Request for Proposal
RFP-4813-20-DH

Design/Build Grand Junction Bio Compressed Natural Gas (BioCNG) Storage and Fueling Station Optimization Project

RESPONSES DUE:
August 26, 2020 Prior to 3:30 PM MDT
Accepting Electronic Responses Only
Responses Only Submitted Through the Rocky Mountain E-Purchasing System (RMEPS)
https://www.rockymountainbidsystem.com/default.asp
(Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor MUST contact RMEPS to resolve issue prior to the response deadline. 800-835-4603)

PURCHASING REPRESENTATIVE:
Duane Hoff Jr., Senior Buyer
duaneh@gjcity.org
970-244-1545

This solicitation has been developed specifically for a Request for Proposal intended to solicit competitive responses for this solicitation, and may not be the same as previous City of Grand Junction solicitations. All offerors are urged to thoroughly review this solicitation prior to submitting. Submittal by **FAX, EMAIL or HARD COPY IS NOT ACCEPTABLE** for this solicitation.

REQUEST FOR PROPOSAL

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REQUEST FOR PROPOSAL

SECTION 1.0: ADMINISTRATIVE INFORMATION & CONDITIONS FOR SUBMITTAL

1.1 Issuing Office: This Request for Proposal (RFP) is issued by the City of Grand Junction. All contact regarding this RFP shall be directed to:

RFP Questions:
Duane Hoff Jr., Senior Buyer
duaneh@gjcity.org

1.2 Purpose: The purpose of this RFP is to obtain proposals from qualified and professional design-build firms/contractors specializing in the design, development, and construction of Bio Compressed Natural Gas (BioCNG) fueling facilities, to provide design services and construction of a low pressure biogas storage system at the Persigo Wastewater Treatment Plant and construction of improvements to the instrumentation and automation of a CNG fleet fueling station. Storage facility to be located at the Persigo WWTP, 2145 River Road, Grand Junction, CO. Automation and instrumentation located at City's Municipal Campus area at 333 West Avenue, Grand Junction, CO.

1.3 Recommended Pre-Proposal Virtual Meeting/Briefing: A pre-proposal virual meeting/briefing recommended for all prospective offerors. The purpose of this virtual meeting/briefing will be to inspect and to clarify the contents of this Request for Proposal (RFP). The virtual meeting/briefing shall take place on July 27, 2020 at 2:00pm. Nothing stated during the Virtual Meeting/Briefing will modify the solicitation. Only information provided in an addendum can modify the solicitation.

The virtual meeting will be hosted via **Microsoft Teams** and attendees shall participate remotely. The link for the virtual meeting is below.

https://teams.microsoft.com/dl/launcher/launcher.html?url=%2f_%23%2fl%2fmeetup-join%2f19%3ameeting_YmVjMWU2ZDUtNjRlNC00Nzc2LWJjMzAtOTVhZDJkMDBhNTZk%40thread.v2%2f0%3fcontext%3d%257b%2522Tid%2522%253a%25228d207e5d-3faa-4a17-8389-db5747bc379c%2522%252c%2522Oid%2522%253a%252227bd0506-8294-424d-891e-42a0f92aae16%2522%257d%26anon%3dtrue&type=meetup-join&deeplinkId=5a2f879f-f73b-49ef-bf1c-a86686c4f899&directDl=true&msLaunch=true&enableMobilePage=true&suppressPrompt=true&promptSuccess=true

1.4 The Owner: The Owner is the City of Grand Junction, Colorado and is referred to throughout this Solicitation. The term Owner means the Owner or his authorized representative.

1.5 Procurement Process: Procurement processes shall be governed by the most current version of the City of Grand Junction Purchasing Policy and Procedure Manual.

1.6 Compliance: All participating Offerors, by their signature hereunder, shall agree to comply with all conditions, requirements, and instructions of this RFP as stated or implied herein. Should the Owner omit anything from this packet which is necessary to the clear understanding of the requirements, or should it appear that various instructions are in

conflict, the Offeror(s) shall secure instructions from the Purchasing Division prior to the date and time of the submittal deadline shown in this RFP.

1.7 Submission: Please refer to section 5.0 for what is to be included. ***Each proposal shall be submitted in electronic format only, and only through the Rocky Mountain E-Purchasing website (https://www.rockymountainbidsystem.com/default.asp).*** *This site offers both "free" and "paying" registration options that allow for full access of the Owner's documents and for electronic submission of proposals. (Note: "free" registration may take up to 24 hours to process. Please Plan accordingly.)* Please view our "**Electronic Vendor Registration Guide"** at http://www.gjcity.org/business-and-economic-development/bids/ for details. For proper comparison and evaluation, the City requests that proposals be formatted as directed in Section 5.0 "Preparation and Submittal of Proposals." Submittals received that fail to follow this format may be ruled non-responsive. (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline. **800-835-4603**)

1.8 Altering Proposals: Any alterations made prior to opening date and time must be initialed by the signer of the proposal, guaranteeing authenticity. Proposals cannot be altered or amended after submission deadline.

1.9 Withdrawal of Proposal: A proposal must be firm and valid for award and may not be withdrawn or canceled by the Offeror for sixty (60) days following the submittal deadline date, and only prior to award. The Offeror so agrees upon submittal of their proposal. After award this statement is not applicable.

1.10 Addenda: All Questions shall be submitted in writing to the appropriate person as shown in Section 1.1. Any interpretations, corrections and changes to this RFP or extensions to the opening/receipt date shall be made by a written Addendum to the RFP by the Owner. Sole authority to authorize addenda shall be vested in the City of Grand Junction Purchasing Representative. Addenda will be issued electronically through the Rocky Mountain E-Purchasing website at www.rockymountainbidsystem.com and http://www.gjcity.org/business-and-economic-development/bids/ Offerors shall acknowledge receipt of all addenda in their proposal.

1.11 Exceptions and Substitutions: All proposals meeting the intent of this RFP shall be considered for award. Offerors taking exception to the specifications shall do so at their own risk. The Owner reserves the right to accept or reject any or all substitutions or alternatives. When offering substitutions and/or alternatives, Offeror must state these exceptions in the section pertaining to that area. Exception/substitution, if accepted, must meet or exceed the stated intent and/or specifications. The absence of such a list shall indicate that the Offeror has not taken exceptions, and if awarded a contract, shall hold the Offeror responsible to perform in strict accordance with the specifications or scope of work contained herein.

1.12 Confidential Material: All materials submitted in response to this RFP shall ultimately become public record and shall be subject to inspection after contract award. "**Proprietary or Confidential Information"** is defined as any information that is not generally known to competitors and which provides a competitive advantage. Unrestricted disclosure of

proprietary information places it in the public domain. Only submittal information clearly identified with the words "***Confidential Disclosure***" and uploaded as a separate document shall establish a confidential, proprietary relationship. Any material to be treated as confidential or proprietary in nature must include a justification for the request. The request shall be reviewed and either approved or denied by the Owner. If denied, the proposer shall have the opportunity to withdraw its entire proposal, or to remove the confidential or proprietary restrictions. Neither cost nor pricing information nor the total proposal shall be considered confidential or proprietary

1.13 Response Material Ownership: All proposals become the property of the Owner upon receipt and shall only be returned to the proposer at the Owner's option. Selection or rejection of the proposal shall not affect this right. The Owner shall have the right to use all ideas or adaptations of the ideas contained in any proposal received in response to this RFP, subject to limitations outlined in the section titled "Confidential Material". Disqualification of a proposal does not eliminate this right.

1.14 Minimal Standards for Responsible Prospective Offerors: A prospective Offeror must affirmably demonstrate their responsibility. A prospective Offeror must meet the following requirements:

- Have adequate financial resources, or the ability to obtain such resources as required.
- Be able to comply with the required or proposed completion schedule.
- Have a satisfactory record of performance.
- Have a satisfactory record of integrity and ethics.
- Be otherwise qualified and eligible to receive an award and enter into a contract with the Owner.

1.15 Nonconforming Terms and Conditions: A proposal that includes terms and conditions that do not conform to the terms and conditions of this Request for Proposal is subject to rejection as non-responsive. The Owner reserves the right to permit the Offeror to withdraw nonconforming terms and conditions from its proposal prior to a determination by the Owner of non-responsiveness based on the submission of nonconforming terms and conditions

1.16 Open Records: All proposals shall be open for public inspection after the contract is awarded. Trade secrets and confidential information contained in the proposal so identified by offer as such shall be treated as confidential by the Owner to the extent allowable in the Open Records Act.

1.17 Sales Tax: City of Grand Junction is, by statute, exempt from the State Sales Tax and Federal Excise Tax; therefore, all fees shall not include taxes.

1.18 Public Opening: Proposals shall be opened in the City Hall Auditorium, 250 North 5th Street, Grand Junction, CO 81501, immediately following the proposal deadline. Offerors, their representatives and interested persons may be present. Only the names and locations on the proposing firms will be disclosed.

SECTION 2.0: GENERAL CONTRACT TERMS AND CONDITIONS

2.1. Acceptance of RFP Terms: A proposal submitted in response to this RFP shall constitute a binding offer. Acknowledgment of this condition shall be indicated on the Cover Letter by the Offeror or an officer of the Offeror legally authorized to execute contractual obligations. A submission in response to the RFP acknowledges acceptance by the Offeror of all terms and conditions, as set forth herein. An Offeror shall identify clearly and thoroughly any variations between its proposal and the Owner's RFP requirements. Failure to do so shall be deemed a waiver of any rights to subsequently modify the terms of performance, except as outlined or specified in the RFP.

2.2. Execution, Correlation, Intent, and Interpretations: The Contract Documents shall be signed by the Owner and Contractor. By executing the contract, the Contractor represents that they have familiarized themselves with the local conditions under which the Work is to be performed and correlated their observations with the requirements of the Contract Documents. The Contract Documents are complementary, and what is required by any one, shall be as binding as if required by all. The intention of the documents is to include all labor, materials, equipment, services and other items necessary for the proper execution and completion of the scope of work as defined in the technical specifications and drawings contained herein. All drawings, specifications and copies furnished by the Owner are, and shall remain, Owner property. They are not to be used on any other project.

2.3. Permits, Fees, & Notices: The Contractor shall secure and pay for all permits, fees and licenses necessary for the proper execution and completion of the work. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the work. If the Contractor observes that any of the Contract Documents are at variance in any respect, Contractor shall promptly notify the Owner in writing, and any necessary changes shall be adjusted by change order/amendment. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, Contractor shall assume full responsibility and shall bear all costs attributable.

2.4. Warranty: The Contractor warrants to the Owner that all materials and equipment furnished under this contract will be new unless otherwise specified, and that all work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All work not so conforming to these standards may be considered defective. If required by Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. If within ten (10) days after written notice to the Contractor requesting such repairs or replacement, the Contractor should neglect to make or undertake with due diligence to the same, the City may make such repairs or replacements. All indirect and direct costs of such correction or removal or replacement shall be at the Contractor's expense. The Contractor will also bear the expenses of making good all work of others destroyed or damaged by the correction, removal or replacement of his defective work.

2.5. Quantities of Work and Unit Price: Materials or quantities stated as unit price items in the Bid are supplied only to give an indication of the general scope of the Work. The City does not expressly or by implication agree that the actual amount of Work or material will correspond therewith, and reserves the right after award to increase or decrease the

quantity of any unit item of the Work without a change in the unit price. The City also reserves the right to make changes in the Work including the right to delete any bid item in its entirety or add additional bid items.

2.6. Responsibility for those Performing the Work: The Contractor shall be responsible to the Owner for the acts and omissions of all their employees and all other persons performing any of the work under a contract with the Contractor.

2.7. Use of the Site: The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment.

2.8. Cleanup: The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by their operations. At the completion of work they shall remove all their waste materials and rubbish from and about the project, as well as all their equipment and surplus materials.

2.9. Payment & Completion: The Contract Sum is stated in the Contract and is the total amount payable by the Owner to the Contractor for the performance of the work under the Contract Documents. Upon receipt of written notice that the work is ready for final inspection and acceptance and upon receipt of application for payment, the Owner's Project Manager will promptly make such inspection and, when Owner finds the work acceptable under the Contract Documents and the Contract fully performed, the Owner shall make payment in the manner provided in the Contract Documents. Partial payments will be based upon estimates, prepared by the Contractor, of the value of Work performed and materials placed in accordance with the Contract Documents.

2.10. Bid Bond: Each Bid shall as a guaranty of good faith on the part of the Bidder be accompanied by a Bid Guaranty consisting of: a certified or cashier's check drawn on an approved national bank or trust company in the state of Colorado, and made payable without condition to the City; or a **Bid Bond** written by an approved corporate surety in favor of the City. The amount of the Bid Guaranty shall not be less than 5% of the total Bid amount. Once a Bid is accepted and a Contact is awarded, the apparent successful bidder has ten calendar days to enter into a contractor in the form prescribed and to furnish the bonds with a legally responsible and approved surety. Failure to do so will result I forfeiture of the Bid Guaranty to the City as Liquidated Damages.

Each bidder shall guaranty its total bid price for a period of sixty (60) Calendar Days from the date of the bid opening.

2.11. Performance & Payment Bonds: Contractor shall furnish a Performance and a Payment Bond, each in an amount at least equal to that specified for the contract amount as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These bonds shall remain in effect for the duration of the Warranty Period (as specified in the Special Conditions). Contractor shall also furnish other bonds that may be required by the Special Conditions. All bonds shall be in the forms prescribed by the Contract Documents and be executed by such sureties as (1) are licensed to conduct business in the State of Colorado and (2) are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as

Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Accounts, U.S. Treasury Department. All bonds singed by an agent must be accompanied by a certified copy of the Authority Act. If the surety on any bond furnished by the Contractor is declared bankrupt, or becomes insolvent, or its rights to do business in Colorado are terminated, or it ceases to meet the requirements of clauses (1) and (2) of this section, Contractor shall within five (5) days thereafter substitute another bond and surety, both of which shall be acceptable to the City.

2.12. Retention: The Owner will deduct money from the partial payments in amounts considered necessary to protect the interest of the Owner and will retain this money until after completion of the entire contract. The amount to be retained from partial payments will be five (5) percent of the value of the completed work, and not greater than five (5) percent of the amount of the Contract. When the retainage has reached five (5) percent of the amount of the Contract no further retainage will be made and this amount will be retained until such time as final payment is made.

2.13. Liquidated Damages for Failure to Meet Project Completion Schedule: If the Contractor does not achieve Final Completion by the required date, whether by neglect, refusal or any other reason, the parties agree and stipulate that the Contractor shall pay liquidated damages to the City for each such day that final completion is late. As provided elsewhere, this provision does not apply for delays caused by the City. The date for Final Completion may be extended in writing by the Owner.

The Contractor agrees that as a part of the consideration for the City's awarding of this Contract liquidated damages in the daily amount of $**1,000.00** is reasonable and necessary to pay for the actual damages resulting from such delay. The parties agree that the real costs and injury to the City for such delay include hard to quantify items such as: additional engineering, inspection and oversight by the City and its agents; additional contract administration; inability to apply the efforts of those employees to the other work of the City; perceived inefficiency of the City; citizens having to deal with the construction and the Work, rather than having the benefit of a completed Work, on time; inconvenience to the public; loss of reputation and community standing for the City during times when such things are very important and very difficult to maintain.

The Contractor must complete the Work and achieve final completion included under the Bid Schedule in the number of consecutive calendar days after the City gives is written Notice to Proceed. When the Contractor considers the entire Work ready for its intended use, Contractor shall certify in writing that the Work is substantially complete. In addition to the Work being substantially complete, Final Completion date is the date by which the Contractor shall have fully completed all clean-up, and all items that were identified by the City in the inspection for final completion. Unless otherwise stated in the Special Conditions, for purposes of this liquidated damages clause, the Work shall not be finished and the Contract time shall continue to accrue until the City gives its written Final Acceptance.

If the Contractor shall fail to pay said liquidated damages promptly upon demand thereof after having failed to achieve Final Completion on time, the City shall first look to any retainage or other funds from which to pay said liquidated damages; if retainage or other liquid funds are not available to pay said liquidated damages amounts, the Surety on the

Contractor's Performance Bond and Payment Bond shall pay such liquidated damages. In addition, the City may withhold all, or any part of, such liquidated damages from any payment otherwise due the Contractor.
Liquidated damages as provided do not include any sums to reimburse the City for extra costs which the City may become obligated to pay on other contracts which were delayed or extended because of the Contractor's failure to complete the Work within the Contract Time. Should the City incur additional costs because of delays or extensions to other contracts resulting from the Contractor's failure of timely performance, the Contractor agrees to pay these costs that the City incurs because of the Contractor's delay, and these payments are separate from and in addition to any liquidated damages.

The Contractor agrees that the City may use its own forces or hire other parties to obtain Substantial or Final Completion of the work if the time of completion has elapsed and the Contractor is not diligently pursuing completion. In addition to the Liquidated Damages provided for, the Contractor agrees to reimburse the City for all expenses thus incurred.

2.14. Contingency/Force Account: Contingency/Force Account work will be authorized by the Owner's Project Manager and is defined as minor expenses to cover miscellaneous or unforeseen expenses related to the project. The expenses are not included in the Drawings, Specifications, or Scope of Work and are necessary to accomplish the scope of this contract. Contingency/Force Account Authorization will be directed by the Owner through an approved form. Contingency/Force Account funds are the property of the Owner and any Contingency/Force Account funds, not required for project completion, shall remain the property of the Owner. Contractor is not entitled to any Contingency/Force Account funds, that are not authorized by Owner or Owner's Project Manager.

2.15. Protection of Persons & Property: The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. Contractor shall erect and maintain, as required by existing safeguards for safety and protection, and all reasonable precautions, including posting danger signs or other warnings against hazards promulgating safety regulations and notifying owners and users of adjacent utilities. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct by the Contractor in the execution of the work, or in consequence of the non-execution thereof by the Contractor, they shall restore, at their own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or it shall make good such damage or injury in an acceptable manner.

2.16. Changes in the Work: The Owner, without invalidating the contract, may order changes in the work within the general scope of the contract consisting of additions, deletions or other revisions. All such changes in the work shall be authorized by Change Order and shall be executed under the applicable conditions of the contract documents. A Change Order is a written order to the Contractor signed by the Owner issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or the contract time.

2.17. Minor Changes in the Work: The Owner shall have authority to order minor changes in the work not involving an adjustment in the contract sum or an extension of the contract time and not inconsistent with the intent of the contract documents.

2.18. Uncovering & Correction of Work: The Contractor shall promptly correct all work found by the Owner as defective or as failing to conform to the contract documents. The Contractor shall bear all costs of correcting such rejected work, including the cost of the Owner's additional services thereby made necessary. The Owner shall give such notice promptly after discovering of condition. All such defective or non-conforming work under the above paragraphs shall be removed from the site where necessary and the work shall be corrected to comply with the contract documents without cost to the Owner.

2.19. Acceptance Not Waiver: The Owner's acceptance or approval of any work furnished hereunder shall not in any way relieve the proposer of their present responsibility to maintain the high quality, integrity and timeliness of his work. The Owner's approval or acceptance of, or payment for, any services shall not be construed as a future waiver of any rights under this Contract, or of any cause of action arising out of performance under this Contract.

2.20. Change Order/Amendment: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders/amendments to the contract shall be made in writing by the Owner Purchasing Division.

2.21. Assignment: The Offeror shall not sell, assign, transfer or convey any contract resulting from this RFP, in whole or in part, without the prior written approval from the Owner.

2.22. Compliance with Laws: Proposals must comply with all Federal, State, County and local laws governing or covering this type of service and the fulfillment of all ADA (Americans with Disabilities Act) requirements. Contractor hereby warrants that it is qualified to assume the responsibilities and render the services described herein and has all requisite corporate authority and professional licenses in good standing, required by law.

2.23. Debarment/Suspension: The Contractor herby certifies that the Contractor is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Governmental department or agency.

2.24. Confidentiality: All information disclosed by the Owner to the Contractor for the purpose of the work to be done or information that comes to the attention of the Contractor during the course of performing such work is to be kept strictly confidential.

2.25. Conflict of Interest: No public official and/or Owner employee shall have interest in any contract resulting from this RFP.

2.26. Contract: This Request for Proposal, submitted documents, and any negotiations, when properly accepted by the Owner, shall constitute a contract equally binding between the Owner and Offeror. The contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements,

either written or oral, including the Proposal documents. The contract may be amended or modified with Change Orders, Field Orders, or Amendment.

2.27. Project Manager/Administrator: The Project Manager, on behalf of the Owner, shall render decisions in a timely manner pertaining to the work proposed or performed by the Offeror. The Project Manager shall be responsible for approval and/or acceptance of any related performance of the Scope of Work.

2.28. Cancelation of Solicitation: Any solicitation may be canceled by the Owner or any solicitation response by a vendor may be rejected in whole or in part when it is in the best interest of the Owner.

2.29. Contract Termination: This contract shall remain in effect until any of the following occurs: (1) contract expires; (2) completion of services; (3) acceptance of services or, (4) for convenience terminated by either party with a written *Notice of Cancellation* stating therein the reasons for such cancellation and the effective date of cancellation at least thirty days past notification.

2.30. Employment Discrimination: During the performance of any services per agreement with the Owner, the Offeror, by submitting a Proposal, agrees to the following conditions:

2.30.1. The Offeror shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, disability, citizenship status, marital status, veteran status, sexual orientation, national origin, or any legally protected status except when such condition is a legitimate occupational qualification reasonably necessary for the normal operations of the Offeror. The Offeror agrees to post in conspicuous places, visible to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

2.30.2. The Offeror, in all solicitations or advertisements for employees placed by or on behalf of the Offeror, shall state that such Offeror is an Equal Opportunity Employer.

2.30.3. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

2.31. Immigration Reform and Control Act of 1986 and Immigration Compliance: The Offeror certifies that it does not and will not during the performance of the contract employ illegal alien workers or otherwise violate the provisions of the Federal Immigration Reform and Control Act of 1986 and/or the immigration compliance requirements of State of Colorado C.R.S. § 8-17.5-101, *et.seq.* (House Bill 06-1343).

2.32. Ethics: The Offeror shall not accept or offer gifts or anything of value nor enter into any business arrangement with any employee, official, or agent of the Owner.

2.33. Failure to Deliver: In the event of failure of the Offeror to deliver services in accordance with the contract terms and conditions, the Owner, after due oral or written notice, may procure the services from other sources and hold the Offeror responsible for any costs

resulting in additional purchase and administrative services. This remedy shall be in addition to any other remedies that the Owner may have.

2.34. Failure to Enforce: Failure by the Owner at any time to enforce the provisions of the contract shall not be construed as a waiver of any such provisions. Such failure to enforce shall not affect the validity of the contract or any part thereof or the right of the Owner to enforce any provision at any time in accordance with its terms.

