGS ABSOLUTELY WATERTIGHT.
8. PROVIDE FIRESTOPPING AROUND ALL FIRE PROTECTION, PLUMBING, MECHANICAL AND ELECTRICAL PENETRATIONS THROUGH FIRE RATED PARTITIONS. PROVIDE ASBESTOS FREE FIRESTOPPING SYSTEM CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME AND GASES. SYSTEM SHALL BE UL LISTED AND COMPLY WITH ASTM E 814.
9. ACCESS DOORS SHALL BE PROVIDED IN CEILINGS, WALLS AND FLOORS AT ALL DAMPERS, VALVES, CONTROL DEVICES, AND OTHER APPARATUS AND EQUIPMENT REQUIRING PERIODIC SERVICE AND INSPECTION. COORDINATE TYPE AND LOCATION WITH ARCHITECTURAL PLANS.
10. SEISMIC RESTRAINTS SHALL BE INSTALLED AS REQUIRED PER BUILDING CODE AND FIRE SAFETY CODE. RESTRAINTS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 13 AND SMACNA STANDARDS. SUBMIT SHOP DRAWINGS INCLUDING SEISMIC CALCULATIONS WITH PROFESSIONAL ENGINEER'S SEAL FOR REVIEW BY ENGINEER.

PLUMBING

1. PIPING:
   A. NATURAL GAS AND LP PIPING SHALL BE SCHEDULE 40, CARBON STEEL PIPE, WITH THREADED JOINTS AND FITTINGS OR TYPE L COPPER TUBING.
2. INSULATION:
   A. INSULATION SHALL BE IN ACCORDANCE WITH LATEST EDITION OF ASHRAE 90.1 EXCEPT THAT PIPE INSULATION SHALL NOT BE LESS THAN 1" THICK. ALL INSULATION MATERIALS, ADHESIVES, COATINGS, AND OTHER ACCESSORIES SHALL HAVE FLAME SPREAD RATINGS OF 25 OR LESS, AND SMOKE DEVELOPED RATINGS OF 50 OR LESS AS TESTED BY ASTM E 84 (NFPA 255) METHOD. ALL INSULATION MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA AND ASHRAE STANDARDS.
3. PIPING INSTALLATION:
   A. INSTALL PIPING IN ACCORDANCE WITH ALL APPLICABLE CODES AND GOOD PRACTICES.
   B. INSTALL UNIONS OR FLANGES IN PIPES ADJACENT TO EACH VALVE, CONTROL DEVICE AND AT FINAL CONNECTIONS EACH PIECE OF EQUIPMENT.
   C. INSTALL DIELECTRIC UNIONS TO JOIN DISSIMILAR METALS.
   D. INSTALL AND ANCHOR PIPING TO ENSURE PROPER EXPANSION AND CONTRACTION.
   E. ANCHOR PIPING TO ENSURE PROPER DIRECTION OF EXPANSION AND CONTRACTION.
   F. SUPPORT PIPING TO PREVENT VIBRATION OR SAGGING. PROVIDE HANGER SPACING ACCORDING TO DISTANCES LISTED IN APPLICABLE CODES AND REGULATIONS.
   G. COORDINATE ALL NATURAL GAS CONNECTIONS AND INSTALLATIONS WITH LOCAL GAS COMPANY. CONFIRM SIZES AND PRESSURES ARE ADEQUATE FOR EQUIPMENT BEING SPECIFIED AND VERIFY EXISTING DISTRIBUTION DOES NOT NEED TO BE UPGRADED TO HANDLE NEW EQUIPMENT LOAD.
4. PLUMBING IDENTIFICATION
   A. PLUMBING IDENTIFICATION WORK SHALL COMPLY WITH ANSI A13.1. NAMES, ABBREVIATIONS AND OTHER DESIGNATIONS USED IN MECHANICAL IDENTIFICATION WORK, SHALL CORRESPOND WITH DESIGNATIONS SHOWN. SPECIFIED OR SCHEDULED.
   B. VALVE TAGS SHALL BE 1-1/2" DIAMETER, 19-GAGE POLISHED BRASS WITH STAMP-ENGRAVED LETTERING. ATTACH VALVES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
   C. PROVIDE VALVE TAG ON EVERY VALVE, EXCLUDING DRAIN VALVES.
   D. PIPE IDENTIFICATION, PLASTIC PIPE MARKERS, FACTORY FABRICATED, FLEXIBLE, SEMI-RIGID PLASTIC. PERFORMED TO FIT AROUND PIPE OR PIPE COVERING, MINIMUM INFORMATION INDICATING FLOW DIRECTION ARROW AND IDENTIFICATION OF FLUID BEING CONVEYED.
5. TESTING AND. ADJUSTING
   A. ALL WATER PIPING SHALL BE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE. THE SYSTEM SHALL BE PROVED TIGHT UNDER WATER PRESSURE OF 100 PSIG. THE PRESSURE SHALL BE APPLIED GRADUALLY AND THEN HELD FOR A MINIMUM OF TWO HOURS.
   B. ALL WASTE PIPING SHALL BE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE. THE SYSTEM SHALL BE FILLED WITH WATER TO A HEAD OF NOT LESS THAN 10 FEET. THE WATER LEVEL AT THE TOP OF THE TEST HEAD OF WATER SHALL NOT DROP FOR AT LEAST 15 MINUTES.
   C. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT FOR ALL TESTING.