2.35. Force Majeure: The Offeror shall not be held responsible for failure to perform the duties and responsibilities imposed by the contract due to legal strikes, fires, riots, rebellions, and acts of God beyond the control of the Offeror, unless otherwise specified in the contract.

2.36. Indemnification: Offeror shall defend, indemnify and save harmless the Owner and all its officers, employees, insurers, and self-insurance pool, from and against all liability, suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the Offeror, or of any Offeror's agent, employee, subcontractor or supplier in the execution of, or performance under, any contract which may result from proposal award. Offeror shall pay any judgment with cost which may be obtained against the Owner growing out of such injury or damages.

2.37. Independent Firm: The Offeror shall be legally considered an Independent Firm and neither the Firm nor its employees shall, under any circumstances, be considered servants or agents of the Owner. The Owner shall be at no time legally responsible for any negligence or other wrongdoing by the Firm, its servants, or agents. The Owner shall not withhold from the contract payments to the Firm any federal or state unemployment taxes, federal or state income taxes, Social Security Tax or any other amounts for benefits to the Firm. Further, the Owner shall not provide to the Firm any insurance coverage or other benefits, including Workers' Compensation, normally provided by the Owner for its employees.

2.38. Ownership: All plans, prints, designs, concepts, etc., shall become the property of the Owner.

2.39. Oral Statements: No oral statement of any person shall modify or otherwise affect the terms, conditions, or specifications stated in this document and/or resulting agreement. All modifications to this request and any agreement must be made in writing by the Owner.

2.40. Patents/Copyrights: The Offeror agrees to protect the Owner from any claims involving infringements of patents and/or copyrights. In no event shall the Owner be liable to the Offeror for any/all suits arising on the grounds of patent(s)/copyright(s) infringement. Patent/copyright infringement shall null and void any agreement resulting from response to this RFP.

2.41. Remedies: The Offeror and Owner agree that both parties have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

2.42. Venue: Any agreement as a result of responding to this RFP shall be deemed to have been made in, and shall be construed and interpreted in accordance with, the laws of the City of Grand Junction, Mesa County, Colorado.

2.43. Expenses: Expenses incurred in preparation, submission and presentation of this RFP are the responsibility of the company and can not be charged to the Owner.

2.44. Sovereign Immunity: The Owner specifically reserves its right to sovereign immunity pursuant to Colorado State Law as a defense to any action arising in conjunction to this agreement.

2.45. Public Funds/Non-Appropriation of Funds: Funds for payment have been provided through the Owner's budget approved by the City Council/Board of County Commissioners for the stated fiscal year only. State of Colorado statutes prohibit the obligation and expenditure of public funds beyond the fiscal year for which a budget has been approved. Therefore, anticipated orders or other obligations that may arise past the end of the stated Owner's fiscal year shall be subject to budget approval. Any contract will be subject to and must contain a governmental non-appropriation of funds clause.

2.46. Collusion Clause: Each Offeror by submitting a proposal certifies that it is not party to any collusive action or any action that may be in violation of the Sherman Antitrust Act. Any and all proposals shall be rejected if there is evidence or reason for believing that collusion exists among the proposers. The Owner may or may not, at the discretion of the Owner Purchasing Representative, accept future proposals for the same service or commodities for participants in such collusion.

2.47. Gratuities: The Contractor certifies and agrees that no gratuities or kickbacks were paid in connection with this contract, nor were any fees, commissions, gifts or other considerations made contingent upon the award of this contract. If the Contractor breaches or violates this warranty, the Owner may, at their discretion, terminate this contract without liability to the Owner.

2.48. OSHA Standards: All Offerors agree and warrant that services performed in response to this invitation shall conform to the standards declared by the US Department of Labor under the Occupational Safety and Health Act of 1970 (OSHA). In the event the services do not conform to OSHA Standards, the Owner may require the services to be redone at no additional expense to the Owner.

2.49. Performance of the Contract: The Owner reserves the right to enforce the performance of the contract in any manner prescribed by law or deemed to be in the best interest of the Owner in the event of breach or default of resulting contract award.

2.50. Benefit Claims: The Owner shall not provide to the Contractor any insurance coverage or other benefits, including Worker's Compensation, normally provided by the Owner for its employees.

2.51. Default: The Owner reserves the right to terminate the contract immediately in the event the Contractor fails to meet delivery or completion schedules, or otherwise perform in accordance with the accepted proposal. Breach of contract or default authorizes the Owner

to purchase like services elsewhere and charge the full increase in cost to the defaulting Contractor.

2.52. Multiple Offers: Proposers must determine for themselves which product or service to offer. If said proposer chooses to submit more than one offer, THE ALTERNATE OFFER must be clearly marked "Alternate Proposal". The Owner reserves the right to make award in the best interest of the Owner.

2.53. Cooperative Purchasing: Purchases as a result of this solicitation are primarily for the Owner. Other governmental entities may be extended the opportunity to utilize the resultant contract award with the agreement of the successful provider and the participating agencies. All participating entities will be required to abide by the specifications, terms, conditions and pricings established in this Proposal. The quantities furnished in this proposal document are for only the Owner. It does not include quantities for any other jurisdiction. The Owner will be responsible only for the award for our jurisdiction. Other participating entities will place their own awards on their respective Purchase Orders through their purchasing office or use their purchasing card for purchase/payment as authorized or agreed upon between the provider and the individual entity. The Owner accepts no liability for payment of orders placed by other participating jurisdictions that choose to piggy-back on our solicitation. Orders placed by participating jurisdictions under the terms of this solicitation will indicate their specific delivery and invoicing instructions.

2.54. Definitions:

2.54.1. "Offeror" and/or "Proposer" refers to the person or persons legally authorized by the Consultant to make an offer and/or submit a response (fee) proposal in response to the Owner's RFP.

2.54.2. The term "Work" includes all labor, materials, equipment, and/or services necessary to produce the requirements of the Contract Documents.

2.54.3. "Contractor" is the person, organization, firm or consultant identified as such in the Agreement and is referred to throughout the Contract Documents. The term Contractor means the Contractor or his authorized representative. The Contractor shall carefully study and compare the General Contract Conditions of the Contract, Specification and Drawings, Scope of Work, Addenda and Modifications and shall at once report to the Owner any error, inconsistency or omission he may discover. Contractor shall not be liable to the Owner for any damage resulting from such errors, inconsistencies or omissions. The Contractor shall not commence work without clarifying Drawings, Specifications, or Interpretations.

2.54.4. "Sub-Contractor is a person or organization who has a direct contract with the Contractor to perform any of the work at the site. The term sub-contractor is referred to throughout the contract documents and means a sub-contractor or his authorized representative.

2.55. Public Disclosure Record: If the Proposer has knowledge of their employee(s) or sub-proposers having an immediate family relationship with an Owner employee or elected official, the proposer must provide the Purchasing Representative with the name(s) of these individuals. These individuals are required to file an acceptable "Public Disclosure Record", a statement of financial interest, before conducting business with the Owner.

2.56. Keep Jobs in Colorado Act: Contractor shall be responsible for ensuring compliance with Article 17 of Title 8, Colorado Revised Statutes requiring 80% Colorado labor to be employed on public works. Contractor shall, upon reasonable notice provided by the Owner, permit the Owner to inspect documentation of identification and residency required by C.R.S. §8-17-101(2)(a). If Contractor claims it is entitled to a waiver pursuant to C.R.S. §8-17-101(1), Contractor shall state that there is insufficient Colorado labor to perform the work such that compliance with Article 17 would create an undue burden that would substantially prevent a project from proceeding to completion, and shall include evidence demonstrating the insufficiency and undue burden in its response.

Unless expressly granted a waiver by the Owner pursuant to C.R.S. §8-17-101(1), Contractor shall be responsible for ensuring compliance with Article 17 of Title 8, Colorado Revised Statutes requiring 80% Colorado labor to be employed on public works. Contractor shall, upon reasonable notice provided by the Owner, permit the Owner to inspect documentation of identification and residency required by C.R.S. §8-17-101(2)(a).

2.56.1. "Public Works project" is defined as:

(a) any construction, alteration, repair, demolition, or improvement of any land, building, structure, facility, road, highway, bridge, or other public improvement suitable for and intended for use in the promotion of the public health, welfare, or safety and any maintenance programs for the upkeep of such projects

(b) for which appropriate or expenditure of moneys may be reasonably expected to be $500,000.00 or more in the aggregate for any fiscal year

(c) except any project that receives federal moneys.

SECTION 3.0: INSURANCE REQUIREMENTS

Insurance Requirements: The selected Contractor agrees to procure and maintain, at its own cost, policy(s) of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the Contractor pursuant to this Section. Such insurance shall be in addition to any other insurance requirements imposed by this Contract or by law. The Contractor shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this Section by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types. Contractor shall procure and maintain and, if applicable, shall cause any Subcontractor of the Contractor to procure and maintain insurance coverage listed below. Such coverage shall be procured and maintained with forms and insurers acceptable to the Owner. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage. Minimum coverage limits shall be as indicated below unless specified otherwise:

(a) Worker Compensation: Contractor shall comply with all State of Colorado Regulations concerning Workers' Compensation insurance coverage.

(b) General Liability insurance with minimum limits of:

ONE MILLION DOLLARS ($1,000,000) each occurrence and
ONE MILLION DOLLARS ($1,000,000) per job aggregate.

The policy shall be applicable to all premises and operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, products, and completed operations. The policy shall include coverage for explosion, collapse, and underground hazards. The policy shall contain a severability of interests provision.

(c) Comprehensive Automobile Liability insurance with minimum limits for bodily injury and property damage of not less than:

ONE MILLION DOLLARS ($1,000,000) each occurrence and
ONE MILLION DOLLARS ($1,000,000) aggregate

(d) Professional Liability & Errors and Omissions Insurance policy with a minimum of:

ONE MILLION DOLLARS ($1,000,000) per claim

This policy shall provide coverage to protect the contractor against liability incurred as a result of the professional services performed as a result of responding to this Solicitation.

With respect to each of Contractors owned, hired, or non-owned vehicles assigned to be used in performance of the Work. The policy shall contain a severability of interests provision. The policies required by paragraph (b) above shall be endorsed to include the Owner, and the Owner's officers and employees as additional insureds. Every policy required above shall be primary insurance, and any insurance carried by the Owner, its officers, or its employees, or carried by or provided through any insurance pool of the Owner, shall be excess and not contributory insurance to that provided by Bidder. No additional insured endorsement to any required policy shall contain any exclusion for bodily injury or property damage arising from completed operations. The Bidder shall be solely responsible for any deductible losses under any policy required above.

SECTION 4.0: SPECIFICATIONS/SCOPE OF SERVICES

4.1. General/Background: The Persigo Wastewater Treatment Plant (a.k.a. Persigo) has a rated capacity of 12.5 million gallons of wastewater per day. It is located in Grand Junction, Colorado and is jointly owned by the City of Grand Junction and Mesa County.

In 2015, Persigo commissioned a first-of-its-kind project that beneficially recaptures waste methane biogas produced as a byproduct of the anaerobic digestion process and converts it into compressed natural gas (CNG) which is used as a vehicle fuel. The CNG produced at Persigo is a carbon-neutral advanced biofuel and is used locally to fuel 69 fleet vehicles owned by the City of Grand Junction and Mesa County.

The biogas recapture system is called BioCNG; it purifies, pressurizes and stores the gas in a pipeline which conveys the fuel to the centrally located CNG vehicle fueling station. While the BioCNG project has been incredibly successful, it has been determined after operating the system for 5 years that about 21% or 25,500 gasoline gallon equivalents per year of CNG, available to be used as vehicle fuel, are still being flared to the atmosphere because there is not enough available storage volume in the current system. In addition to the storage constraints, there is a significant offset in the biogas production rates at Persigo and its demand pattern at the fleet fueling stations.

Under current operations, Persigo produces approximately 45,000 – 50,000 standard cubic feet (scf) of CNG per day that can be used in vehicles for fuel. The existing gas storage is comprised of 3 high pressure spheres at the CNG fueling station, a medium pressure 4-inch pipeline that is about 6 miles in length between Persigo and the fueling station, and raw digester gas storage under a floating anaerobic digester cover at Persigo. In total, the existing gas storage volume is about 75,000 – 80,000 scf and represents a best case scenario of 1.5 days of CNG storage. Currently, the demand for CNG by the fleet vehicles is about double the amount of CNG produced at Persigo.

This project desires to implement solutions identified for both supply side storage and demand side management. Conceptually, this project envisions constructing an additional 60,000 - 75,000 scf of low pressure gas storage in a ground mounted membrane gas holder system at Persigo and provide upgrades to the existing fueling station which includes additional gas flow metering, flow control valves, radio or cellular telemetry, a PLC, and programming and integration of the controls. Through increasing gas storage onsite at Persigo and enhancing the instrumentation and automation at the fueling stations, we aim to eliminate the flaring of CNG and maximize the beneficial use of this renewable resource. Furthermore, beneficially using all the current biogas will allow the facility to investigate options and alternatives to potentially increase gas production in the future.

Project Purpose: The purpose of this RFP is to obtain proposals from qualified and professional design-build firms/contractors specializing in the design, development, and construction of Bio Compressed Natural Gas (BioCNG) fueling facilities, to provide design services and construction of a low pressure biogas storage system at the Persigo Wastewater Treatment Plant and construction of improvements to the instrumentation and automation of a CNG fleet fueling station. Storage facility to be located at the Persigo WWTP, 2145 River Road, Grand Junction, CO. Automation and instrumentation located at City's Municipal Campus area at 333 West Avenue, Grand Junction, CO.

Budget: The total all-inclusive budget for this project is $1,080,000, excludes option maintenance costs and shall not be exceeded. Reference Section 4.2.3 "Pricing" for details.

Grant Funding: A portion of this project is funded with a Department of Local Affairs grant. Consultant and any subcontractors must satisfy all administrative requirements required by the grant funding including but not limited to:

> ***"Plans & Specifications****. Construction plans and specifications shall be drawn up by a qualified engineer or architect licensed in the State of Colorado, or pre-engineered in accordance with Colorado law, and hired by the Grantee through a competitive selection process.* "

4.2. Special Conditions/Provisions:

4.2.1 Recommended Pre-Proposal Virtual Meeting/Briefing: A pre-proposal virual meeting/briefing recommended for all prospective offerors. The purpose of this virtual meeting/briefing will be to inspect and to clarify the contents of this Request for Proposal (RFP). The virtual meeting/briefing shall take place on July 27, 2020 at 2:00pm. Nothing

stated during the Virtual Meeting/Briefing will modify the solicitation. Only information provided in an addendum can modify the solicitation.

The virtual meeting will be hosted via **Microsoft Teams** and attendees shall participate remotely. The link for the virtual meeting is below.

https://teams.microsoft.com/dl/launcher/launcher.html?url=%2f_%23%2fl%2fmeetup-join%2f19%3ameeting_YmVjMWU2ZDUtNjRlNC00Nzc2LWJjMzAtOTVhZDJkMDBhNTZk%40thread.v2%2f0%3fcontext%3d%257b%2522Tid%2522%253a%25228d207e5d-3faa-4a17-8389-db5747bc379c%2522%252c%2522Oid%2522%253a%252227bd0506-8294-424d-891e-42a0f92aae16%2522%257d%26anon%3dtrue&type=meetup-join&deeplinkId=5a2f879f-f73b-49ef-bf1c-a86686c4f899&directDl=true&msLaunch=true&enableMobilePage=true&suppressPrompt=true&promptSuccess=true

4.2.2 Licenses and Permits: Contractor is responsible for obtaining all necessary licenses and permits required for Construction, at Contractors expense. See Section 2.3

4.2.3 Freight/Shipping: All freight/shipping shall be F.O.B. Destination – Freight Pre-paid and allowed. Staging area provided at 333 West Ave, Grand Junction, CO 81501. Final location of approximately 39 5’26.072” N Lat 108 13”26.407” W Lon.

4.2.4 Price: Pricing shall be established as “cost plus a fixed fee with a guaranteed maximum price”, and shall be all inclusive to include but not be limited to: all design, labor, equipment, supplies, materials, freight (F.O.B. Destination – Freight Pre-paid and Allowed to the site), travel, meetings, conference calls, mobilization costs, fuel, set-up and take down costs, and full-time inspection costs, and all other costs related to the successful completion of the project.

The Owner shall not pay nor be liable for any other additional costs including but not limited to: taxes, shipping charges, insurance, interest, penalties, termination payments, attorney fees, liquidated damages, etc.

Contractor shall submit their pricing utilizing the attached form in Section 7.0 Solicitation Response Form.

All fees will be considered by the Owner to be negotiable.

4.2.5 Warranty: Contractor shall submit manufacturer warranty information for Owner’s approval, prior to product ordering. Additionally, Contractor shall provide a minimum 1 year Contractors warranty.

4.2.6 Laws, Codes, Rules, and Regulations: Contractor shall ensure that all services provided meet all Federal, State, County, and City laws, codes, rules, regulations, and requirements for providing such services.

4.2.7 Freight/Shipping: All freight/shipping shall be F.O.B. Destination – Freight Pre-Paid and Allowed to each of the project sites.

4.2.8 Equipment/Product/Materials Quantities: Contractor shall be responsible for determining all measurements for correctness, and all quantities/types of equipment/products/materials required for successful project completion. Also see Section 2.5 **Quantities of Work and Unit Price.**

4.2.9 Contractor Staging Area: Awarded Contractor shall coordinate with Owner for proposed project staging area during the construction phase.

4.2.10 Construction Working Schedule: Working schedule shall be Monday – Friday from 7:00am-5:00pm. If alternate scheduling is needed, Contractor shall coordinate with, and receive approval from, the City's Project Manager.

4.2.11 Time of Completion: Contractor shall submit a complete project schedule with their proposal. The City and awarded Contractor shall negotiate the final project completion date.

4.2.12 Contract: A binding contract shall consist of: (1) the RFP and any amendments thereto, (2) the proposer's response (proposal) to the RFP, (3) clarification of the proposal, if any, and (4) the City's Purchasing Department's acceptance of the proposal by "Notice of Award". All Exhibits and Attachments included in the RFP shall be incorporated into the contract by reference.

A. The contract expresses the complete agreement of the parties and, performance shall be governed solely by the specifications and requirements contained therein.

B. Any change to the contract, whether by modification and/or supplementation, must be accomplished by a formal contract amendment signed and approved by and between the duly authorized representative of the bidder and the City Purchasing Division or by a modified Purchase Order prior to the effective date of such modification. The proposer expressly and explicitly understands and agrees that no other method and/or no other document, including acts and oral communications by or from any person, shall be used or construed as an amendment or modification to the contract.

4.2.13 CITY PROJECT MANAGER: The Project Manager for the Project is Kurt Carson – Wastewater Services Manager, who can be reached at (970)256-4171. <u>During Design and Construction</u>, all notices, letters, submittals, and other communications directed to the City shall be addressed and mailed or delivered to:

City of Grand Junction
Department of Public Works -Utilities
Attn: Kurt Carson, Project Manager
2145 River Road
Grand Junction, CO 81505

4.3. Scope of Services: The general scope of services to be obtained as a result of this RFP includes all design, preconstruction, and construction services required for successful completion of the project.

The BioCNG design/build firm shall design, obtain all permits, construct, manufacture, procure equipment/material, install, train City personnel, and test the low pressure biogas storage system, and the improvements to the instrumentation and automation of a CNG fleet fueling station.

Minimum BioCNG Design/Build Firm Requirements:

• At least five years in the industry, with experience directly related to owning and operating facilities similar in size and scope.

• Successfully completed three (3) similar projects in the last five (5) years.

• Each design/build firm must show:
(a) complete disclosure of any incidents of default on projects where the Firm or related entity acted as project sponsor and the current status of such incidents;
(b) complete disclosure of any liabilities, contingent liabilities, obligations, charges and liens, covenants, off-balance sheet financing arrangements, defaults, legal action pending, or other matters that might prevent the Firm from implementing the Project; and
(c) the Firm's or related entity's latest audited financial statements available as at the date of the RFP Submission.

• Ability to meet the bonding and insurance requirements of the City of Grand Junction. Submit a Bid Bond and COI with this response.

• Architect and engineers retained to construct facility are to be licensed/registered to practice in Colorado.

• Qualified and permitted by law to perform the services provided for this project. All personnel engaged in this work for this project shall likewise be qualified and permitted to perform necessary duties.

• Ensure compliance with all applicable environmental regulations related to the project.

• The ability to develop value engineered solution options, budget and/or cost estimates, plans, drawings, designs, and to obtain and manage permitting, scheduling and any other typical building construction task.

• Project management and supervision.

• Coordination of construction, scheduling of construction meetings and resolving discrepancies or disputes with sub-contractors or other supply or services vendors.

• Preparation of all plans, schematics, drawings, scope, specifications, and all other related documents and requirements associated with the successful completion of this project..

• Providing a time frame for completion of total design development, and each construction phase as well as a schedule for total completion of the project.

• Scheduling inspections and meeting applicable National, State and local building code requirements to achieve approval of work. The selected firm will be responsible for obtaining all building permits and will be responsible for permit related fees.

• The BioCNG firm may use local, qualified partners in design, engineering, construction and maintenance of the facility.

Summary of Requirements of the selected Design/Build Firm:

➢ Designing a BioCNG vehicle fueling station and storage facility (at a minimum Design shall consist of: architectural and engineering, program management, construction management, feasibility studies (if required), preliminary engineering, design, architectural engineering, surveying, mapping or other related A&E Services;

➢ Securing all local, state and Federal permits required to construct the Station;

➢ Determining if utility upgrades are required for operation of the Station and Storage Facility, and coordinating any required utility upgrades;

➢ Constructing the Station on a site provided by Owner;

➢ Completion of all work on the Station and Storage Facility (including testing and commissioning) by the negotiated date between the awarded Contractor and Owner;

➢ Providing training to Owner employees on vehicle fueling and Station operating, safety and emergency procedure, and;

➢ Owner shall be the sole contracting entity for the equipment and be provided by the selected Contractor.

➢ Develop Performance Specification of the Design-Build

➢ Project management and coordination

➢ Data collection, review and organization

➢ Validate additional gas storage volume requirements

➢ Permitting including but not limited to: site application amendment

➢ Basis of design report

➢ Progressive design with owner review at 60% and 90%

➢ Construction administration

Attached Documents:

1. GVT methodology to maximize biogas
2. CNG time fill post
3. CNG storage
4. CNG fast fill dispenser
5. 2017 CNG slow fill expansion drawings
6. 2010 FAST FILL CNG PLANS
7. Biogas operating data - flare vs pipeline

4.4. RFP Tentative Time Schedule:

• Request for Proposal Available	July 17, 2020
• Recommended Pre-Proposal Virtual Meeting/Briefing	July 27, 2020
• Inquiry deadline, no questions after this date	August 7, 2020
• Addendum Posted	August 13, 2020
• Submittal deadline for proposals	August 26, 2020
• Owner evaluation of proposals	August 27 – September 9, 2020
• Interviews (if required)	September 16, 2020
• Final selection	September 23, 2020
• City Council Approval	October 7, 2020
• Contract execution	October 8, 2020
• Work begins	Upon Notice to Proceed
• Completion Date	TBD

4.5. Questions Regarding Scope of Services:

Duane Hoff Jr., Senior Buyer
duaneh@gjcity.org

SECTION 5.0: PREPARATION AND SUBMITTAL OF PROPOSALS

Submission: ***Each proposal shall be submitted in electronic format only, and only through the Rocky Mountain E-Purchasing website (https://www.rockymountainbidsystem.com/default.asp).*** *This site offers both "free" and "paying" registration options that allow for full access of the Owner's documents and for electronic submission of proposals. (Note: "free" registration may take up to 24 hours to process. Please Plan accordingly.)* Please view our "**Electronic Vendor Registration Guide"** at http://www.gjcity.org/business-and-economic-development/bids/ for details. (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline; **800-835-4603**). For proper comparison and evaluation, the City requests that proposals be formatted as directed. Offerors are required to indicate their interest in this Project, show their specific experience and address their capability to perform the Scope of Services in the Time Schedule as set forth herein. For proper comparison and evaluation, the Owner requires that proposals be formatted **A** to **G**.

A. Cover Letter: Cover letter shall be provided which explains the Firm's interest in the project. The letter shall contain the name/address/phone number/email of the person who will serve as the firm's principal contact person with Owner's Contract Administrator and shall identify individual(s) who will be authorized to make presentations on behalf of the firm. The statement shall bear the signature of the person having proper authority to make formal commitments on behalf of the firm. By submitting a response to this solicitation the Contractor agrees to all requirements herein.

B. Qualifications/Experience/Credentials: Proposers shall provide their qualifications for consideration as a contract provider to the City of Grand Junction and include prior experience in similar projects. In addition to Section 4.3 Scope of Services, Proposers shall also provide the following information with their proposal submittal:

RNG/CNG Fueling Station Design Experience and Capabilities

Note: Key personnel will be committed to this project in the Design/Build contract and can only be changed by approval of the City.

Provide a summary of key personnel experience information. List the most recent projects first. Include project owner and contact reference, project location, scope of project, design cost, construction cost, project duration, completion date and current fueling station performance. Additional discussion of Key Personnel experience can be provided as a narrative in the RFP.

Important experience includes BioCNG fueling stations with compression and storage, specifically for municipal trucks, and projects requiring coordination of BioCNG as the primary fuel source. Higher rating will be given to design experience in Design/Build BioCNG time-fill fueling applications with treated digester gas as the primary fuel source. The RFP response must include the following information, which will be used to rate the fueling station experience and design capabilities of the Design/Build team.

a. Discuss the design experience of key personnel that is similar or relevant to this Project. Design experience should include time-fill RNG/CNG fueling logic for refuse trucks or

similar heavy equipment fleets, instrumentation and controls work, and storage/compression equipment selection.

b. Discuss experience of the key personnel working together on past Design/Build or Design-Bid-Build projects. List previous projects and roles of the key personnel. Provide client references and resumes of key personnel.
c. Discuss goals and challenges on previous projects that the team was involved in and how goals were met and challenges were addressed by key personnel.
d. Discuss projects with a change order values over 10% of the original project cost (not including change orders) or time delays over 2 months of the original duration. Describe circumstances that led to the change orders or delays and how the issues were resolved with the owner.

WWTP Biogas Upgrades Design Experience and Capabilities

Note: Key personnel will be committed to this project in the Design/Build contract and can only be changed by approval of the City.

Provide a summary of key personnel experience. List the most recent projects first. Include project owner and contact reference, project location, scope of project, design cost, construction cost, project duration, and completion date. Additional discussion of firm experience can be provided as a narrative in the RFP. Important experience includes biogas treatment, compression, delivery, and storage specifically for vehicle fuel, and projects requiring coordination of facilities and operation of treated biogas with BioCNG fueling stations. Higher rating will be given to design experience in Design/Build at Wastewater Treatment Plants of similar size to the City's and that have direct coordination with a BioCNG project. The RFP response must include the following information, which will be used to rate the biogas facilities design capabilities of the Design/Build team.

a. Discuss the design experience of key personnel that is similar or relevant to this Project. Design experience should include modifications to an existing biogas piping system and installed biogas equipment, instrumentation and controls work, biogas storage/compression design and equipment selection, and biogas treatment equipment design and selection.
b. Discuss experience of the key personnel working together on past Design/Build or Design-Bid-Build projects. List previous projects and roles of the key personnel. Provide client references and resumes of key personnel.
c. Discuss goals and challenges on previous projects that the team was involved in and how goals were met and challenges were addressed by key personnel.
d. Discuss projects with a change order values over 10% of the original project cost (not including change orders) or time delays over 2 months of the original duration. Describe circumstances that led to the change orders or delays and how the issues were resolved with the owner.

Contractor Experience and Capabilities

Note: Key personnel will be committed to this project in the Design/Build contract and can only be changed by approval of the City.

Provide a summary of key personnel experience. List at least three projects (within the last three years) for each project type listed below. If less than three completed projects, Contractor can still be used for the Design/Build team but will receive fewer points in the evaluation. List the most recent projects first. Additional discussion of contractor experience can be provided as a narrative in the RFP.

Important construction experience includes installation of biogas treatment, compression, delivery, and storage systems specifically for vehicle fuel, and projects requiring coordination of treated biogas with BioCNG suppliers and integration of BioCNG with biogas fueling stations. Higher rating will be given to construction experience in Design/Build at Wastewater Treatment Plantss of similar size to the City's and that have direct coordination with a BioCNG project. The RFP response must include the following information, which will be used to rate the construction and construction management capabilities of the Design/Build team.

a. List recent construction projects completed at a wastewater treatment plant that included site utilities, structural, mechanical, electrical, and instrumentation and controls work.
b. List recent construction projects completed at a wastewater treatment plant that included modifications to digester gas piping system and installed digester gas equipment.
c. List recent construction projects that included the installation of piping and equipment for a compressed natural gas system at a minimum operating pressure of 4,000 psig. If Contractor does not have this experience, list the proposed subcontractor and provide the subcontractor information.
d. Discuss projects listed with a change order values over 10% of the original project cost (not including change orders) or time delays over 2 months of the original duration.
e. Describe circumstances that led to the change orders or delays and how the issues were resolved with the owner.
f. Provide the contractor's safety information, including a summary of the safety program or plan and the Experience Modification Rate for the most recent year available.
g. For information only. Provide information on major subcontractors (e.g. structural concrete, electrical, process mechanical) proposed for this project. Indicate if the subcontractor worked on a previous Design/Build or a Design-Bid-Build project. If subcontractors have not been determined, list subcontractors you have previously worked with and the project they worked on.

<u>Start-Up, Commissioning, and Performance Verification</u>

The RFP response must include the following information, which will be used to rate the support that the Design/Build team provides for startup and commissioning of the project.

a. Describe the general approach and process that will be used in start-up, commissioning and performance verification for this project. Identify the personnel that will perform start-up and list previous experience.
b. Discuss the experience of the Design/Build in start-up, commissioning and performance verification.
c. Describe the types of operation and maintenance documents prepared on previous projects and recommended O&M documents for this project.

C. **Strategy and Implementation Plan:** Describe your (the firm's) interpretation of the Owner's objectives with regard to this RFP. Describe the proposed strategy and/or plan for achieving the objectives of this RFP. The Firm may utilize a written narrative or any other printed technique to demonstrate their ability to satisfy the Scope of Services. The narrative should describe a logical progression of tasks and efforts starting with the initial steps or tasks to be accomplished and continuing until all proposed tasks are fully described and the RFP objectives are accomplished. Include a **time schedule** for completion of your firm's implementation plan and an estimate of time commitments from Owner staff.

D. **References:** Provide references per Section 4.3 Scope of Services, Minimum BioCNG Design/Build Firm Requirements with name, address, telephone number, and email address that can attest to your experience in projects of similar scope and size.

E. **Bid Bond and Certificate of Insurance:** Proposer shall submit a Bid Bond and Certificate of Insurance, as per the solicitation documents.

F. **Fee Proposal:** Provide your fee proposal, as stated in Section 4.2.4 Pricing, using the Solicitation Response Form found in Section 7.

G. **Additional Data (optional):** Provide any additional information that will aid in evaluation of your qualifications with respect to this project.

H. **Financial Statements:** Proposer shall provide an audited financial statement, as prepared by a certified public accountant, for their prior fiscal year, consisting of a balance sheet, profit and loss statement and such other financial statements as may be appropriate, which shall demonstrate that the proposer possesses adequate financial ability and stability to enable the Proposer to fulfill their obligations under the terms of this RFP. If requested by the Proposer, such information shall be treated as confidential by the Owner and shall not be subject to public disclosure. These documents must depict the financial status of that entity, subsidiary, division, or subdivision thereof, which will actually provide services. If the Proposer is a partnership or joint venture, individual financial statements must be submitted for each general partner or joint venture thereof. Consolidated balance sheets and profit/loss statements depicting the financial status of a Parent Corporation or joint venture shall not be considered an acceptable response.

SECTION 6.0: EVALUATION CRITERIA AND FACTORS

6.1 Evaluation: An evaluation team shall review all responses and select the proposal or proposals that best demonstrate the capability in all aspects to perform the scope of services and possess the integrity and reliability that will ensure good faith performance.

6.2 Intent: Only respondents who meet the qualification criteria will be considered. Therefore, it is imperative that the submitted proposal clearly indicate the firm's ability to provide the services described herein.

Submittal evaluations will be done in accordance with the criteria and procedure defined herein. The Owner reserves the right to reject any and all portions of proposals and take into consideration past performance. The following parameters will be used to evaluate the submittals (**with weighted values**):

- Responsiveness of Submittal to the RFP **(1)**
  (Firm has submitted a proposal that is fully comprehensive, inclusive, and conforms in all respects to the Request for Proposals (RFP) and all of its requirements, including all forms and substance.)
- Understanding of the Project and Objectives **(6)**
  (Firm's ability to demonstrate a thorough understanding of the City's goals pertaining to this specific project.)
- Experience **(5)**
  (Firm's proven proficiency in the successful completion of similar projects.)
- Necessary Resources/Capability **(3)**
  (Firm has provided sufficient information proving their available means to perform the required scope of work/service; to include appropriate bonding, insurance an all other requirements necessary to complete the project.)
- Strategy & Implementation Plan **(4)**
  (Firm has provided a clear interpretation of the City's objectives in regard to the project, and a fully comprehensive plan to achieve successful completion. See Section 5.0 Item C. – Strategy and Implementation Plan for details.)
- Fees **(2)**
  (All fees associated with the project are provided complete, comprehensive, and reasonable.)

Owner also reserves the right to take into consideration past performance of previous awards/contracts with the Owner of any vendor, contractor, supplier, or service provider in determining final award(s).

The Owner will undertake negotiations with the top rated firm and will not negotiate with lower rated firms unless negotiations with higher rated firms have been unsuccessful and terminated.

6.3 Oral Interviews: The Owner may invite the most qualified rated proposers to participate in oral interviews.

6.4 Award: Firms shall be ranked or disqualified based on the criteria listed in Section 6.2. The Owner reserves the right to consider all of the information submitted and/or oral presentations, if required, in selecting the project Contractor.

SECTION 7.0: SOLICITATION RESPONSE FORM

RFP-4813-20-DH

"Design/Build Grand Junction Bio Compressed Natural Gas (BioCNG) Storage and Fueling Station Optimization Project"

*Offeror must submit entire Form completed, dated and signed***.**

1) <u>Cost plus a Fixed Fee with a Guaranteed Maximum Price</u>:

<u>Fixed Fee</u> $_____

WRITTEN:_____**dollars.**

<u>Guaranteed Maximum Price</u> $_____

WRITTEN:_____**dollars.**

The Owner reserves the right to accept any portion of the work to be performed at its discretion

---

The undersigned has thoroughly examined the entire Request for Proposals and therefore submits the proposal and schedule of fees and services attached hereto. This offer is firm and irrevocable for sixty (60) days after the time and date set for receipt of proposals.

The undersigned Offeror agrees to provide services and products in accordance with the terms and conditions contained in this Request for Proposal and as described in the Offeror's proposal attached hereto; as accepted by the Owner.

Prices in the proposal have not knowingly been disclosed with another provider and will not be prior to award.

- Prices in this proposal have been arrived at independently, without consultation, communication or agreement for the purpose of restricting competition.
- No attempt has been made nor will be to induce any other person or firm to submit a proposal for the purpose of restricting competition.
- The individual signing this proposal certifies they are a legal agent of the offeror, authorized to represent the offeror and is legally responsible for the offer with regard to supporting documentation and prices provided.
- Direct purchases by the City of Grand Junction are tax exempt from Colorado Sales or Use Tax. Tax exempt No. 98-903544. The undersigned certifies that no Federal, State, County or Municipal tax will be added to the above quoted prices.
- City of Grand Junction payment terms shall be Net 30 days.
- Prompt payment discount of _____ percent of the net dollar will be offered to the Owner if the invoice is paid within _____ days after the receipt of the invoice.

RECEIPT OF ADDENDA: the undersigned Contractor acknowledges receipt of Addenda to the Solicitation, Specifications, and other Contract Documents. State number of Addenda received: _____.

It is the responsibility of the Proposer to ensure all Addenda have been received and acknowledged.

_____	_____
Company Name – (Typed or Printed)	Authorized Agent – (Typed or Printed)
_____	_____
Authorized Agent Signature	Phone Number
_____	_____
Address of Offeror	E-mail Address of Agent
_____	_____
City, State, and Zip Code	Date

4675 MacArthur Court, Suite 800
Newport Beach, California 92660 USA
949/437-9017 fax 949/724-1343

www.cleanenergyfuels.com

Construction of Grand Valley Transit CNG Fueling Facility

Methodology to Maximize Biogas Usage
For reference: The city of Grand Junction has a biogas system that supplements the utility gas supply for the CNG fueling facilities. Biogas is continuously accumulating in storage that rises in pressure from 20-95 psig., total storage volume is around 11,500 scf (5.7 miles of 4" poly pipe).

Biogas mode explanation:
On the weekend (Saturday afternoon until Sunday night) the bio gas usage will be maximized by only operating the compressor to feed time-fill fueling locations when biogas is available.
At the beginning of this time period, the vehicles parked at the time-fill fueling locations need to be empty or partially empty in order to accept the biogas as it becomes available.
If there is demand from the fast fill dispenser the compressor will still operate as normal and use utility gas along with any available biogas.

Time-fill fueling will be controlled by a pressure transducer on the biogas supply line. The compressor will be turned on to feed time-fill fueling locations when the biogas rises above 85 psi and run until the pressure is pulled down to 22psi. (These 2 pressure variables will be set points that can be adjusted in the field.)

The system will only run in this delayed time-fill mode from Saturday afternoon until Sunday night (Saturday 10am until Sunday 6pm). On Sunday night, the system will change from the delayed time-fill mode to the regular filling mode. This will result in the compressor operating until the time-fill line pressure target is reached. The compressor will again draw utility gas along with any available biogas. Changing back to the regular mode on Sunday night will ensure the vehicles are filled and ready for Monday morning.
(The time frame when the bio gas mode is turned on and off will be a variable that can be set in the field.)

Regular Mode Summary:
Time-Fill: The compressor will feed CNG to the time-fill until line pressure reaches pressure target. Compressor will turn on whenever the time fill line pressure falls below a set threshold pressure.
Fast-Fill: The compressor and/or storage vessels will feed CNG to the dispenser line whenever pressure falls below the set threshold, the compressor will operate until the pressure target is reached.

Biogas Mode Summary:
Time Fill: The compressor will only operate when biogas pressure rises above 85psi and continue to operate until the biogas line pressure falls below 22psi.
Fast-Fill: The compressor and/or storage vessels will feed CNG to the dispenser line whenever pressure falls below the set threshold, the compressor will operate until the pressure target is reached.

TimefillCNG

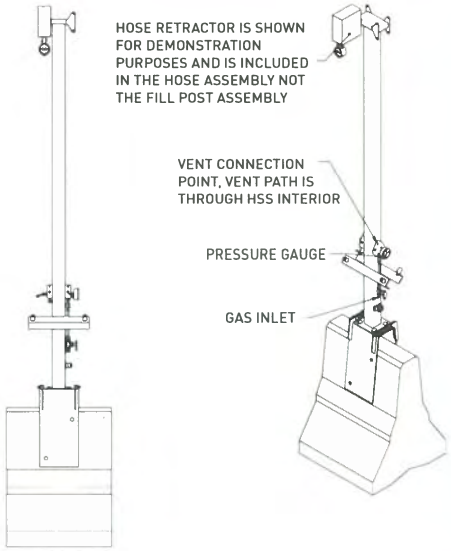
by Clean Energy®

Overnight Fleet Fueling Made Easy

Safe, Affordable, Easy-to-Install

Clean Energy®'s fill posts are engineered to the highest standards to deliver consistent CNG fueling performance for your fleet. Our dispensing systems have earned a reputation worldwide for proven fast-fill and time-fill performance in public station, fleet operations, and bulk CNG transportation.

Compact size and modular design makes this time fill post easy to install and affordable. High-quality pressure fitting components are used throughout, and are skillfully assembled to perform reliably and accurately under the toughest CNG fueling conditions. TimefillCNG posts are pressure-tested in factory, K-rail mounting avoids vehicle impacts, and special valve connections ensure safe connection and disconnection.



Technical

MEDIUM	SWEET, DRY NATURAL GAS
MAXIMUM ALLOWABLE HEAVY HYDROCARBON	-40°C (-40°F)
MAXIMUM DESIGN PIPING PRESSURE (MAWP)	5 PPM
RECOMMENDED GAS DRYNESS	<4 LBS H2O/MMSCF
DESIGN AMBIENT TEMPERATURE	-29 TO 65°C (-20 TO 150°F), -40 TO 65°C (-40° TO 150°F)
	310 BAR (4500 PSIG)
MINIMUM GAS INLET TEMPERATURE	-29°C (-20°F)
FILLING PRESSURE	250 BAR (3625 PSIG) TEMPERATURE COMPENSATED TO 15°C
DESIGN FLOW RATE	SCFM 250
	NM^3/H 400
GAS INLET CONNECTIONS	3/8" COMPRESSION FITTING
GAS OUTLET CONNECTIONS	NGV 1 TYPE 2 FUELING NOZZLE
HOSE OPTIONS	1, 2, 3 OR 4 PARALLEL FILL HOSES
DIMENSIONS	14" W X 87"H (360 MM W X 2200MM H)
APPROXIMATE WEIGHT	61 LBS (28 KG) (WITHOUT HOSES)
CODE COMPLIANCE	NFPA 52/70, ASME B 31.3, CE
ELECTRICAL BONDING	GROUND MOUNTING INCLUDED
OPTIONS	COLD WEATHER PACKAGE (BELOW -20°F AMBIENT) CAISSON MOUNTING, OR K -RAIL MOUNTING

Features

Compact, Modular Design

Quick 4 Bolt K-Rail Installation

Up to 4 Hoses; Lengths up to 33'

Interchangeable with CompleteCNG Hose Modules

K-Rail "Or Caisson" Installation

Seamless Integration with Most Mounting Systems

Code Compliant (ASME, CSA, CE, ISO, NFPA, NEC)

John Polovina
Business Development Manager
562.370.4746
john.polovina@cleanenergyfuels.com

Clean Energy®

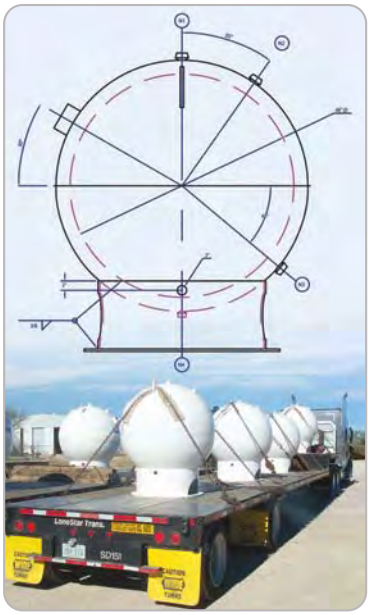
4675 MacArthur Court, Suite 800
Newport Beach, CA 92660
Tel 949.437.1000 • Fax 949.724.1397
www.CleanEnergyFuels.com

ALTERNATIVE FUELS

ALLIED EQUIPMENT, INC.

COMPRESSED NATURAL GAS STORAGE SPHERE

- 48” Inside Diameter
- 5,500 to 10,000 PSI Design Pressure
- Fabricated to ASME Code Section VIII, Division 1 or 2
- 33.5 Cubic Ft. Water Volume
- 250 Gallon Capacity
- 1” Relief Valve with Isolation and Bleed Block Included
- 1/2” Drain Valve Included
- Outer Dimensions 63”(H) x 56”(W)
- Weight 8,735 lbs.
- White Epoxy Paint
- Stackable Options Available

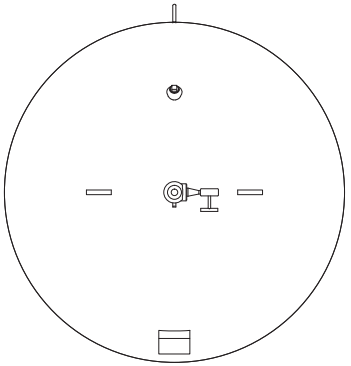


48” ID SPHERE

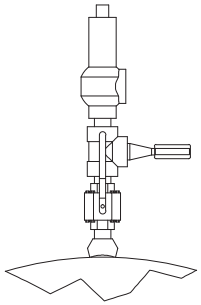
Storage Pressure	Cubic Ft. Per Sphere	Gasoline Gallons per Sphere	*Diesel Gallons per Sphere
5,000#	12,314	103	91
4,500#	11,650	97	86
4,000#	11,045	92	82
3,600#	10,564	88	78

135 cu. ft. of natural gas is equal to one (1) gallon of diesel fuel.