PLUMBING ABBREVIATIONS

AD	ACCESS DOOR	LAV	LAVATORY
AWD	AREAWAY DRAIN	LPG	LIQUIFIED PETROLEUM GAS
AFF	ABOVE FINISHED FLOOR	MBH	THOUSAND BTU PER HOUR
AHU	AIR HANDLING UNIT	OD	OVERFLOW DRAIN
BFP	BACKFLOW PREVENTER	PCD	PUMPED CONDENSATE DRAIN
BTU	BRITISH THERMAL UNIT	PRV	PRESSURE REDUCING VALVE
CD	CONDENSATE DRAIN	PST	PRIMARY STORM
CFH	CUBIC FEET PER HOUR	RD	ROOF DRAIN
CI	CAST IRON	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
CLG	CEILING	RWL	RAIN WATER LEADER
CO	CLEANOUT	RTU	ROOF TOP UNIT
CW	COLD WATER	SAN	SANITARY
DF	DRINKING FOUNTAIN	SS	SOIL STACK
DN	DOWN	ST	STORM
DSN	DOWN SPOUT NOZZLE	SST	SECONDARY STORM
ET	EXPANSION TANK	TD	TRENCH DRAIN
EWC	ELECTRIC WATER COOLER	TMV	THERMOSTATIC MIXING VALVE
FCO	FLOOR CLEANOUT	TP	TRAP PRIMER
FCU	FAN COIL UNIT	TYP	TYPICAL
FLD	FLOOR DRAIN	U	URINAL
FLS	FLOOR SINK	UH	UNIT HEATER
FFE	FINISHED FLOOR ELEVATION	UFCW	UNFILTERED COLD WATER
FGCO	FINISHED GRADE CLEANOUT	V	VENT
FM	FORCED MAIN	VS	VENT STACK
GI	GREASE INTERCEPTOR	VTR	VENT THRU ROOF
GPM	GALLONS PER MINUTE	W	WASTE
GSV	GAS SOLENOID VALVE	WC	WATER CLOSET
GW	GREASE WASTE	WCO	WALL CLEANOUT
GV	GAS VENT	WHA	WATER HAMMER ARRESTOR
HB	HOSE BIBB	WHYD	WALL HYDRANT
HW	HOT WATER	WS	WASTE STACK
HWR	HOT WATER RECIRCULATION	W&V	WASTE AND VENT
INT	INTERCEPTOR	YH	YARD HYDRANT
IE	INVERT ELEVATION		
IW	INDIRECT WASTE		