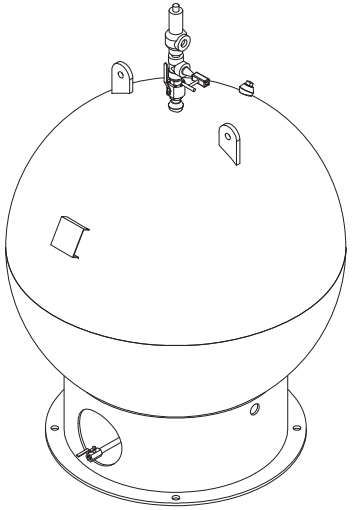
P.O. Box 14188 • Odessa, TX 79768 • Phone 432.367.6000 • Fax 432.367.3939 • www.alliedeq.com

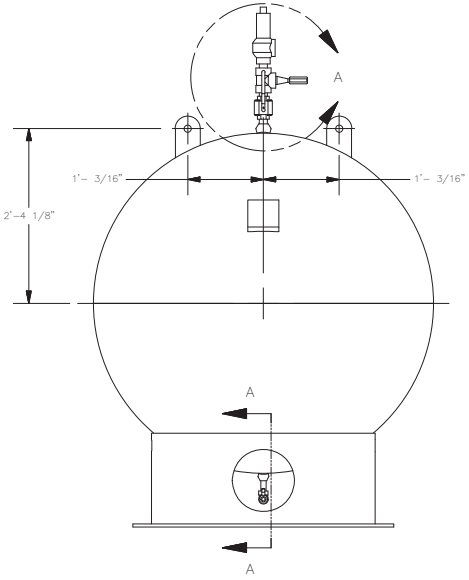


TOP VIEW

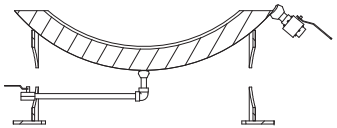


DETAIL A

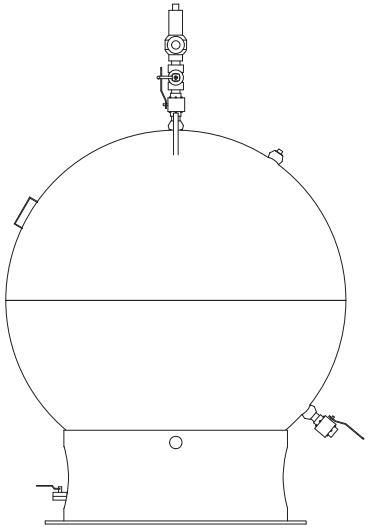




FRONT VIEW



SECTION A–A



RIGHT VIEW

REFERENCE DRAWINGS		REVISIONS					
NUMBER	DESCRIPTION	NO.		DATE	BY	CHK	APV
		B	MOVED LIFITING LUGS.	6/19/12	JEO		

ALLIED
EQUIPMENT, INC.
P.O. BOX 14188 – ODESSA, TEXAS 79768

DESCRIPTION
48" I.D. SPHERE DETAIL

CUSTOMER

SCALE | W.O. NO.

DRAWN JEO | 9/16/2011 | CUSTOMER W.O.

CHECK

APVD

DWG. NO. 110602 | REV B

Kraus Quotation # K2764 R00

Customer Name:	Clean Energy Fuels
Contact Name:	David Ulrich
Project Name:	Grand Junction, CO
Created By:	Dev Patel
Quotation Date:	August 23rd, 2016
Quotation Expiry:	September 23rd, 2016

1.0 Introduction

Kraus Global is a leading provider of alternative fuels dispensers for the global transportation market. Kraus has engineered and developed innovations, such as easy-to-use, LPG, CNG, LNG and Hydrogen dispensing systems, electronic registers, and automatic temperature compensation systems that have helped shape the industry.

Kraus is focused on the design and manufacturing of world-class dispensers, components and electronics for alternative fuels. Because of our history of designing and packaging reciprocating compressors, priority sequencing panels and the development of complete CNG stations, Kraus Global's dispenser designs are based on a thorough understanding of a CNG station.

More than 5000 Kraus dispensers are now installed in over 30 countries around the world. This global experience allows Kraus to be familiar with the varied customer requirements in each market.

To support this rapidly growing global market, Kraus has 44,000 square feet of dedicated production space and test facilities capable of full load testing of all dispensing equipment on natural gas or LPG at operating conditions. This ISO 9001:2008 registered facility is capable of producing 2000+ dispensers per year.

Collaborating with a worldwide network of proven component suppliers Kraus dispensers are recognized for their quality and performance. These suppliers are experts in their own field and bring new technology and advancements to their CNG components that are greater than any one company with limited resources can sustain. Kraus is able to leverage the production capacity of this global supply chain to spread the workload, minimize delivery times and add flexibility when demand suddenly increases due to tender awards or significant market growth. Should the need arise; our key component suppliers have a worldwide sales and service network which is available for field support. Finally, Kraus is able to leverage foreign currency advantages within the market by sourcing a smaller or larger percentage of supply through various countries to ensure competitive pricing.

Kraus Global offers the benefit of our experience and knowledge in the following quotation for equipment. It has been custom designed to suit your application, and was prepared with the skill and precision of our dedicated staff members. This quotation outlines the scope of work to be provided by Kraus Global for the proposed project and associated technical specifications.

2.0 Scope of Supply

In response to your request, Kraus Global Ltd. is pleased to present the following equipment quotation to suit your application:

KRAUS MODEL NUMBER	DESCRIPTION	QUANTITY OFFERED
SAM 1CHG-P62CG11SXX01 *Single Hose, Standard Duty, Fleet Series Dispenser*	2000 SCFM, single hose, single buffer line, CNG dispenser housed in a Kraus Fleet Series cabinet. This dispenser includes a standard holster, 3600 psi filling pressure, and one OPW CT1000 nozzle. The KAF402 series solenoid valves will be utilized for fill control.	1

All Kraus equipment fully complies with the following specifications:

CNG Codes	NFPA 52 Compressed Natural Gas Vehicular Fuel Systems Code
Electrical Code	NFPA 70 National Electric Code
Piping Code	ASME B31.3 – Piping Code
Weights & Measures	NCWM - NTEP W&M Approval

A note on posted Kraus Global dispenser flow rates:

Kraus Global's stated flow rates reflect the rate at which the internal piping system of the dispenser is capable of flowing compressed natural gas into the inlet of the nozzle at maximum pressure differential assuming full flow is available at the dispenser inlet. The actual flow rate into the vehicle system may be limited by the nozzle selection and the internal vehicle piping configuration.

3.0 Technical Specifications

3.1 CNG Dispenser

Model: SAM 1CHG-P62CG11SXX01

Description: Single hose, single buffer line, CNG dispenser in a Kraus Fleet Series cabinet. The dispenser is designed for a 2000 SCFM flow rate. Control via KAF 402 series solenoid valves.

Dispenser Control	Control via Micon 500C computerized register unit (with ability for internal or remote flow-rate based sequencing)
Number of Inlet Lines	One per hose
Flow Meters	Micro Motion CNG050
Flow Capacity Rating	**Hose 1:** 2000 SCFM **Hose 2:** n/a
Flow/Sequencing Control	**Hose 1:** Kraus KAF 402 pilot solenoid valve **Hose 2:** n/a
Dispenser Filters	One filter per inlet line, installed in dispenser
Temperature Compensation	Kraus PFS 3600 electronic temperature compensation, set to: **Hose 1:** 3 600 psig @ 70 °F **Hose 2:** n/a
Dispensing System Accuracy	± 1%
Pressure Rating	5 000 psig MAWP
Required Electrical Supply	120 VAC, 60 Hz
Electrical Rating	Class I, Division I, Group D hazardous locations
Cabinet	Kraus Fleet Series cabinet with SS columns and powder coated doors.
Breakaway	**Hose 1: Main Line** – Staubli BRW08 & **Vent Line** – Staubli BRW02 **Hose 2:** n/a
Hose	**Hose 1**: Parker ½" main line – ¼" vent line, 12 ft OAL, electrically conductive **Hose 2**: n/a
Nozzles	**Hose 1:** OPW CT1000 nozzle **Hose 2:** n/a
Venting	Captive venting for return to dispenser located at top or bottom of dispenser
Tubing	**Hose 1**: All process tubing ½" SS w/ double ferrule compression fittings **Hose 2**: n/a
Fill Pressure	**Hose 1:** 3600 psig compensated fill **Hose 2:** n/a
Pressure Relief Valves	ASME certified valves to be provided; one per hose
Holster Location	One on front side of dispenser
Approvals/Compliance	UL/CSA (components only), NFPA 52, NFPA70, ASME B31.3, NTEP W&M
Inclusions	• One external manual shutoff valve to be installed per hose • Modbus Communications • Inlet Ball Valve
Options Priced Separately	• Micon Info Pac Programmer
Exclusions	• ESD button not installed on dispenser

Kraus Fleet Series CNG Dispenser

The **Kraus Fleet Series** dispenser sets the industry standard for reliability, durability, and safety. Kraus continues to raise the bar by providing customers a lower cost alternative while delivering the continued performance expected from a dispenser built by Kraus. Featuring the industry leading **MICON™ 500 CNG** controller at the heart of its system, the **Kraus Fleet Series** dispenser is ideal for both commercial and retail CNG fueling applications.

Flexibility - The Fleet Series dispenser is designed to be used in fleet, private, and retail locations all while providing a full range of flow rate designs and inlet configurations. This provides scalability to use the **Fleet Series** dispenser in light duty applications right through to full flow trucking & transit applications. Our ability to customize solutions to suit our customers' unique and changing needs is a recognized strength of ours within the industry.

Connectivity -The Fleet Series dispenser provides simplified connections to all industry accepted external FMS/POS systems via a range of communications protocols. The optional Modbus communications package provides detailed real-time fill information to the station side electronics, allowing for enhanced monitoring and analysis of each transaction.

Hazardous Locations - The Fleet Series dispenser utilizes a full Class 1, Division 1, Group D design via flameproof and intrinsically safe protections methods.

Control - Featuring the industry leading MICON™ 500 CNG controller, the **Kraus Fleet Series** dispenser includes configurable set points providing you with greater control to optimize the dispenser to suit your specific filling needs.

Safety - The MICON™ 500 CNG controller features full temperature compensated fills for both hot and cold weather, adapting to its installation conditions while accounting for heat of compression during the fill process.

Reliability - Kraus prides itself on creating solutions to adapt to your station goals. We have the experience and know how to evaluate the entire station design, point out challenges, and create dispensing solutions to help you maximize your station output and efficiency.

KRAUS global | dispensing solutions

Fleet Series CNG Dispenser

SPECIFICATIONS

CNGF01.ART.R00

STANDARD FEATURES:
Single and Dual hose configurations with Dual Front option available
Filling Protocol: Temperature compensated to 70°F (21°C); smart filling to compensate for Heat of Compression
Target Filling Pressure: 3,600 psi standard (3,000 psi, split pressure and other options available)
Maximum Allowable Working Pressure: All system components rated for a minimum 5,000 psi MAWP
Maximum recommended inlet pressure: 4,300 psi
Flow Rates: 1,000 SCFM, 2,000 SCFM, 3,500 SCFM, 4,500 SCFM, and Split Flow options available
Inlet Lines: Options for 1 per dispenser (buffer filling), 1 per hose, 2-bank sequencing, 3-bank sequencing; custom inlet options also available
Metering: Coriolis Mass Flow Technology; Accuracy of +/- 1%
Primary Display: Three line display of Total Sale, Total Volume/Mass, and Price per Unit located on a large, backlit LCD display for easy viewing
Coalescing Filters provided, one per inlet line; installed in dispenser or provided loose for remote monitoring depending on configuration
Start/Stop lever handle located on nozzle holster
Rated hose assemblies, electrically conductive, with in-line breakaways
Class I, Div. I Group D design via explosion proof and Intrinsically Safe protection methods

COMPUTING AND CONTROLS:
MICON TM 500C Controller with ability for internal or remote flow-rate based sequencing
Communication Interfaces: 2-wire or pulse connection to external FMS
Compatibility with industry leading POS/FMS/PLC devices via multiple communication interfaces
Available Modbus Communications package for connection to station PLC
NTEP and Measurement Canada certified register
MECHANICAL CONTROLS AND VALVES:
Internal Piping & Connections available in sizes ranging from 1/4" up to 1"
Tubing and Fittings: All process tubing in SS with double ferrule compression fittings
Control Valves: High flow Electronic Solenoid Valves or Full Port Actuated Ball Valves
Pressure Gauges: One panel mounted liquid filled pressure gauge installed per hose
High Pressure Check Valves installed between sequencing valves
One ASME rated Pressure Relief Valve installed per hose
PRV set to: 4,500 psi for 3,600 psi target fills/3,750 psi for 3,000 psi target fills
1" vent line, piped to top or bottom of dispenser with easy bulkhead connection

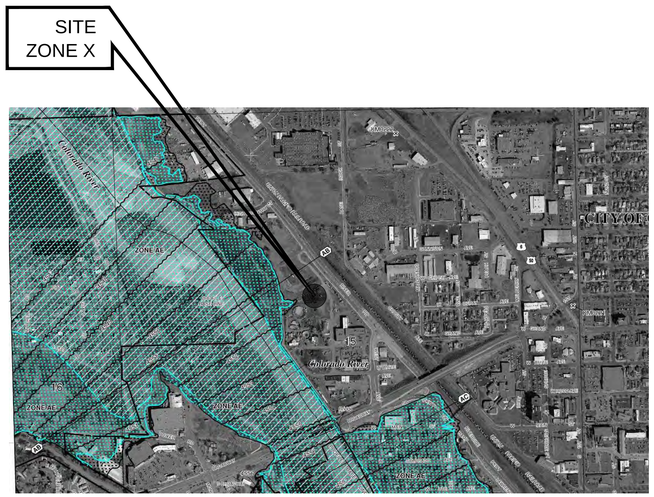
AVAILABLE OPTIONS:
NGV1 & NGV2 nozzle options
REGULATORY:
NTEP Certificate of Conformance
MC (Measurement Canada)
NRTL Certification Pending
Built to: NFPA 70, ASME B31.3, NFPA52
VOLTAGE:
120 VAC standard, 220/240 VAC available
Amperage: 5 to 10 Amps depending on options
Single Phase
60 Hz, 50 Hz available
+/- 10% Tolerence
DIMENSIONS:
Height: 84"
Width: 36"
Depth: 22"
Weight: 750 pounds, 340 Kilos
OPERATING ENVIRONMENT:
Ambient Temperature: -40°C to +50°C
Ambient Humidity: 10% to 95%, relative basis
Inlet Gas Temperature: -25°C to +75°C
Water Dew Point CNG: -32°C @ 250 Bar, maximum

25 Paquin Rd, Winnipeg, Manitoba,
CANADA, R2J 3V9 - 204.663.3601

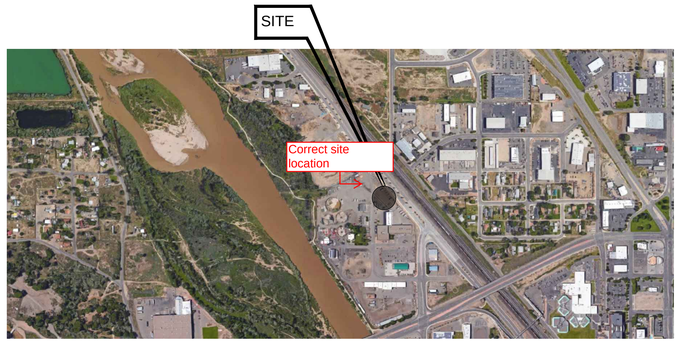
www.krausglobal.com

GRAND VALLEY TRANSIT
CNG FUELING FACILITY
333 WEST AVENUE,
GRAND JUNCTION, CO 81501

ZONE X AREAS DETERMINED
TO BE OUTSIDE 0.2% ANNUAL CHANCE FLOODPLAIN



FEMA FIRM MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

PROPERTY INFORMATION

OWNER ADDRESS:	PO BOX 20000, GRAND JUNCTION, CO 81502
SITE ADDRESS:	333 WEST AVENUE, GRAND JUNCTION, CO 81501
APN:	2945-152-00-941
ZONE:	I-1
OCCUPANCY:	M

PROJECT DESCRIPTION

PROJECT SCOPE IS TO INSTALL A CNG FUELING FACILITY AT THE EXISTING PROPERTY AT **333 WEST AVENUE, GRAND JUNCTION, CO 81501**

EQUIPMENT AT THE NATURAL GAS FACILITY INCLUDES: (1) 200 HP COMPRESSOR, (3) STORAGE SPHERES, (1) GAS DRYER, (1) CNG DISPENSER, ESD POSTS, BUFFER VALVE PANEL AND (10) TIME FILL POSTS WITH ASSOCIATED CONTROLS EQUIPMENT PADS, INTERCONNECTING PIPING, AND ELECTRICAL AND SAFETY SYSTEMS.

DRAWING INDEX

GENERAL NOTES

NOTE: THE TERM "CONTRACTOR" OR "CONTRACTORS" AS USED IN THESE GENERAL NOTES SHALL REFER TO THE PRIME CONTRACTOR AND ALL SUB-CONTRACTORS.

1. THIS SET OF CONSTRUCTION DOCUMENTS COVERS THE CNG SYSTEM IMPROVEMENTS ONLY AND MAY NOT SHOW ALL EXISTING SITE IMPROVEMENTS FOR THE FACILITY.
2. THE CONTRACTORS SHALL PRESERVE AND MAINTAIN ACCESS TO EXISTING EXITS AND MAKE EVERY EFFORT TO MINIMIZE DISRUPTIONS TO EXISTING OPERATIONS AT ALL TIMES DURING CONSTRUCTION.
3. THE CONTRACTORS SHALL BE RESPONSIBLE FOR VERIFYING THAT ALL MATERIALS, LABOR, INSTALLATION, FABRICATION, ETC. SHALL CONFORM TO ALL CODES AND REGULATIONS OF APPLICABLE GOVERNING AGENCIES.
4. THE CONTRACTOR SHALL VERIFY DIMENSIONS AND SITE CONDITIONS PRIOR TO COMMENCING ANY WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCY CONTAINED WITHIN THESE CONSTRUCTION DOCUMENTS WHICH ARE RELATED TO THE CONTRACTOR'S SCOPE OF WORK. SHOULD AN ERROR APPEAR IN THESE CONSTRUCTION DOCUMENTS OR RELATED WORK PERFORMED BY OTHER CONTRACTORS AFFECTING THE CONTRACTOR'S SCOPE OF WORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT ONCE FOR INSTRUCTIONS AS TO THE PROCEDURE FOR CONTINUATION OF WORK. SHOULD THE CONTRACTOR PROCEED WITH WORK AFTER IDENTIFYING SUCH A CONFLICT WITHOUT OBTAINING INSTRUCTIONS FROM THE ENGINEER, THE CONTRACTOR SHALL ASSUME THE FULL RESPONSIBILITY FOR ALL REMEDIAL WORK NECESSARY TO SATISFY THE REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS AND THE APPLICABLE BUILDING CODES.
5. THE CONTRACTOR SHALL REFER TO THE BID DRAWINGS AND WRITTEN TECHNICAL SPECIFICATIONS - IF ANY - FOR ADDITIONAL INFORMATION AND REQUIREMENTS WHICH ARE HEREBY INCORPORATED INTO THE PROJECT REQUIREMENTS BY REFERENCE.
6. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS WITH THOSE SHOWN ON THE DRAWINGS AND PROMPTLY REPORT ANY DISCREPANCIES TO THE ENGINEER. VERIFY EXISTING CONDITIONS WITHIN THE WORK AREA AND REVIEW MODIFICATIONS REQUIRED TO SUIT EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW WORK OR MODIFICATIONS TO EXISTING CONDITIONS.
7. THE CONTRACTOR SHALL MAINTAIN THE JOB SITE IN A CLEAN, ORDERLY CONDITION, FREE OF DEBRIS AND LITTER. EACH CONTRACTOR SHALL, IMMEDIATELY UPON COMPLETION OF EACH PHASE OF HIS WORK, REMOVE ALL TRASH AND DEBRIS THAT RESULTS FROM THE PERFORMANCE OF HIS WORK.
8. CONSTRUCTION MATERIALS STORED ON THE SITE SHALL BE PROPERLY STACKED AND PROTECTED TO PREVENT DAMAGE AND DETERIORATION UNTIL USED. FAILURE TO PROTECT MATERIALS MAY BE CAUSE FOR REJECTION OF WORK.
9. THE CONTRACTOR SHALL PROTECT NEW AND EXISTING FINISHES AND CONSTRUCTION FROM DAMAGE THAT MAY OCCUR DURING CONSTRUCTION. DAMAGE TO NEW AND/OR EXISTING FINISHES AND CONSTRUCTION SHALL BE REPAIRED OR REPLACED (THE OWNER'S DECISION) WITH IDENTICAL MATERIAL AT THE CONTRACTOR'S EXPENSE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE OWNER WITH ACCURATE "AS-BUILT" RECORD DRAWINGS AT THE COMPLETION OF CONSTRUCTION. RECORD DRAWINGS WILL BE MADE BY "RED-LINING" FORMAL CONSTRUCTION DRAWINGS TO IDENTIFY ANY AND ALL CHANGES WHICH MAY HAVE BEEN MADE IN THE FIELD.
11. ALL WORK SHOWN ON THESE DRAWINGS SHALL BE CONSTRUED AS BEING NEW WORK AND PART OF THIS CONTRACT UNLESS NOTED BEING EXISTING OR OTHERWISE.
12. CONTRACTOR SHALL COMPLY WITH ALL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) AND LOCAL JURISDICTION STORM WATER POLLUTION PREVENTION (SWPP) RULES AND REGULATIONS PRIOR TO THE COMMENCEMENT OF ANY WORK AND DURING ANY CONSTRUCTION ACTIVITIES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, MATERIALS & QUANTITIES AS PART OF THE CIVIL, STRUCTURAL, MECHANICAL, P&ID AND ELECTRICAL PLANS. NO EXCEPTIONS.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE SET OF CONSTRUCTION PLANS TO ALL SUB-CONTRACTORS DISCIPLINES FOR REFERENCE AND USE.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING ALL DAMAGED OR DISTURBED TEMPORARY AND PERMANENT BENCH MARKS AT THEIR OWN EXPENSE.

ABBREVIATIONS

AC	ASPHALT CONCRETE	MAX	MAXIMUM
AFG	ABOVE FINISHED GRADE	MCC	MOTOR CONTROL CABINET
AHJ	AUTHORITY HAVING JURISDICTION	MCP	MASTER CONTROL PANEL
		MIN	MINIMUM
BCW	BARE COPPER WIRE	MSA	METER SET ASSEMBLY (GAS UTILITY)
BLDG	BUILDING	MSB	MASTER SWITCH BOARD
CL	CENTER LINE	MTR	MOTOR
CNG	COMPRESSED NATURAL GAS	(N)	NEW
COMP	COMPRESSOR	N/A	NOT APPLICABLE
CONC	CONCRETE	NGV	NATURAL GAS VEHICLE
CMU	CONCRETE MASONRY UNIT	NTS	NOT TO SCALE
CONT	CONTINUOUS	NO	NUMBER
CU FT	CUBIC FEET	OC	ON CENTER
CS	CARBON STEEL	PL	PLATE
DIA OR Ø	DIAMETER	POC	POINT OF CONNECTION
DEPT	DEPARTMENT	PB	PUSH BUTTON
DWG	DRAWING	REF	REFERENCE
(E)	EXISTING	REINF	REINFORCEMENT
EA	EACH	(RR)	REMOVE AND REPLACE
ELEV OR EL	ELEVATION	SCH	SCHEDULE
EQ	EQUAL	SEC	SECTION
ENCL	ENCLOSURE	SIM	SIMILAR
ESD	EMERGENCY SHUT DOWN	SPR	SPRINKLERED
EXIST	EXISTING	SQ	SQUARE
FG	FINISH GRADE	SF	SQUARE FEET
FH	FIRE HYDRANT	SS	STAINLESS STEEL
FIG	FIGURE	STD	STANDARD
FOC	FACE OF CURB	THK	THICK
FP	FUEL POST (TIME FILLED)	THRU	THROUGH
FSSP	FUEL SYSTEM SUPPORT PANEL	TOC	TOP OF CURB
FX	FIRE EXTINGUISHER	XFMR	TRANSFORMER (ELECTRICAL UTILITY)
GALV	GALVANIZED	TYP	TYPICAL
GND	GROUND	UNO	UNLESS NOTED OTHERWISE
GRC	GALVANIZED RIGID CONDUIT	VERT	VERTICAL
HC	HANDICAP		
HP	HORSE POWER		
HORIZ	HORIZONTAL		

Please add note(s) stating Buy America Requirements for this project
Please add note(s) about DBE requirements for this project.
Please also include a note stating that the contractor is required to obtain and maintain all permits for this project.