PLUMBING SYMBOL LIST

SYMBOL	DESCRIPTION
	PLUG VALVE
	GAS PRESSURE REGULATOR
G	GAS PIPING
	FLEXIBLE PIPING CONNECTOR
	UNION
	POINT OF CONNECTION – NEW TO EXISTING

GENERAL ELECTRICAL SPECIFICATIONS

1. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING SITE. THE EXISTING SITE IS CURRENTLY OCCUPIED AND THE PROJECT WILL PROCEED IN A MANNER WHICH WILL MINIMIZE ANY INCONVENIENCE TO THE OCCUPANTS.
2. PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK TO BE PERFORMED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL DEMOLITION WORK REQUIRED.
3. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, PLANT, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL ELECTRICAL WORK AS SHOWN ON THE DRAWINGS AS DESCRIBED HEREIN.
4. THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT:
   A. FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."
   B. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
   C. PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
   D. REMOVE: THE TERM "REMOVE" MEANS " TO DISCONNECT FROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."
5. PROVIDE ALL NECESSARY MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. THE CONTRACTOR IS TO NOTE THAT THESE DOCUMENTS ARE DIAGRAMMATIC ONLY AND THAT FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT IN WHICH IS SHOWN ON THE DRAWINGS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST STATE OF CONNECTICUT ACCEPTED REVISION OF THE NATIONAL ELECTRIC CODE (NEC), NFPA 70, NFPA 110, AND THE NFPA 101 LIFE SAFETY CODE.
7. OBTAIN IN OWNER'S NAME WRITTEN EQUIPMENT AND MATERIAL WARRANTIES OFFERED IN MANUFACTURER'S PUBLISHED PRODUCT DATA WITHOUT EXCLUSION OR LIMITATION.
8. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.
9. SUPPLY TO THE OWNER AN OFFICIAL CERTIFICATE OF INSURANCE FOR THEIR RECORDS.
10. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ARRANGING AND BEING AVAILABLE FOR INSPECTIONS BY THE AUTHORITY HAVING JURISDICTION.
11. USE ADEQUATE NUMBERS OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK.
12. ARRANGE INSTALLATION TO PROVIDE ACCESS TO EQUIPMENT FOR EASY MAINTENANCE AND REPAIR.
13. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.
14. MATERIALS AND EQUIPMENT SHALL BE UL LISTED WHERE STANDARD HAS BEEN ESTABLISHED.
15. DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNER'S PROPERTY. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.
16. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCE AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER HANDLING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE. CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS.
17. THE CONTRACTOR SHALL BE REQUIRED TO PROPERLY STORE MATERIALS AND EQUIPMENT SO AS TO AVOID THEFT OR VANDALISM. IF THEFT OR VANDALISM OCCURS, THE CONTRACTOR SHALL REPAIR OR REPLACE SUCH ITEMS AT THE DIRECTION OF THE ENGINEER.
18. GROUNDING SHALL BE COMPLETED IN ACCORDANCE WITH NFPA 70. GROUND EXPOSED, NON-CURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN METALLIC AND NONMETALLIC RACEWAYS, GROUNDING CONDUCTOR OF NONMETALLIC SHEATHED CABLES, AND NEUTRAL CONDUCTOR OF WIRING SYSTEMS. MAKE GROUND CONNECTION AT MAIN SERVICE EQUIPMENT, AND EXTEND GROUNDING CONDUCTOR TO POINT OF ENTRANCE OF METALLIC WATER SERVICE. MAKE CONNECTION TO WATER PIPE BY SUITABLE GROUND CLAMP WITH METER JUMPER OR LUG CONNECTION TO PLUGGED TEE. IF FLANGED PIPES ARE ENCOUNTERED, MAKE CONNECTION WITH LUG BOLTED TO STREET SIDE OF FLANGED CONNECTION. SUPPLEMENT METALLIC WATER SERVICE GROUNDING SYSTEM WITH ADDITIONAL MADE ELECTRODE IN COMPLIANCE WITH NFPA 70. WHERE GROUND FAULT PROTECTION IS EMPLOYED, ENSURE THAT CONNECTION OF GROUND AND NEUTRAL DOES NOT INTERFERE WITH CORRECT OPERATION OF FAULT PROTECTION.
19. CONDUCTORS NO. 8 AWG AND LARGER DIAMETER SHALL BE STRANDED ANNEALED COPPER. CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER SHALL BE SOLID ANNEALED COPPER, EXCEPT THAT CONDUCTORS FOR REMOTE CONTROL, ALARM, AND SIGNAL CIRCUITS, CLASSES 1, 2, AND 3, SHALL BE STRANDED UNLESS SPECIFICALLY INDICATED OTHERWISE. CONDUCTOR SIZES AND AMPACITIES SHOWN ARE BASED ON COPPER, UNLESS INDICATED OTHERWISE. UNLESS SPECIFIED OR INDICATED OTHERWISE OR REQUIRED BY NFPA 70, POWER AND LIGHTING WIRES SHALL BE 600-VOLT, TYPE THWN/THHN ANNEALED COPPER, REMOTE-CONTROL AND SIGNAL CIRCUITS SHALL BE TYPE TW, THW, OR TF ANNEALED COPPER. WHERE LIGHTING FIXTURES REQUIRE 90 DEGREES C CONDUCTORS, PROVIDE ONLY CONDUCTORS WITH 90 DEGREE C INSULATION OR BETTER.
20. MAKE ALL SPLICES IN ACCESSIBLE LOCATIONS. MAKE SPLICES IN CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER WITH INSULATED, PRESSURE-TYPE CONNECTOR. MAKE SPLICES IN CONDUCTORS NO. 8 AWG AND LARGER DIAMETER WITH SOLDERLESS CONNECTOR, AND COVER WITH INSULATION MATERIAL EQUIVALENT TO CONDUCTOR INSULATION.
21. PHASE CONDUCTORS SHALL BE IDENTIFIED BY COLOR CODING. THE COLOR OF THE INSULATION ON PHASES A, B, AND C RESPECTIVELY (FOR THREE PHASE) OR PHASES A AND B RESPECTIVELY (FOR SINGLE PHASE) OF DIFFERENT VOLTAGE SYSTEMS SHALL BE AS FOLLOWS: 120/208 VOLT, 3-PHASE: BLACK, RED, AND BLUE. 277/480 VOLT, 3-PHASE: BROWN, ORANGE, AND YELLOW. 120/240 VOLT, SINGLE/PHASE: BLACK AND RED. ON 3-PHASE, 4-WIRE DELTA SYSTEM, HIGH LEG SHALL BE ORANGE, AS REQUIRED BY NFPA 70.
22. UNLESS OTHERWISE INDICATED, THE WIRING METHOD SHALL CONSIST OF THE INSTALLATION OF INSULATED CONDUCTORS INSTALLED IN ELECTRICAL METALLIC CONDUIT. PROVIDE INSULATED, GREEN EQUIPMENT GROUNDING CONDUCTOR IN FEEDER AND BRANCH CIRCUITS, INSTALLED IN CONDUIT OR RACEWAYS. GROUNDING CONDUCTOR SHALL BE SEPARATE FROM ELECTRICAL SYSTEM NEUTRAL CONDUCTOR. METAL CONDUIT SHALL EXTEND THROUGH SHAFTS FOR MINIMUM DISTANCE OF 6 INCHES. CONDUIT SIZES SHOWN ARE BASED ON USE OF COPPER CONDUCTORS WITH INSULATION TYPES AS INDICATED HEREIN. IF THE USE OF ALUMINUM CONDUCTORS IS ALLOWED, THE CONTRACTOR SHALL UPSIZE ALL CONDUITS ACCORDING TO NFPA