RELEVANT CODES AND STANDARDS

THE WORK SHALL CONFORM TO THE MOST RECENT EDITION OF THE FOLLOWING CODES AND STANDARDS AS SUPPLEMENTED, AMENDED, OR OTHERWISE MODIFIED BY LOCAL REQUIREMENTS:

INTERNATIONAL BUILDING CODE (IBC) 2012
INTERNATIONAL FIRE CODE (IFC) 2012
INTERNATIONAL PLUMBING CODE (IPC) 2012
INTERNATIONAL MECHANICAL CODE (IMC) 2012
INTERNATIONAL FUEL GAS CODE 2012

NFPA 52 VEHICULAR FUEL SYSTEMS CODE 2013
NFPA 70 NATIONAL ELECTRICAL CODE (NEC) 2014
NFPA 79 ELECTRICAL STANDARD FOR MECHANICAL EQUIPMENT 2012

IN THE EVENT OF A CONFLICT BETWEEN DRAWINGS, WRITTEN SPECIFICATIONS, AND/OR REFERENCED STANDARDS, THE MOST STRINGENT SHALL GOVERN.

PROJECT TEAM

OWNER (S)

MESA COUNTY, COLORADO
ATTN: TODD HOLLENBECK
PO BOX 20000
GRAND JUNCTION, CO 81502
(970) 255-7168

PROJECT CONTACT(S)

CLEAN ENERGY
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4675 MACARTHUR COURT SUITE 800
NEWPORT BEACH, CA 92660
(949) 437-9017

ENGINEER OF RECORD

CLEAN ENERGY
ATTN: RICHARD L. REMILLARD, PE
4675 MACARTHUR COURT SUITE 800
NEWPORT BEACH, CA 92660
(949) 437-9027

SURVEYOR

CITY OF GRAND JUNCTION
ATTN: TRENT PRALL
250 N. 5TH STREET
GRAND JUNCTION, CO 81501
(970)256-4047

CIVIL ENGINEER

GREENBERG-FARROW
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1430 W. PEACHTREE ST. NW, SUITE 200
ATLANTA, GA 30309
(404) 601-4000

GEOTECHNICAL

HUDDLESTON-BERRY ENGINEERING & TESTING, LLC
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MECHANICAL AND ELECTRICAL

CLEAN ENERGY
ATTN: RICHARD L. REMILLARD, PE
4675 MACARTHUR COURT SUITE 800
NEWPORT BEACH, CA 92660
(949) 437-9027

EXP. DATE: 10/31/2017
COLORADO LICENSED
RICHARD L. REMILLARD
0047005
PROFESSIONAL ENGINEER
DATE SIGNED:

REV	DATE		BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT
		REVISIONS	

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4675 MACARTHUR COURT, SUITE 800 | NEWPORT BEACH, CA 92660
TEL: (949) 437-1000 | FAX: (949) 476-3827 | WWW.CLEANENERGYFUELS.COM

CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
COVER SHEET

ASSET NO: 160-11-17307.02.00

DATE 05/01/2017	DESIGNED BY HVT CHECKED BY MES APPROVED BY RLR
SCALE	AS NOTED
SHEET	CS–1.0

W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (29820.0092.0)\Drawings and Engineering\003-CS1-COVER SHEET.dwg - PLOTTED: May 12, 2017 - 1:27pm

SPECIAL CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. THE CONTRACTOR SHALL PERFORM ALL WORK REQUIRED FOR THE CONSTRUCTION OF THE COMPRESSED NATURAL GAS (CNG) FUELING FACILITY AND RELATED STRUCTURES TO BE CONSTRUCTED HEREUNDER AS NECESSARY TO MAKE A COMPLETE AND WORKING INSTALLATION, EXCEPT FOR WORK SPECIFICALLY EXCLUDED.

B. ALL PHASES OF THE PROJECT SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE APPROVED CONSTRUCTION DRAWINGS. IF THERE IS ANY CONFLICT BETWEEN THIS DOCUMENT AND THE DRAWINGS, THE DRAWING(S) SHALL GOVERN AND THE ENGINEER SHALL BE NOTIFIED.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ARRANGING FOR ALL REQUIRED INSPECTIONS AT THE APPROPRIATE STAGES OF CONSTRUCTION. IF ANY OF THE CONTRACTOR'S WORK FAILS ANY INSPECTION, THE CONTRACTOR SHALL TAKE THE APPROPRIATE MEASURES TO CORRECT ANY DEFICIENCY AT NO EXPENSE TO CLEAN ENERGY.

E. THE CONTRACTOR'S WORK SHALL CONFORM TO ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS OF THE STATE, COUNTY, AND CITY INVOLVED. APPROVED DRAWINGS AND PERMITS SHALL NOT BE CONSTRUED AS LICENSE TO CONSTRUCT WORK NOT CONFORMING WITH THE GOVERNING CODES AND SHALL NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH THE GOVERNING CODES, PLANS, AND SPECIFICATIONS.

1.2 MATERIALS

A. THE CONTRACTOR SHALL HANDLE AND INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THE REQUIREMENTS IN THESE CONSTRUCTION SPECIFICATIONS.

B. CLEAN ENERGY SHALL PROVIDE THE CONTRACTOR WITH MAJOR EQUIPMENT ASSEMBLIES LISTED AS "CLEAN ENERGY FURNISHED" IN THIS SPECIFICATION OR THE DRAWINGS. CLEAN ENERGY FURNISHED EQUIPMENT AND MATERIAL WILL BE DELIVERED TO THE JOB SITE BY CLEAN ENERGY AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR UNLOADING AND PROPERLY STORING THEM ON THE CONSTRUCTION SITE TO ENSURE NO DAMAGE IS DONE TO EQUIPMENT OR MATERIAL (I.E. RAIN, VANDALISM, ETC). ON-SITE STORAGE LOCATION(S) SHALL BE COORDINATED WITH CLEAN ENERGY.

1.3 MATERIAL HANDLING AND STORAGE

A. AFTER RECEIPT OF CLEAN ENERGY FURNISHED MATERIALS BY THE CONTRACTOR, ANY SHORTAGES OF AND/OR DAMAGES TO THE MATERIALS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE FINANCIALLY ACCOUNTABLE FOR SUCH SHORTAGES, ERRORS, OR DAMAGES.

B. THE CONTRACTOR SHALL BE FINANCIALLY ACCOUNTABLE FOR LOST OR STOLEN CLEAN ENERGY FURNISHED EQUIPMENT.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER STORAGE AND HANDLING OF ALL CLEAN ENERGY FURNISHED EQUIPMENT AND MATERIAL UNTIL THE INSTALLATION IS ACCEPTED BY CLEAN ENERGY'S REPRESENTATIVE.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAULING AWAY ALL UNUSED CONTRACTOR SUPPLIED MATERIALS, WASTE, AND SPOILS. ALL CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE SITE DAILY AND DISPOSED OF IN A LEGAL MANNER.

E. ALL UNUSED CLEAN ENERGY SUPPLIED MATERIAL SHALL BE RETURNED TO CLEAN ENERGY UPON COMPLETION OF CONSTRUCTION.

1.4 USE OF SITE, TEMPORARY UTILITIES AND INSPECTIONS

A. THE CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE DESIGNATED CONSTRUCTION SITE AND STORAGE AREAS DURING EXECUTION OF THIS WORK.

B. PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN APPROVAL FROM CLEAN ENERGY'S REPRESENTATIVE FOR ON-SITE DIRT REMOVAL OR STOCK PILING TO INSURE MINIMUM DISRUPTION OF EXISTING SITE OPERATION.

C. EVERY REQUEST FOR INSPECTION SHALL REQUIRE A FORTY-EIGHT (48) HOUR ADVANCE NOTICE BEFORE SUCH INSPECTION IS DESIRED.

1.5 START-UP PROCEDURES

A. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY TEMPORARY CLEARANCES TO RELEASE GAS AND ELECTRICAL SERVICE FOR START-UP. THIS WILL NOT INCLUDE FINAL INSPECTION BY AGENCIES WHICH REQUIRE A CERTIFICATE TO OPERATE.

B. THE CONTRACTOR SHALL NOTIFY CLEAN ENERGY'S PROJECT MANAGER A MINIMUM OF THREE (3) WEEKS BEFORE THE DATE THE SYSTEM CAN BE STARTED SO AS TO COORDINATE START-UP WITH THE EQUIPMENT VENDOR(S) AND/OR APPROVED REPRESENTATIVES.

C. THE CONTRACTOR SHALL HAVE QUALIFIED ELECTRICAL AND MECHANICAL REPRESENTATIVES PRESENT DURING START-UP TO MAKE ANY NECESSARY REPAIRS IN THE EVENT OF LEAKS OR FAILURES.

[and Owner]

D. A WALK-THROUGH SHALL BE MADE AFTER START-UP WITH CLEAN ENERGY REPRESENTATIVES. THE ITEMS ON THE PUNCH LIST DEVELOPED DURING THIS WALK-THROUGH SHALL BE COMPLETED WITHIN TEN (10) WORKING DAYS.

[and Owner]

E. FINAL WALK-THROUGH SHALL BE CONDUCTED WITH THE CLEAN ENERGY PROJECT MANAGER, ENGINEER OR THEIR AUTHORIZED REPRESENTATIVE, AND THE CONTRACTOR TO SIGN OFF THE COMPLETION OF THE PUNCH LIST ITEMS. ALL ITEMS SHALL BE COMPLETED AND SIGNED OFF BEFORE RETENTION MONEY WILL BE PAID TO THE CONTRACTOR.

[In coordination with Owner.]

1.6 DRAWINGS

A. FINAL INTERPRETATION OF ALL DRAWINGS WILL BE BY CLEAN ENERGY, IN CONSULTATION WITH THE ENGINEER, AND CLEAN ENERGY'S DECISION WILL BE FINAL.

[...by Clean Energy...]

B. TWO COMPLETE SETS OF "APPROVED FOR CONSTRUCTION" DRAWINGS WILL BE PROVIDED TO THE THE CONTRACTOR FIVE (5) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION.

C. ALL DRAWINGS PREPARED BY THE CONTRACTOR SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ADMITTING DRAWINGS INTO THE CONSTRUCTION DRAWING SET.

D. UPON SUBSTANTIAL COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL MARK-UP ONE (1) COPY OF "APPROVED FOR CONSTRUCTION" DRAWINGS TO AS-BUILT CONDITIONS. AS-BUILT DRAWINGS SHALL SHOW ALL SIGNIFICANT CHANGES, DIMENSIONS (INCLUDING DEPTH), AND RELATIVE POINTS OF REFERENCE. THESE ALTERED DRAWINGS SHALL BE SUBMITTED TO CLEAN ENERGY WITHIN TWO (2) WEEKS (TEN (10) WORKING DAYS) AFTER COMPLETION OF CONSTRUCTION. RETENTION RELEASE IS CONTINGENT UPON RECEIVING ACCURATE AS-BUILT DRAWINGS. [and Owner]

1.7 MISCELLANEOUS EQUIPMENT

A. THE CONTRACTOR SHALL PROVIDE MASTER LOCK, PADLOCKS, HI VIS, ALUMINUM, PRO SERIES PICK RESISTANT 5 PIN LOCKING MECHANISM WITH 2 KEYS AT LOCATIONS SPECIFIED. ALL GATES, PANELS AND DOORS SHALL INCLUDE A BLACK MASTER LOCK, GRAINGER #4RD90 THAT IS KEYED TO 10G504. ALL SAFETY RELIEF VALVES SHALL INCLUDE A RED MASTER LOCK, GRAINGER #4RD94 THAT IS KEYED TO 10G502.

[To whom? To the Owner?]

PART 2- CONCRETE & EARTHWORK

2.0 DESIGN PARAMETERS

A. THIS PROJECT HAS BEEN DESIGNED ACCORDING TO THE FOLLOWING CODES:

a. IBC 2012
b. ASCE 7-10
c. AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION
d. ACI 318-11
e. ACI 530-11
f. ACI 360-R (SLABS ON GRADE)
g. AWS D1.1-0
h. ASTM (AMERICAN SOCIETY FOR TESTING & MATERIALS)
i. C160 CRSI (CONCRETE REINFORCING STEEL INSTITUTE)
j. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) FOR ASPHALT PAVEMENT AND PAVEMENT MARKINGS

B. OPENINGS, POCKETS, ETC., LARGER THAN 6" SHALL NOT BE PLACED IN CONCRETE SLABS, DECKS, WALLS, UNLESS SPECIALLY DETAILED ON THE STRUCTURAL DRAWINGS. NOTIFY THE ENGINEER WHEN DRAWINGS BY OTHERS SHOW OPENINGS, POCKETS, ETC. LARGER THAN 6" NOT SHOWN ON THE DRAWINGS, BUT WHICH ARE LOCATED IN STRUCTURAL MEMBERS.

C. ASTM SPECIFICATIONS ON THE DRAWINGS SHALL BE OF THE LATEST REVISION.

D. DESIGN LOADS:
DEAD LOADS
EQUIPMENT:
a. COMPRESSOR = 14,500# / SKID (SINGLE)
b. DRYER = 2,470#

RISK CATEGORY: II

E. WIND ANALYSIS PER ASCE
BASIC WIND SPEED, (3-SECOND GUST): <120 MILES PER HOUR
WIND IMPORTANCE FACTOR: 1.0
WIND EXPOSURE: C
WIND LOAD: VARIES (SEE STRUCTURAL CALCULATIONS)

F. SEISMIC ANALYSIS PER ASCE UTILIZING THE EQUIVALENT LATERAL FORCE ANALYSIS
S_S = 80.0%g S_{DS} = 62.9%g
S_1 = 40.0%g S_{D1} = 42.7%g
SITE CLASS: D
SEISMIC DESIGN CATEGORY: D

2.1 CONCRETE

A. THE CONTRACTOR SHALL NOT MAKE ANY CONCRETE POURS WITHOUT FIRST NOTIFYING CLEAN ENERGY.

B. IF FOUNDATION SLABS AND FOOTINGS ARE POURED PRIOR TO TRENCHING FOR PIPING AND ELECTRICAL, SLEEVES ARE REQUIRED UNDER BLOCK WALL FOOTINGS OR EQUIPMENT FOUNDATIONS FOR ALL PROPOSED GAS PIPING OR ELECTRICAL CONDUITS PASSING UNDER FOOTINGS OR FOUNDATIONS.

C. CEMENT SHALL MEET IBC STANDARDS FOR PORTLAND CEMENT & BLENDED HYDRAULIC CEMENTS.

D. READY MIX CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH REQUIREMENTS OF IBC STANDARDS. BATCH TICKETS WILL BE RETURNED TO CLEAN ENERGY.

E. REINFORCED CONCRETE IS DESIGNED BY THE "ULTIMATE STRENGTH DESIGN METHOD".

F. CONCRETE NORMAL WEIGHT IS 150 PCF. UNLESS NOTED OTHERWISE.

G. CONCRETE MIXING OPERATION, ETC. SHALL CONFORM TO ASTM C94.

H. CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND SHALL BEAR THE WET SEAL OF A CIVIL ENGINEER, LICENSED IN THE STATE THE PROJECT IS LOCATED, FOR REVIEW BY THE ENGINEER. THE MIX DESIGNS SHALL STATE THE PROJECT NAME AND THE INTENDED USAGE OF THE CONCRETE.

I. SCHEDULE OF STRUCTURAL CONCRETE 28-DAY STRENGTH AND TYPES:

LOCATION OF CONCRETE	STRENGTH, psi	TYPE
FOOTINGS	4500*	HARD ROCK
SLAB ON GRADE	4500*	HARD ROCK
MISCELLANEOUS	4500*	HARD ROCK

* DESIGN STRENGTH = 4500 psi
* PER TABLE 4.3.1 - CONCRETE MIX SHALL BE DESIGNED FOR EXPOSURE CLASSES F1 S0, P0 AND C0.

J. PORTLAND CEMENT SHALL CONFORM TO ASTM C150, TYPE V IN CONTACT WITH SOIL AND TYPE II ELSEWHERE. CEMENT SHALL HAVE AN EQUIVALENT ALKALINE CONTENT LESS THAN 0.6%.

K. AGGREGATE FOR HARDROCK CONCRETE SHALL CONFORM TO ALL REQUIREMENTS AND TESTS OF ASTM C33. AGGREGATE SHALL BE NON-REACTIVE

L. FLY ASH OR POZZOLANS, IF USED, SHALL CONFORM WITH ASTM C618. USAGE SHALL NOT EXCEED 15 PERCENT BY WEIGHT OF THE TOTAL OF CEMENTITIOUS MATERIALS. POZZOLANS USED TO MITIGATE THE EFFECT OF SULFATE CONTAINING SOILS SHALL BE DETERMINED BY TEST OR SERVICE RECORD.

M. PLACEMENT OF CONCRETE SHALL CONFORM TO SECTION 1905 OF THE BUILDING CODE.

O. ALL REINFORCING BARS, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL BE WELL-SECURED IN POSITION PRIOR TO PLACING CONCRETE.

P. MECHANICAL PIPES AND ELECTRICAL CONDUITS WHICH PASS THROUGH SLAB ON GRADE, DO NOT REQUIRE SLEEVES, UNLESS OTHERWISE NOTED. IF SLEEVES ARE REQUIRED, INSTALL SLEEVES BEFORE PLACING CONCRETE. DO NOT CUT ANY REINFORCING WHICH MAY INTERFERE WITH SLEEVE PLACEMENT. CORING OPENINGS IN CONCRETE IS NOT PERMITTED. NOTIFY THE ENGINEER IN ADVANCE OF CONDITIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

Q. CONTRACTOR SHALL SUBMIT MINIMUM OF TWO COPIES OF REBAR SHOP DRAWINGS SHOWING ALL BENDS, LAPS, HOOKS AND CHAINS REQUIRED FOR THE PROPER CONSTRUCTING OF THE REINFORCING ON PLANS.

R. ALL CONCRETE SLABS WILL BE A SMOOTH TROWEL FINISH ON ALL CURB FACES AND EDGES WITH BROOM FINISH ON ALL FLAT SURFACES EXCEPT WHEN MATCHING EXISTING CONCRETE SURFACES. ALL SLAB FINISHES SHALL BE FREE OF STAINS, DISCOLORATION, VOIDS, CRACKS, OR SURFACE DISCONTINUITIES. IF ANY OF THESE CONDITIONS EXIST, CLEAN ENERGY WILL REQUIRE THE CONTRACTOR TO REPLACE THE SLAB. THE CONTRACTOR SHALL VERIFY WITH CLEAN ENERGY WHICH TYPE OF BROOM FINISH WHICH WILL BE ACCEPTABLE.

2.2 REINFORCING STEEL

A. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF BUILDING CODE AND ASTM 615 OR ASTM A706 GRADE 60.

B. BARS SHALL BE CLEAN OF RUST, GREASE, OR OTHER MATERIALS LIKELY TO IMPAIR BOND. ALL REINFORCING BAR BENDS SHALL BE MADE COLD.

C. REINFORCING BAR SPLICES SHALL BE MADE AS INDICATED ON THE DRAWINGS. LAP ALL HORIZONTAL BARS AT CORNERS AND INTERSECTIONS. STAGGER ALL SPLICES UNLESS NOTED OTHERWISE ON PLANS.

D. ALL BARS SHALL BE MARKED SO THEIR IDENTIFICATION CAN BE MADE WHEN THE FINAL IN-PLACE INSPECTION IS MADE.

E. BARS IN SLABS SHALL BE SECURELY SUPPORTED ON WELL-CURED CONCRETE BLOCKS OR APPROVED METAL CHAIRS, PRIOR TO PLACING CONCRETE.

F. REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE ACI 318 AND ACI 530 MANUALS.

G. MILL TEST REPORTS FOR GRADE 60 BARS SHALL BE SUBMITTED PRIOR TO PLACEMENT OF CONCRETE.

H. CONCRETE PROTECTION FOR REINFORCEMENT

	MIN COVER (INCHES)
a. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:	3
b. CONCRETE EXPOSED TO EARTH OR WEATHER:	
NO. 6 THROUGH NO. 18 BARS	2
NO. 5 BAR, W31 OR D31 WIRE AND SMALLER	1½
c. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:	
SLABS, WALLS, JOISTS:	
NO 14. AND NO. 18 BARS	1½
NO. 11 BAR AND SMALLER	¾
BEAMS, COLUMNS:	
PRIMARY REINFORCEMENT, TIES, STIRRUPS, AND SPIRALS	1½

I. DEVELOPMENT AND SPLICES OF REINFORCEMENT SHALL CONFORM TO ACI 318, CHAPTER 12 FOR CONCRETE AND ACI 530 FOR MASONRY. FOR CONCRETE, SEE PLANS AND DETAILS.

EXP. DATE: 10/31/2017
COLORADO LICENSED PROFESSIONAL ENGINEER
PE 0046745
DATE SIGNED:

GreenbergFarrow
1430 W. PEACHTREE ST. NW SUITE 200
ATLANTA, GA 30309
PHONE: (404) 601-4000
FAX: (404) 601-3970

REV	DATE	REVISIONS	BY
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CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
GENERAL NOTES

ASSET NO: 160-11-17307.02.00

DATE	DESIGNED BY	HVT
05/01/2017	CHECKED BY	MES
	APPROVED BY	RLR

SCALE: AS NOTED

SHEET: G-0.0

W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.00)\2.0 Drawings and Engineering\002-G00-GENERAL NOTES.dwg - PLOTTED: May 12, 2017 - 1:27pm

2.3 EARTHWORK AND FOUNDATION DESIGN

A. EARTHWORK SHALL BE PER GEOTECHNICAL ENGINEERING REPORT PREPARED BY HUDDLESTON-BERRY ENGINEERING & TESTING, LLC DATED JANUARY 25, 2017; PROJECT NO. 00580-0055.

B. EXCAVATION SHALL BE PERFORMED AT SPECIFIED LOCATIONS AS REQUIRED PER APPROVED DRAWINGS. ALL FOOTINGS SHALL BE PLACED ON UNDISTURBED NATURAL EARTH OR ON PREPARED SUBGRADE, PER THE GEOTECHNICAL ENGINEERING REPORT IN SECTION 2.3.D OR COMPACTED TO 95% PROCTOR.

C. THE CONTRACTOR SHALL NOTIFY CLEAN ENERGY IN WRITING FOR ANY POTENTIAL TRENCHING DEVIATION FROM APPROVED PLANS OR EXCAVATING PROBLEMS PRIOR TO START OF CONSTRUCTION. NEGLIGENCE SHALL NOT CONSTITUTE A CHANGE ORDER.

D. ANY MATERIALS USED FOR BACKFILL SHALL BE CLEAN AND FREE OF ALL DEBRIS (WOOD SCRAPS, WELDING ROD, PIPE SCRAPS, OR OTHER DELETERIOUS SUBSTANCES). NO LUMPS OR ROCK LARGER THAN 4 INCHES IN DIAMETER ARE ALLOWED WITHIN TWELVE (12) INCHES OF ANY FOUNDATION. BACKFILL MATERIAL SHALL BE AS PER GEOTECHNICAL REPORT.

E. ALL BACKFILL UNDER FOUNDATIONS AND SLABS SHALL BE COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR AT THE OPTIMUM MOISTURE CONTENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COST OF OBTAINING A COMPACTION REPORT AND SUBMITTING THE RESULT TO THE CLEAN ENERGY.

F. ALL TRENCHES FOR GAS PIPES SHALL HAVE A MINIMUM COVER OF EIGHTEEN (18) INCHES ABOVE THE TOP OF PIPE (OR SLEEVE) FROM FINISH GRADE. A MINIMUM OF TWELVE (12) INCHES OF SAND SHALL BE PROVIDED BELOW THE PIPE AND SIX (6) INCHES ABOVE THE PIPE.

G. ALL TRENCHES FOR ELECTRICAL CONDUITS SHALL HAVE A MINIMUM COVER OF TWENTY-FOUR (24) INCHES ABOVE THE TOP OF CONDUIT FROM FINISH GRADE. BACKFILL SHALL BE CLEAN NATURAL SOIL UNLESS OTHERWISE SPECIFIED.

H. EXPANSIVE SOILS SHALL REQUIRE THAT ELECTRICAL CONDUIT(S) TRENCHES BE FILLED WITH SAND A MINIMUM SIX (6) INCHES ABOVE THE TOP OF CONDUIT.

I. SLURRY BACKFILL MAY BE USED AT THE CONTRACTOR'S EXPENSE INSTEAD OF SOIL FOR BACKFILL TO EXPEDITE COMPLETION OF TRENCHES WITH CLEAN ENERGY'S PRIOR WRITTEN APPROVAL.

J. EXISTING ASPHALT SHALL BE SAWCUT TO ALLOW PLACEMENT OF FOOTINGS AND SLABS. ASPHALT SHALL BE PATCHED TO MATCH THE EXISTING ORIGINAL GRADE. THE CONTRACTOR SHALL ENSURE THAT PATCHED AREAS DO NOT POND. ALL SURFACES, BOTH VERTICAL AND HORIZONTAL, TO RECEIVE ASPHALT PATCHING SHALL HAVE AN ACCEPTABLE BONDING AGENT, SUCH AS SS1 OR AR4000, APPLIED PRIOR TO APPLICATION OF ASPHALT.

K. THE CONTRACTOR SHALL PROTECT OPEN TRENCHES OR EXCAVATIONS FROM WATER RUN OFF OR RAIN. THE CONTRACTOR SHALL ANTICIPATE AND BE PREPARED TO AVOID ANY DELAYS DUE TO WATER INFILTRATION OR RAIN.

L. THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL CONTAMINATED SOILS, HAZARDOUS WASTE, AND / OR OTHER MATERIALS DUE TO CONTRACTOR'S WORK AT CONTRACTOR'S EXPENSE. PACKAGE AND TRANSPORT ALL HAZARDOUS MATERIALS TO AN APPROVAL WASTE FACILITY. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL RULES, REGULATIONS, AND REQUIREMENTS AND SHALL BE RESPONSIBLE FOR THE HAZARDOUS WASTE MANIFEST SHIPPING FROM THE POINT OF GENERATION, THROUGH TRANSPORTATION, TO THE FINAL APPROVED TREATMENT, STORAGE, AND DISPOSAL FACILITY.

M. THE CONTRACTOR SHALL INVESTIGATE THE SITE DURING CLEARING AND EARTHWORK OPERATIONS FOR FILLED EXCAVATIONS OR BURIED STRUCTURES SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC. IF ANY SUCH STRUCTURES ARE FOUND, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

N. FOOTINGS ARE DESIGNED BASED ON THE FOLLOWING INFORMATION:

ALLOWABLE BEARING* = 1,500 PSF

* VALUES MAY BE INCREASED BY 1/3 FOR WIND OR SEISMIC LOAD CASES.

FOOTINGS SHALL BEAR ON FIRM NATURAL SOILS. MINIMUM DEPTH OF FOOTINGS BELOW LOWEST ADJACENT FINAL GRADE SHALL BE 40"; MINIMUM WIDTH OF FOOTING SHALL BE 18", UNLESS NOTED OTHERWISE ON PLAN OR IN SOILS REPORT.

O. CONTRACTOR SHALL PROVIDE FOR DESIGN AND INSTALLATION OF ALL CRIBBING, SHEATHING AND SHORING REQUIRED AND SHALL BE SOLELY RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY ORDINANCES.

P. EXCAVATION FOR FOOTINGS SHALL BE APPROVED BY THE INSPECTOR OR ENGINEER PRIOR TO PLACING THE CONCRETE AND REINFORCING. CONTRACTOR TO NOTIFY THE INSPECTOR WHEN INSPECTION OF EXCAVATION IS READY.

Q. ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED. DO NOT PLACE BACKFILL BEHIND RETAINING WALLS BEFORE CONCRETE OR GROUT HAS ATTAINED FULL DESIGN STRENGTH. CONTRACTORS SHALL BRACE OR PROTECT ALL BUILDING AND PIT WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHING FLOORS ARE COMPLETELY IN PLACE AND HAVE ATTAINED FULL STRENGTH. CONTRACTOR SHALL PROVIDE FOR DESIGN, PERMITS AND INSTALLATION OF SUCH BRACING.

R. FOUNDATIONS SHALL BE PLACED AND ESTIMATED ACCORDING TO DEPTHS SHOWN ON DRAWINGS. SHOULD SOIL ENCOUNTERED AT THESE DEPTHS NOT BE APPROVED BY THE INSPECTOR OR ENGINEER, FOUNDATION ELEVATIONS WILL BE ALTERED BY CHANGE ORDER.

S. FOOTING BACKFILL AND UTILITY TRENCH BACKFILL WITHIN THE BUILDING PERIMETER SHALL BE MECHANICALLY COMPACTED IN LAYERS IN ACCORDANCE WITH THE SOILS REPORT AND APPROVED BY THE ENGINEER. FLOODING WILL NOT BE PERMITTED. ALL FILLS USED TO SUPPORT FOUNDATIONS SHALL BE INSPECTED BY THE ENGINEER REPRESENTATIVE.

T. SLABS ON GRADE SHALL BE SUPPORTED ON COMPACTED FILL AS PER THE RECOMMENDATIONS OF THE SOILS REPORT.

2.4 STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL BE DESIGNED, DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE ACIS 'SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS' AND 'CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES'.

2. MATERIALS:

WIDE FLANGE	ASTM A992 G50
ANGLES, CHANNELS, PLATES AND BARS	ASTM A36
PIPES	ASTM 53 GR B, Fy=35ksi
HSS SECTIONS	ASTM A500 GR B, Fy=46ksi
BOLTS	ASTM A325N
ANCHOR BOLTS	ASTM F1554, UNO.

3. STRUCTURAL STEEL SURFACES THAT ARE NOT EXPOSED TO WEATHER SHALL BE LEFT UNPAINTED.

4. WELDED JOINTS SHALL CONFORM TO THE PREQUALIFIED JOINT DETAILS AS INDICATED IN THE STRUCTURAL WELDING CODE (AWS D1.1) BY THE AMERICAN WELDING SOCIETY. WELDS SHALL BE MADE USING A FILLER METAL HAVING 70 KSI MINIMUM TENSILE STRENGTH, FILLER METAL SHALL HAVE A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT-LBS AT 0 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.

5. WELD LENGTHS CALLED FOR ON PLANS ARE THE NET EFFECTIVE LENGTH REQUIRED. WELD SIZE SHALL BE AISC MINIMUM UNLESS A LARGER SIZE IS NOTED.

6. WELDING TESTS AND INSPECTIONS, SEE SPECIFICATIONS.

7. PAINT PRIME OR GALVANIZE EXPOSED STEEL.

2.5 POST INSTALLED ANCHORS

1. EXPANSION AND SCREW ANCHORS SHALL BE IN CONFORMANCE WITH ACI 318, APPENDIX D AND ICC-ES ACCEPTANCE CRITERIA AC 193.

2. ANCHORS SHALL BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.

3. HOLES DRILLED INTO REINFORCED CONCRETE SHALL NOT DAMAGE OR CUT EXISTING REINFORCING STEEL. HOLES DRILLED INTO PRE-STRESSED OR POST-TENSIONED CONCRETE SHALL HAVE A CLEARANCE OF 1" MINIMUM FROM TENDONS. LOCATE EXISTING TENDONS USING NON-DESTRUCTIVE METHODS PRIOR TO DRILLING.

4. EPOXY ADHESIVE USED FOR SETTING DOWELS AND ANCHORS SHALL BE IN CONFORMANCE WITH ACI318 APPENDIX D AND ICC-ES ACCEPTANCE CRITERIA AC 308.

5. ANCHORS OR DOWELS EMBEDDED IN EPOXY SHALL BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.

6. HOLES RECEIVING EPOXIED ANCHORS SHALL BE CLEAN AND FREE OF DUST PRIOR TO APPLYING EPOXY ADHESIVE.

7. EPOXY ANCHORS SHALL NOT BE INSTALLED IN THE UNDERSIDE OF FLOORS OR ROOFS.

8. EXPANSION AND EPOXY ANCHORS SHALL BE AS NOTED ON PLANS.

9. APPROVED ANCHORING METHODS ARE TO BE USED FOR ANCHORING EQUIPMENT AS SPECIFIED ON DRAWINGS. CLEAN ENERGY AND ENGINEER SHALL BE NOTIFIED AND CONSULTED FOR ANY REQUIRED CORRECTION METHODS FOR MISPLACED BOLTS OR ANCHORS.

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YEHIA SHIRMOHAMMADI
PE 0046745
PROFESSIONAL ENGINEER
DATE SIGNED:

CNG FUELING FACILITY
GRAND VALLEY TRANSIT
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GRAND JUNCTION, CO 81501
GENERAL NOTES

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TABLE 1705.3

REQUIRED SPECIAL INSPECTIO TESTS OF CONCRETE CONSTRUCTION (Check)

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]	IBC REFERENCE
1. Inspect reinforcement, including prestressing tendons, and verify placement.	—	X	ACI 318 Ch. 20, 25.2, 25.3, 26.5.1-26.5.3	1908.4
2. Reinforcing bar welding: a. Verify weldability of reinforcing bars other than ASTM A 706; b. Inspect single-pass fillet welds, maximum $^5/_{16}$"; and c. Inspect all other welds.	 — X	 X X 	AWS D1.4 ACI 318: 26.5.4	—
3. Inspect anchors cast in concrete.	—	X	ACI 318: 17.8.2	—
4. Inspect anchors post-installed in hardened concrete members.[b] a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads. b. Mechanical anchors and adhesive anchors not defined in 4.a.	 X 	 X	 ACI 318: 17.8.2.4 ACI 318: 17.8.2	 —
5. Verify use of required design mix.	—	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318: 26.4.5, 26.12	1908.10
7. Inspect concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 26.4.5	1908.6, 1908.7, 1908.8
8. Verify maintenance of specified curing temperature and techniques.	—	X	ACI 318: 26.4.7-26.4.9	1908.9
9. Inspect prestressed concrete for: a. Application of prestressing forces; and b. Grouting of bonded prestressing tendons.	 X X	 — —	 ACI 318: 26.9.2.1 ACI 318: 26.9.2.3	—
10. Inspect erection of precast concrete members.	—	X	ACI 318: Ch. 26.8	—
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 26.10.2	—
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 26.10.1(b)	—

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1705.12, Special inspections for seismic resistance.

b. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with 17.8.2 in ACI 318, or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work.

TABLE 1705.6

REQUIRED SPECIAL I TIONS AND TESTS OF SOILS (Check)

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	—	X
2. Verify excavations are extended to proper depth and have reached proper material.	—	X
3. Perform classification and testing of compacted fill materials.	—	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	—
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	—	X

Table Cut off

SPECIAL INSPECTIONS

1. SPECIAL INSPECTIONS SHALL BE IN CONFORMANCE WITH SECTION 1704 OF THE BUILDING CODE AND LOCAL AMENDMENTS.
2. INSPECTIONS SHALL BE PERFORMED BY AN INDEPENDENT INSPECTION COMPANY APPROVED BY THE AGENCY WITH JURISDICTION OVER THE PROJECT LOCATION. FORWARD ALL INSPECTION CORRESPONDENCE TO THE ENGINEER OF RECORD.
3. SPECIAL INSPECTION IS REQUIRED AS SHOWN ON THIS SHEET.

SPECIAL INSTALLATION CRITERIA

1. THE FOUNDATION STRUCTURES UNDER THE COMPRESSOR SHALL BE WITHIN ¼" MEASURED ACROSS ITS LENGTH, WIDTH, AND CORNER TO CORNER. THE FLATNESS OF THE FINISHED CONCRETE SHALL BE WITHIN ⅛" ON A 10'-0" DIAMETER CIRCLE MEASURED USING THE STRAIGHT EDGE METHOD. PROVIDE AT LEAST A SMOOTH HAND TROWLED FINISH ACROSS WITH A LIGHT BROOM FINISH ON THE OUTER 2'-0" OF THE PERIMETER OF THE FOUNDATION PAD.

Table Cut off

TABLE 1705.7

REQUIRED SPECIAL INSPECTIONS AN S OF DRIVEN DEEP FOUNDATION ELEMENTS (Check)

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INS
1. Verify element materials, sizes and lengths comply with the requirements.	X	—
2. Determine capacities of test elements and conduct additional load tests, as required.	X	—
3. Inspect driving operations and maintain complete and accurate records for each element.	X	—
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	X	—
5. For steel elements, perform additional special inspections in accordance with Section 1705.2.	—	—
6. For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.3.	—	—
7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.	—	

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DATE SIGNED:

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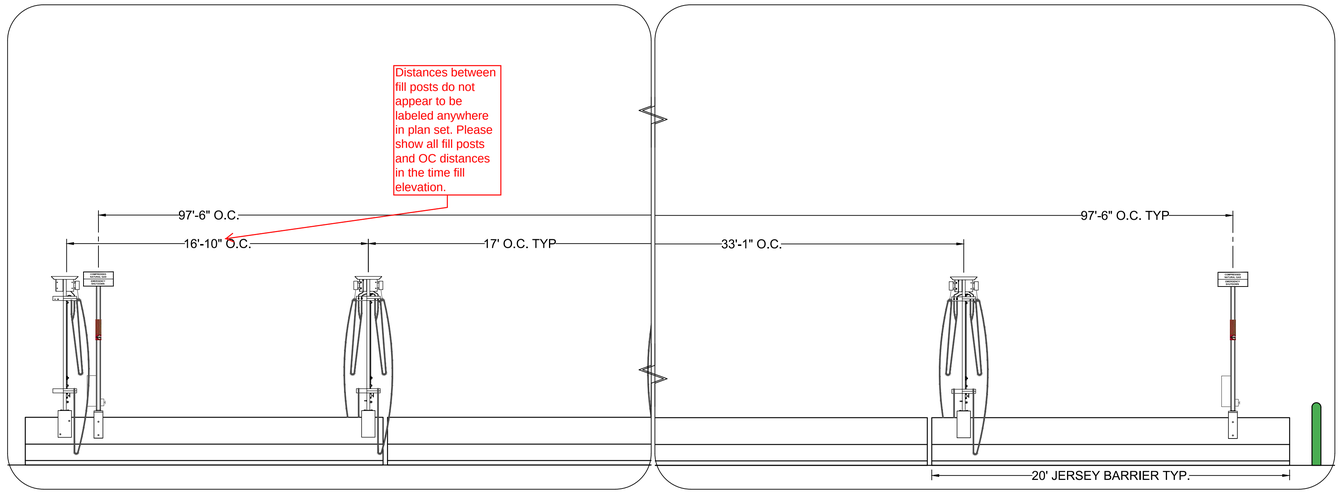
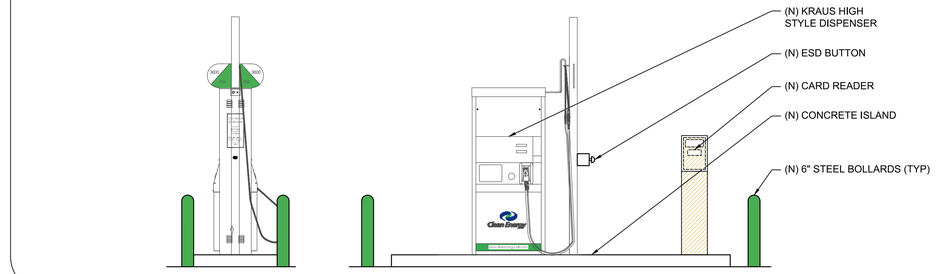


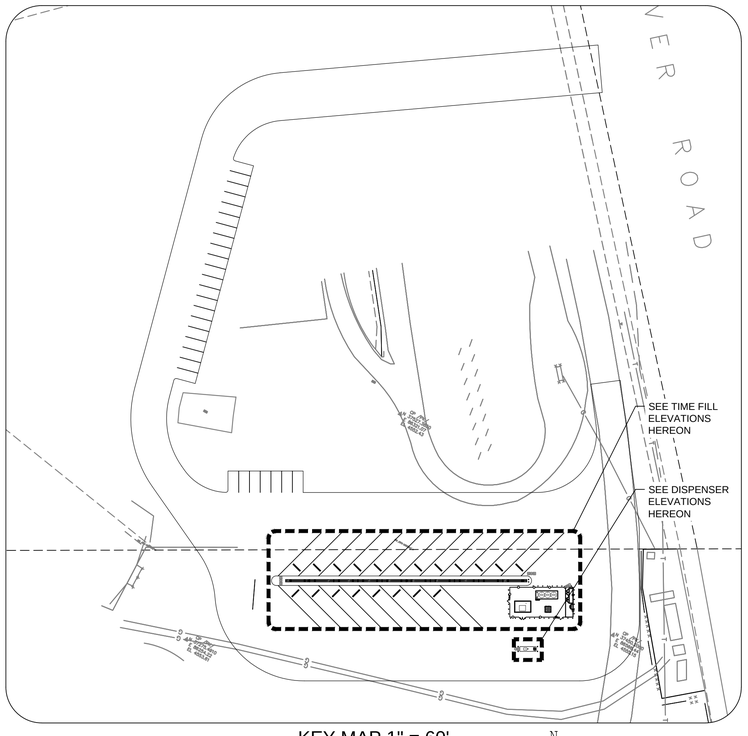
TIME FILL ELEVATIONS 1"=4'

4' 2' 0' 4' 8'

GRAPHIC SCALE



DISPENSER ISLAND ELEVATION 1"=3'



KEY MAP 1" = 60'

60 30' 0' 60' 120'

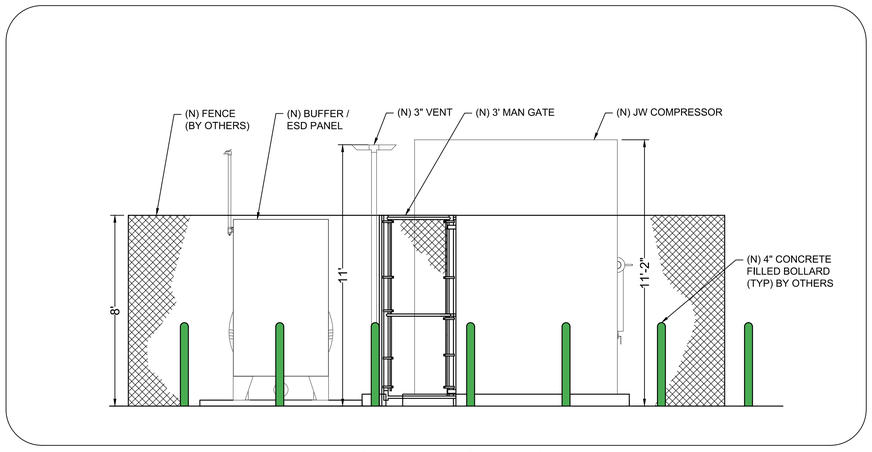
GRAPHIC SCALE

N W E S

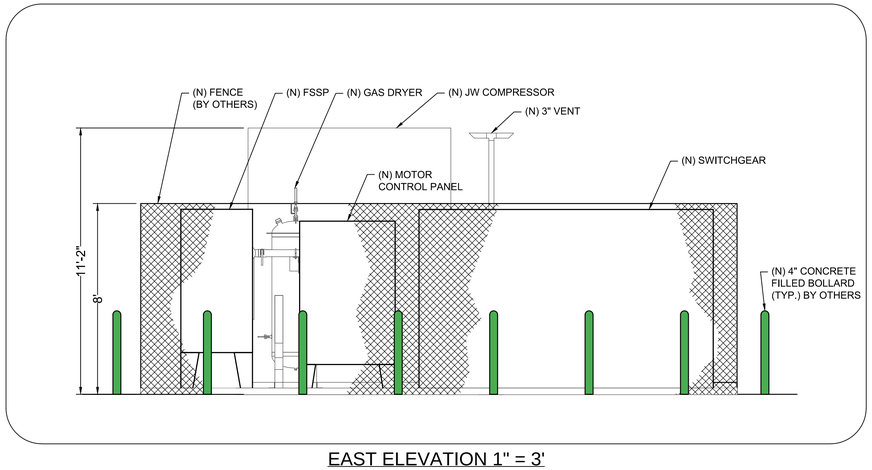
COLOR CHART		
ITEM	COLOR	
CANOPY	WHITE	
BOLLARDS / COVERS	GREEN -PANTONE 361 EC (SEE NOTE 1)	

NOTES

1. COLOR IS TO MATCH PANTONE COLOR SYSTEM OR EQUIVALENT 1101 HIGH GLOSS LAQUER ENAMEL OR EQUIVALENT.
2. CONTRACTOR SHALL PRIME AND PAINT OR PROVIDE GREEN PLASTIC COVERS ON ALL BOLLARDS AND RAILING.
3. CONTRACTOR SHALL PRIME ALL BOLLARDS USING PLASTIC COVERS FOR CORROSION PROTECTION.
4. PERIMETER FENCING SLATS TO MATCH EXISTING COLOR.



WEST ELEVATION 1" = 3'



EAST ELEVATION 1" = 3'

3' 1.5' 0' 3' 6'

GRAPHIC SCALE

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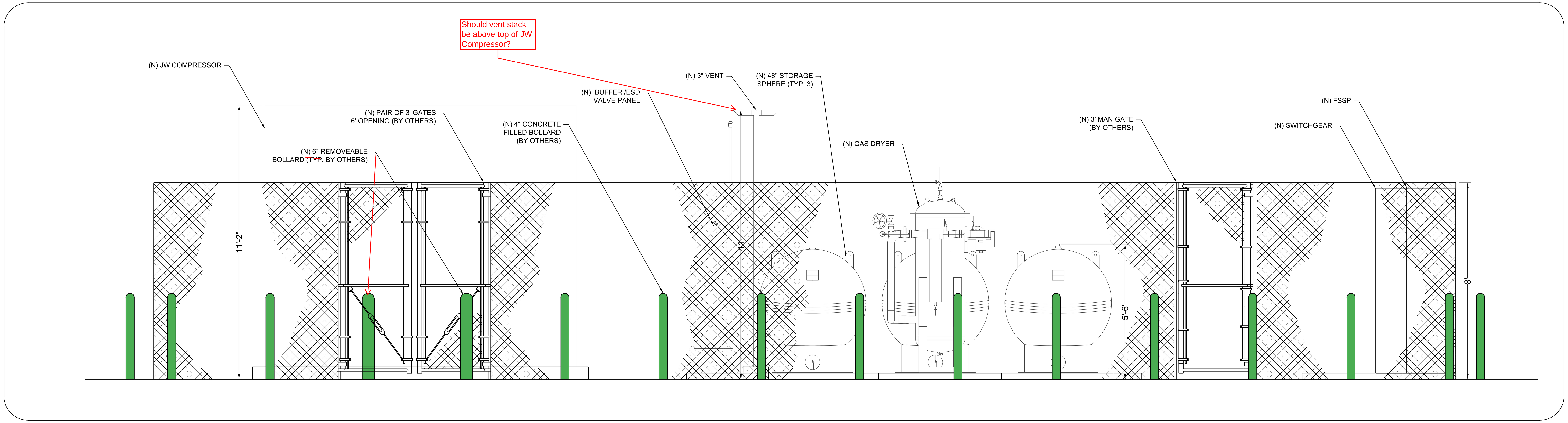
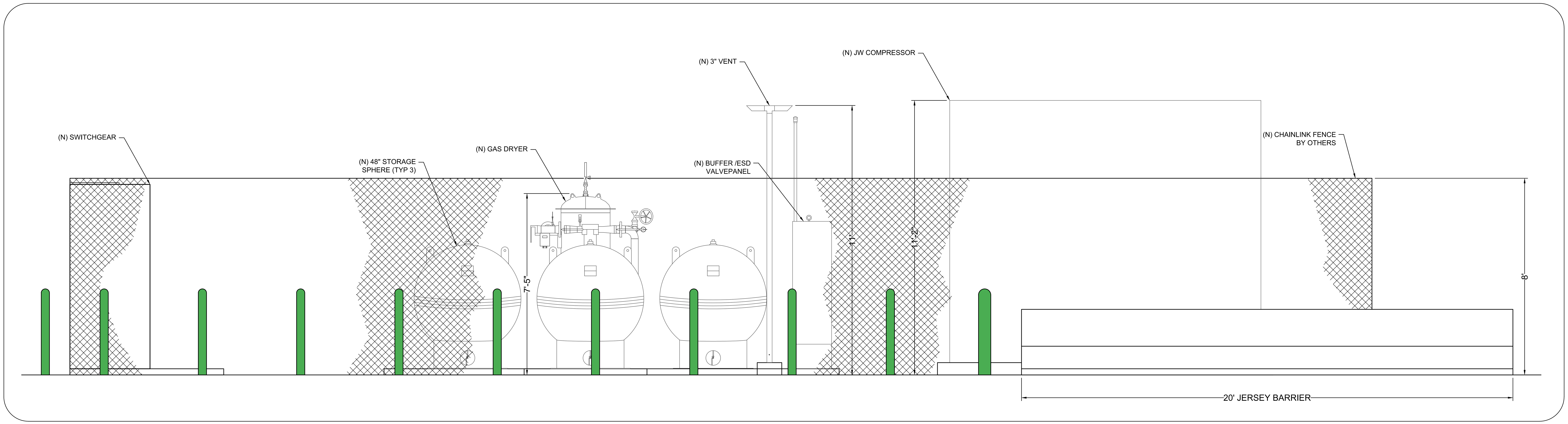


SOUTH ELEVATION 1" = 2'



NORTH ELEVATION 1" = 2'

COLOR CHART

ITEM	COLOR	
CANOPY	WHITE	
BOLLARDS / COVERS	GREEN -PANTONE 361 EC (SEE NOTE 1)	

NOTES

1. COLOR IS TO MATCH PANTONE COLOR SYSTEM OR EQUIVALENT 1101 HIGH GLOSS LAQUER ENAMEL OR EQUIVALENT.
2. CONTRACTOR SHALL PRIME AND PAINT OR PROVIDE GREEN PLASTIC COVERS ON ALL BOLLARDS AND RAILING.
3. CONTRACTOR SHALL PRIME ALL BOLLARDS USING PLASTIC COVERS FOR CORROSION PROTECTION.
4. PERIMETER FENCING SLATS TO MATCH EXISTING COLOR.

3' 1.5' 0' 3' 6'
GRAPHIC SCALE

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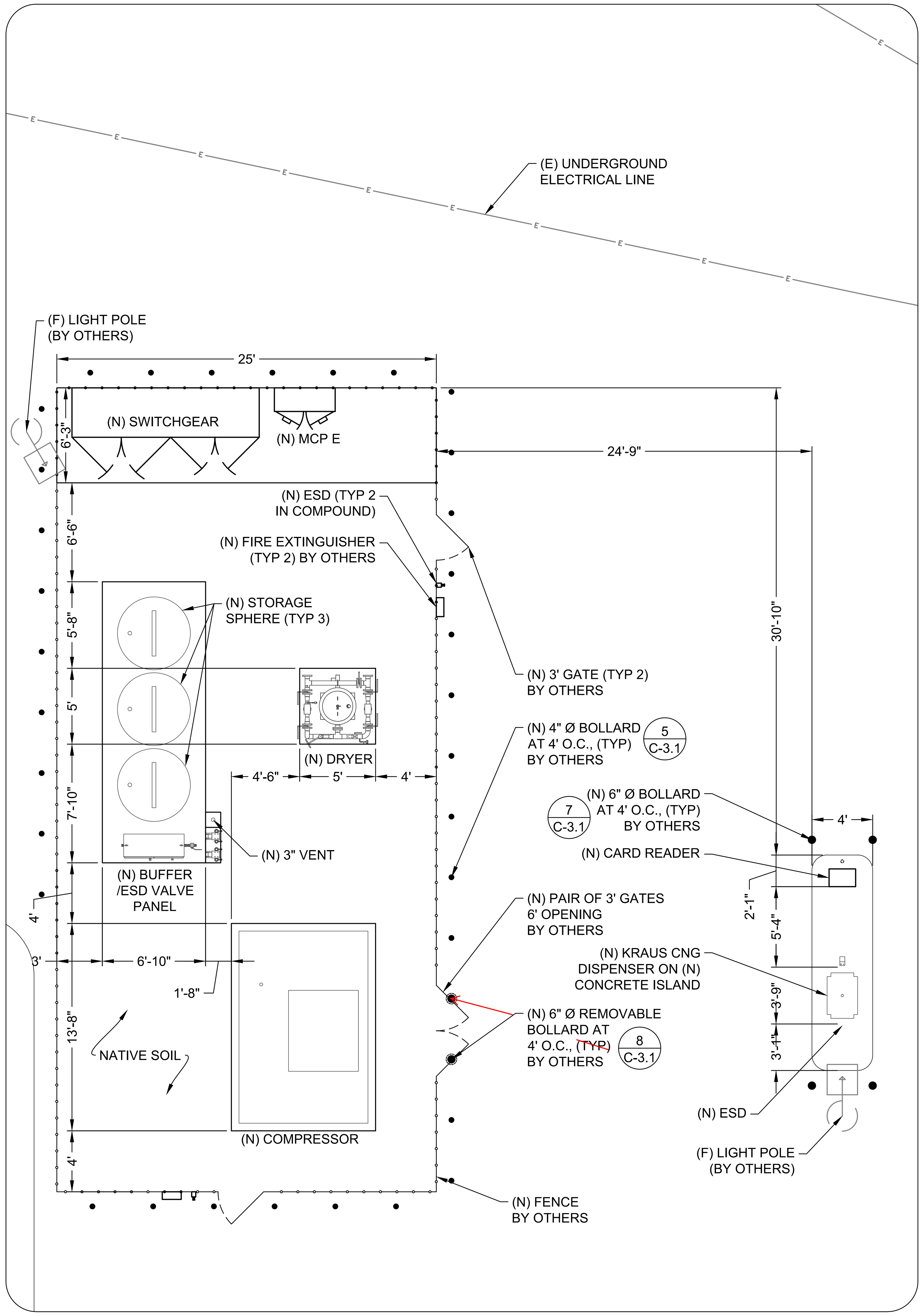
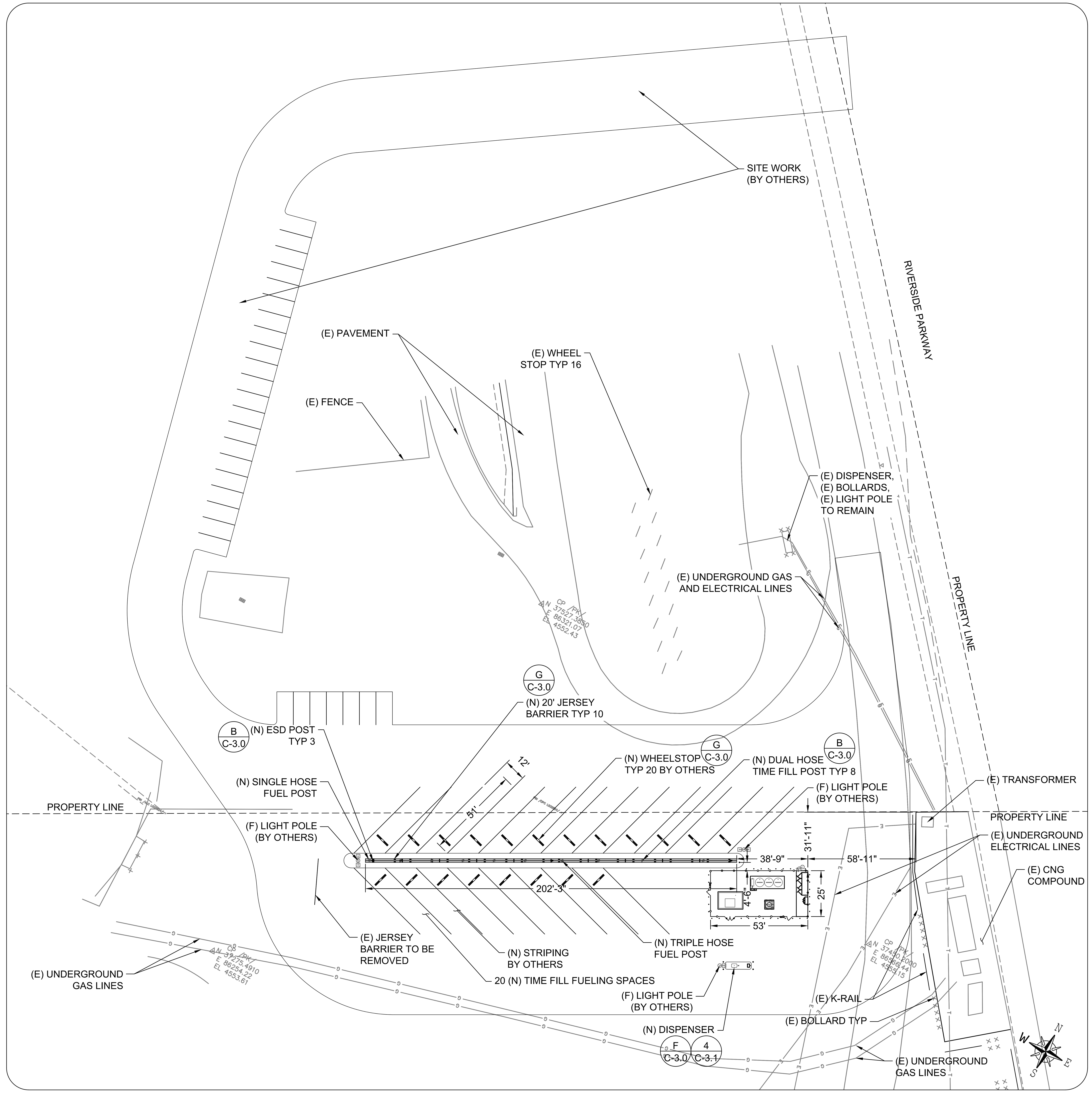


EQUIPMENT COMPOUND LAYOUT (1" = 5')

5' 2.5' 0' 5' 10'

GRAPHIC SCALE



CIVIL SITE PLAN (1"=30')

30' 15' 0' 30' 60'

GRAPHIC SCALE

GENERAL NOTES

1. ALL 3' GATES SHALL BE SPACED TO OPEN FREELY AND MISS ANY BOLLARDS WHEN OPENED
2. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNERS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS TO DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
4. ALL PAVEMENT PAINT SHALL BE SHERWIN WILLIAMS "PROMAR TRAFFIC MARKING", WHITE ON ASPHALT, YELLOW ON CONCRETE. PAINT SHALL BE APPLIED IN TWO (2) COATS TO A CLEAN, DRY SURFACE USING TEMPLATE OR STRIPING MACHINE. STRIPES SHALL BE 4" WIDE UNLESS OTHERWISE NOTED.

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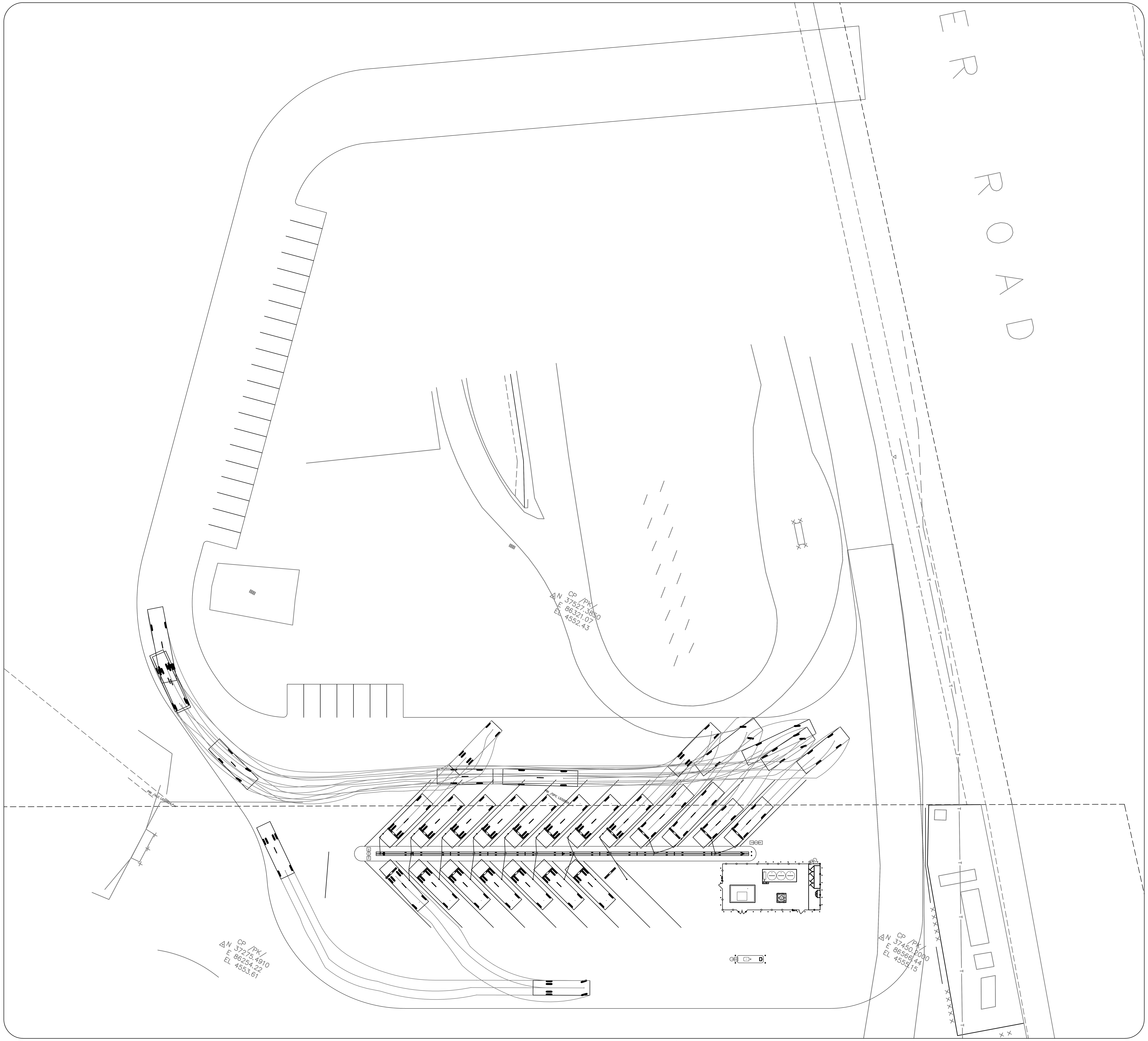

CIRCULATION PLAN (1"=26')

26' 13' 0' 26' 52'

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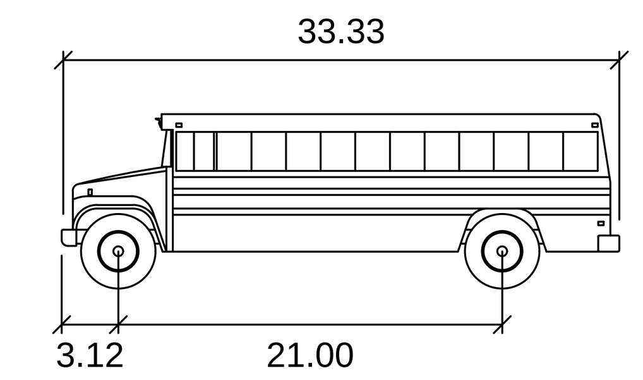
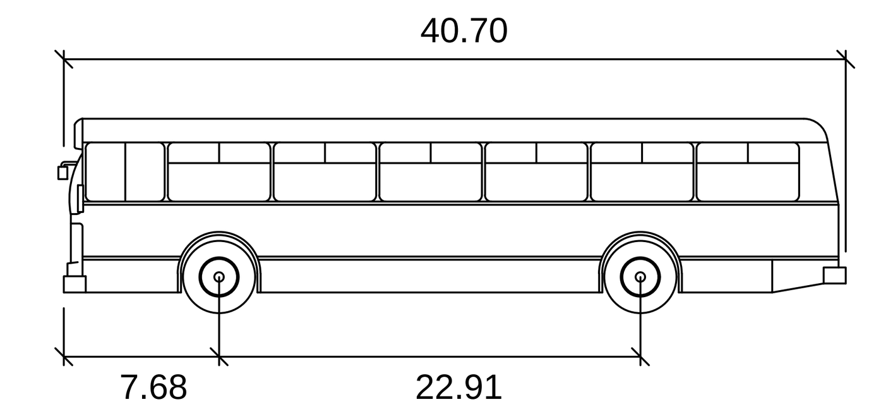


33' Gaval Entourage

		feet
Width	:	8.00
Track	:	8.00
Lock to Lock Time	:	6.0
Steering Angle	:	37.6

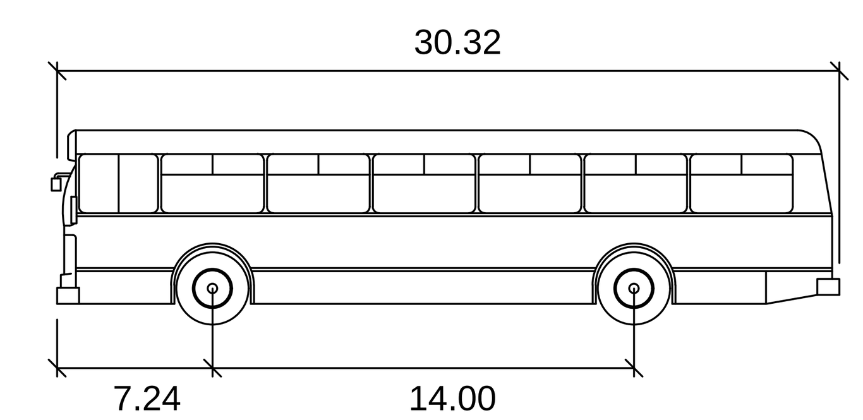
1 – 8



40' Axess

		feet
Width	:	8.50
Track	:	8.50
Lock to Lock Time	:	6.0
Steering Angle	:	34.4

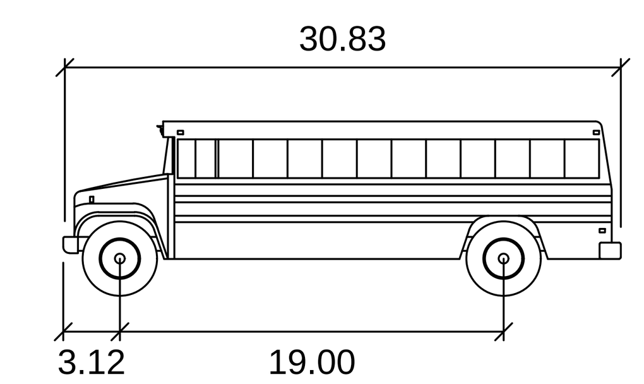
9 – 10



32' EZ Rider II

		feet
Width	:	8.23
Track	:	8.23
Lock to Lock Time	:	6.0
Steering Angle	:	34.4

11 – 12



31' Gaval Entourage

		feet
Width	:	8.00
Track	:	8.00
Lock to Lock Time	:	6.0
Steering Angle	:	37.6

13 – 20

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SHEET: C-1.1

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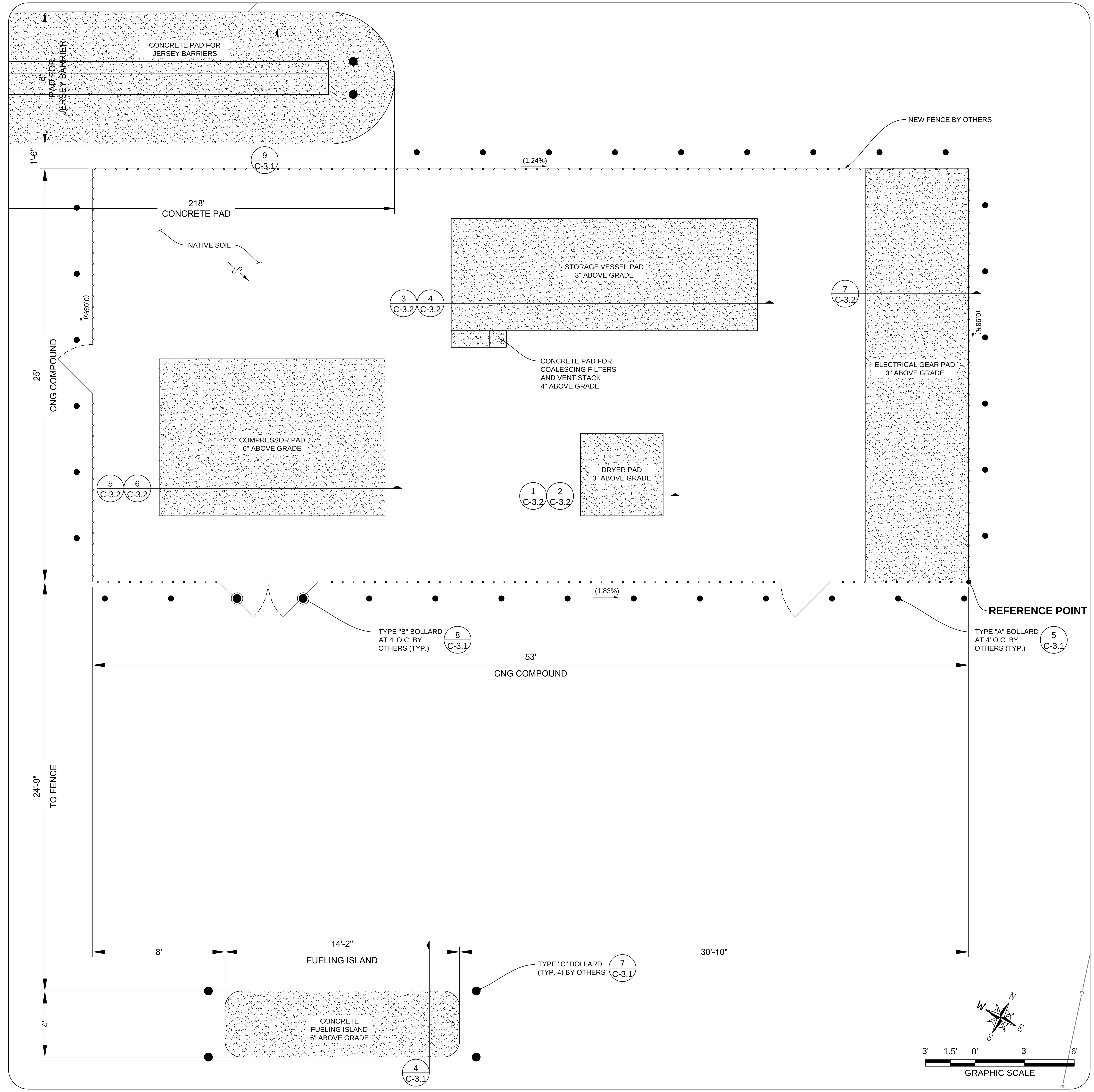
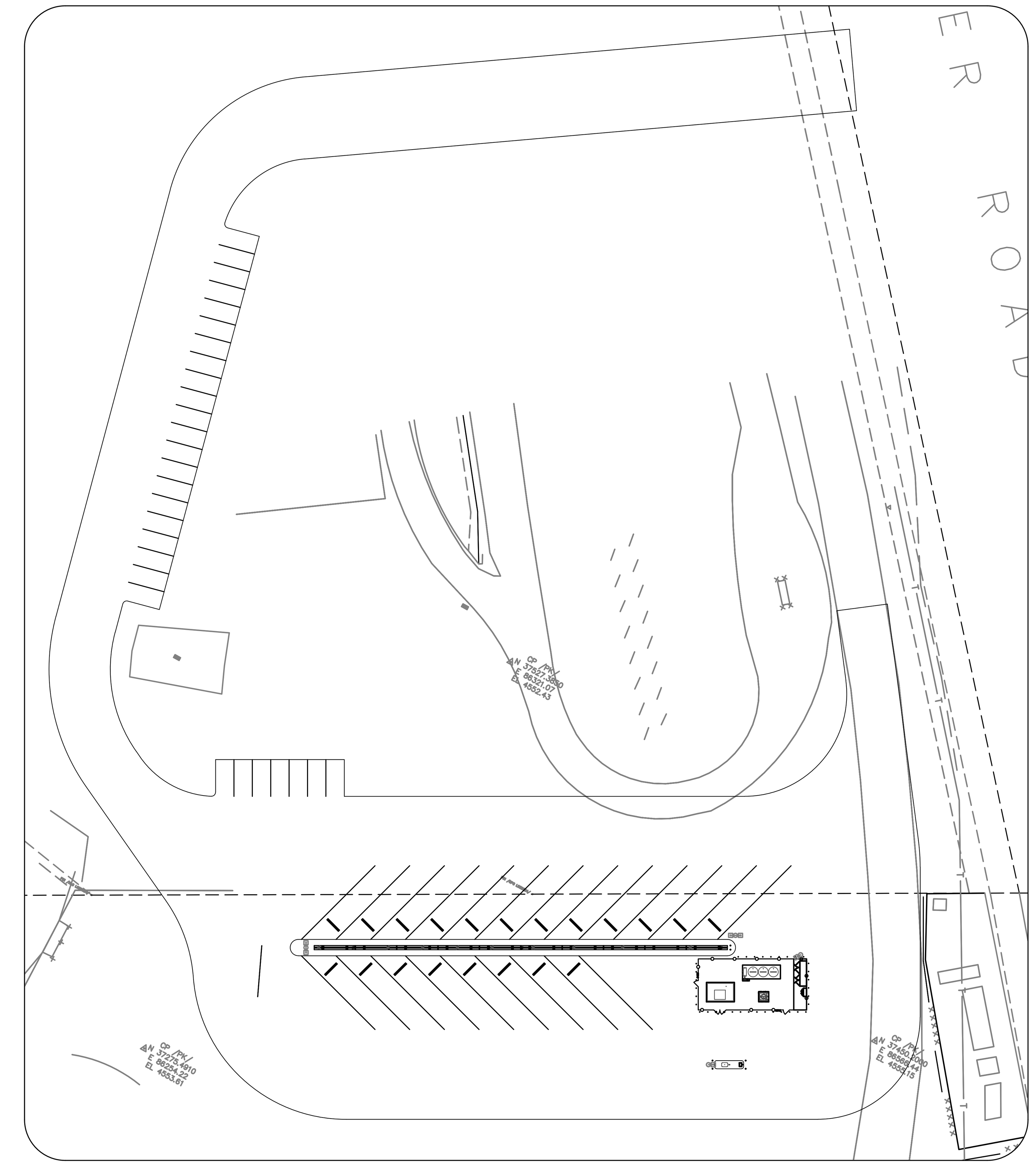


FOUNDATION AND GRADING PLAN (1" = 3')



KEY MAP (1" = 50')

50' 25' 0' 50' 100'

GRAPHIC SCALE

GENERAL NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) AND LOCAL JURISDICTION STORM WATER POLLUTION PREVENTION (SWPP) RULES AND REGULATIONS PRIOR TO THE COMMENCEMENT OF ANY WORK AND DURING ANY CONSTRUCTION ACTIVITIES.
2. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORK.
3. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES HAVING UNDERGROUND UTILITIES ON SITE OR IN RIGHT-OF-WAY PRIOR TO EXCAVATION. CONTRACTOR SHALL CONTACT UTILITY LOCATING COMPANY AND LOCATE ALL UTILITIES PRIOR TO GRADING START.
4. ALL EXISTING STRUCTURES, PAVEMENT, VEGETATION, DEBRIS, STOCKPILED SOIL, TREES AND ASSOCIATED ROOT SYSTEMS, RUBBLE, LOOSE MATERIALS, ETC. WITHIN CONSTRUCTION AREA, SHALL BE REMOVED AND DISPOSED OF OFF SITE UNLESS OTHERWISE NOTED. RESULTING EXCAVATIONS SHALL BE BACKFILLED WITH ENGINEERED FILL.
5. PRIOR TO PLACEMENT OF FILL MATERIAL, ALL UNEVEN SURFACE FEATURES SHALL BE REMOVED. LOOSE MATERIALS SHALL BE MOISTURE CONDITIONED AND COMPACTED TO 90% RELATIVE COMPACTION.
6. ALL PROPOSED SPOT ELEVATIONS ARE SHOWN AT FINISHED SURFACE ELEVATIONS. REFER TO SITE PLAN AND REFERENCED PAVEMENT SECTIONS FOR DEPTHS OF EXCAVATIONS.
7. AFTER COMPLETING THE OVER EXCAVATION AND ANY CORRECTIVE WORK, ALL EXPOSED SUBGRADE SOILS SHALL BE SCARIFIED AND COMPACTED TO A DEPTH OF 8 INCHES . THE MOISTURE CONTENT OF THE SCARIFIED SOIL SHOULD BE ADJUSTED TO AT LEAST ITS OPTIMUM VALUE, AS DETERMINED BY ASTM D1557 (CURRENT EDITION), PRIOR TO BEING COMPACTED TO AT LEAST 90% OF ITS DRY DENSITY.
8. DEPENDING UPON DEPTH OF EXCAVATION AND SEASONAL CONDITIONS GROUNDWATER MAY BE ENCOUNTERED IN EXCAVATION ON THE SITE. PUMPING FROM SUMPS MAY BE UTILIZED TO CONTROL WATER WITHIN EXCAVATIONS. WELL POINTS MAY BE REQUIRED FOR SIGNIFICANT GROUNDWATER FLOW, OR WHERE EXCAVATIONS PENETRATE GROUNDWATER TO A SIGNIFICANT DEPTH.

ABBREVIATIONS

GB	GRADE BREAK
TC	TOP OF CURB
BC	BASE OF CURB
TP	TOP OF PAD
BP	BASE OF PAD
TF	TOP OF FOUNDATION
TG	TOP OF GRATE
EG	EXISTING GRADE
FG	FINISHED GRADE
EP/ EC	EDGE OF PAVEMENT
OHE	OVERHEAD ELEC
PP	POWER POLE

LEGEND

SYMBOL	DESCRIPTION
— — — —14— — — —	EXISTING CONTOUR
———14———	PROPOSED CONTOUR
	PROPOSED DRAINAGE PATTERN
	PROPERTY LINE
	PROPOSED CONCRETE

EXP. DATE: 10/31/2017

COLORADO LICENSED PROFESSIONAL ENGINEER PE 0046745

DATE SIGNED:

GreenbergFarrow
1430 W. PEACHTREE ST. NW SUITE 200
ATLANTA, GA 30309
PHONE: (404) 601-4000
FAX: (404) 601-3970

REV	DATE	REVISIONS	BY
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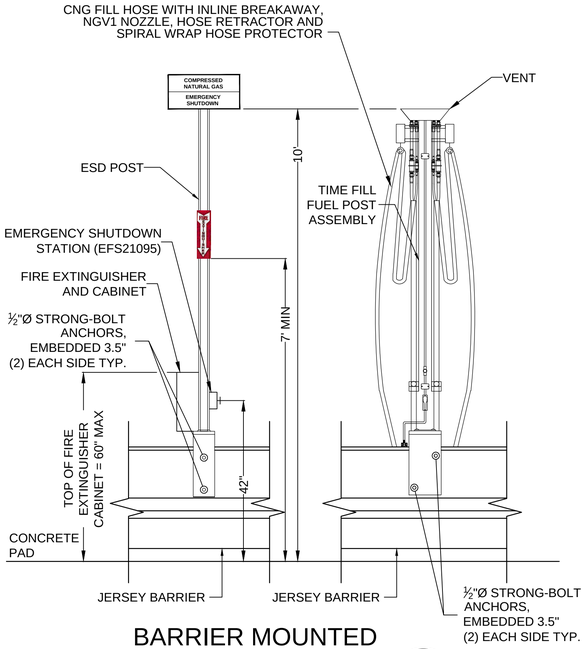
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
FOUNDATION AND GRADING PLAN

ASSET NO: 160-11-17307.02.00

DATE 05/01/2017	DESIGNED BY HVT, CHECKED BY MES, APPROVED BY RLR
SCALE	AS NOTED
SHEET	C-2.0

W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.00)\2.0 Drawings and Engineering\005-C02-FOUNDATION AND GRADING PLAN.dwg - PLOTTED: May 12, 2017 - 1:28pm

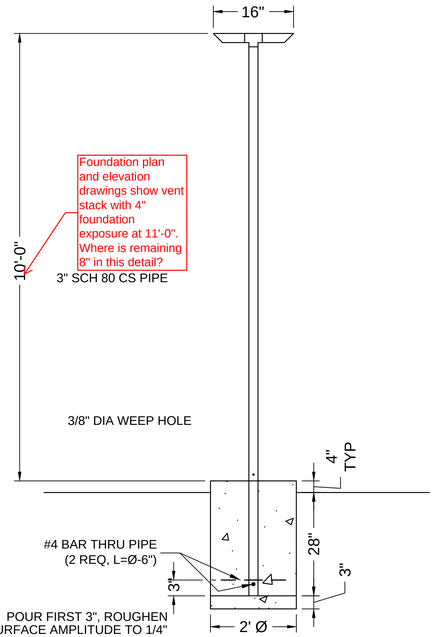


BARRIER MOUNTED ESD & FUEL POSTS

B

N.T.S.

-

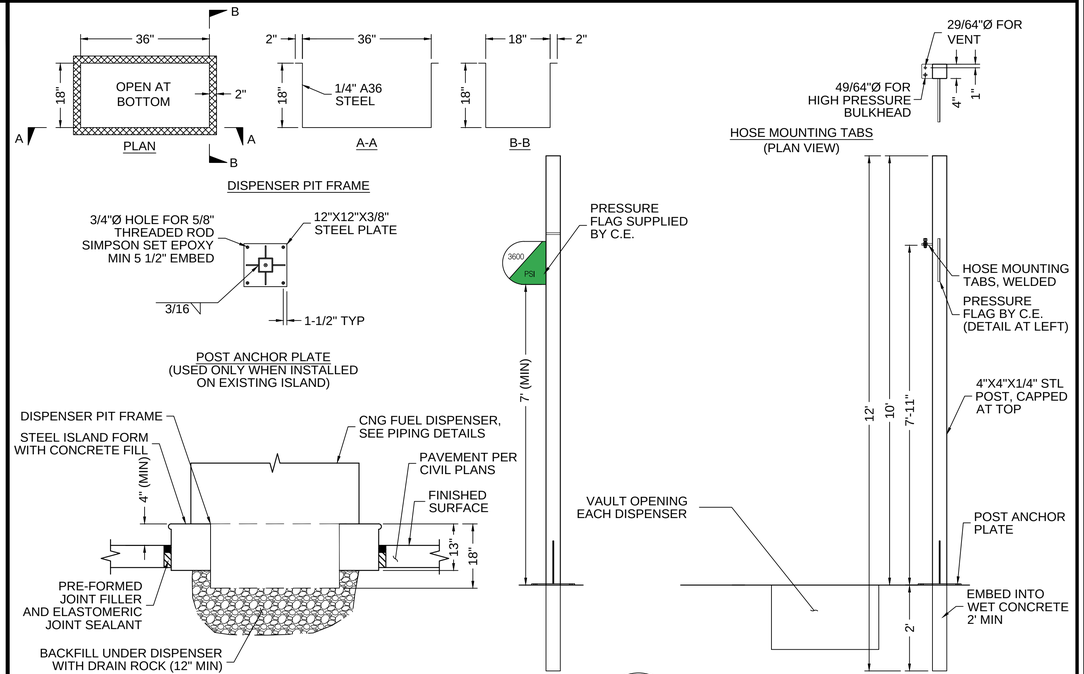


3" VENT STACK

D

N.T.S.

-

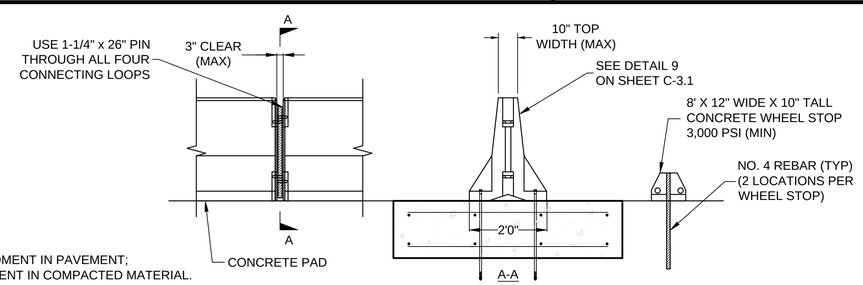


DISPENSER DETAILS

F

N.T.S. (KRAUS ENCORE DISPENSER)

-



NOTES:
1. 2' EMBEDMENT IN PAVEMENT; 3' EMBEDMENT IN COMPACTED MATERIAL.

2. CONTRACTOR SHALL INSTALL WHEEL STOPS IN ORDER TO PROVIDE 2' MINIMUM CLEARANCE FROM JERSEY BARRIER TO ANY VEHICLE.

JERSEY BARRIER AND WHEEL STOP ANCHORAGE

G

N.T.S.

-

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0 1" 2" 3"

1" IN ORIGINAL DRAWING

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SITE DETAILS

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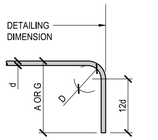
ATLANTA, GA 30309
PHONE: (404) 601-4000
FAX: (404) 601-3970

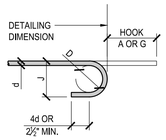
EXP. DATE: 10/31/2017

COLORADO LICENSED
PE 0046745
PROFESSIONAL ENGINEER

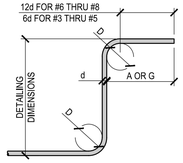
DATE SIGNED:



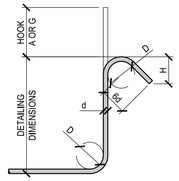
A 90° STANDARD HOOK



B 180° STANDARD HOOK



C 90° STIRRUP/TIE HOOK



D 135° STIRRUP/TIE HOOK

RECOMMENDED END HOOK DIMENSIONS
ALL GRADES OF STEEL; D = FINISHED INSIDE BEND DIAMETER (INCLUDES SPRINGBACK)

BAR SIZE	D, (1N.)	180° HOOKS, (FT.-IN.) A OR G	180° HOOKS, (FT.-IN.) J	90° HOOKS, (FT.-IN.) A OR G
#3	2½	0-5	0-3	0-6
#4	3	0-6	0-4	0-8
#5	3¾	0-7	0-5	0-10
#6	4½	0-8	0-6	1-0
#7	5¼	0-10	0-7	1-2
#8	6	0-11	0-8	1-4

RECOMMENDED STIRRUP/TIE HOOK DIMENSIONS
ALL GRADES OF STEEL; D = FINISHED INSIDE BEND DIAMETER

BAR SIZE	D, (1N.)	90° HOOKS, (FT.-IN.) A OR G	180° HOOKS, (FT.-IN.) A OR G	180° HOOKS, (FT.-IN.) H (APPROX.)
#3	1½	0-4	0-4	0-2½
#4	2	0-4½	0-4½	0-3
#5	2½	0-6	0-5½	0-3¾
#6	4½	1-0	0-8	0-4½
#7	5¼	1-2	0-9	0-5¼
#8	6	1-4	0-10½	0-6

NOTES:
1. ALL BAR BENDS SHALL BE MADE COLD.
2. #14 AND #18 BARS SHALL BE BEND TESTED AND LAB APPROVED PRIOR TO BENDING.

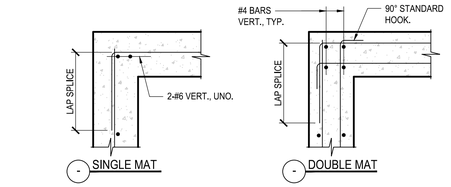
1 CONCRETE REINFORCING BAR BENDS
NTS

LAP SPLICE TABLE, ℓ

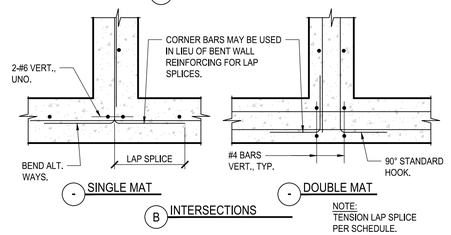
BAR SIZE	LAP CLASS	f'c=2500 PSI CASE 1	f'c=2500 PSI CASE 2	f'c=3000 PSI CASE 1	f'c=3000 PSI CASE 2	f'c=4000 PSI CASE 1	f'c=4000 PSI CASE 2	f'c=4500 PSI CASE 1	f'c=4500 PSI CASE 2
#3	A	18"	27"	18"	25"	15"	22"	14"	21"
	B	24"	36"	22"	33"	19"	29"	18"	27"
#4	A	24"	36"	22"	33"	19"	29"	18"	27"
	B	32"	48"	29"	43"	25"	38"	24"	36"
#5	A	30"	45"	28"	42"	24"	36"	23"	34"
	B	40"	60"	37"	54"	32"	47"	30"	45"
#6	A	36"	54"	33"	50"	29"	43"	27"	41"
	B	48"	72"	44"	65"	38"	57"	36"	54"

NOTES:
1. TOP BARS ARE NOT INDICATED IN THIS TABLE. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW THE BAR. FOR TOP BAR USE 1.3ℓ.
2. CLASS A - HALF OR LESS OF THE BARS ARE SPLICED WITHIN A REQUIRED LAP LENGTH. CLASS B - MORE THAN HALF OF THE BARS ARE SPLICED WITHIN A REQUIRED LAP LENGTH.
3. CASES 1 AND 2 ARE DEFINED AS FOLLOWS:
   CASE 1: ALIGN CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN db, CLEAR COVER NOT LESS THAN db, AND STIRRUPS OR TIES THROUGHOUT ℓd NOT LESS THAN THE CODE MINIMUM, OR CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2db AND CLEAR COVER NOT LESS THAN db.
   CASE 2: OTHER CASES.

2 TYPICAL CONCRETE DEVELOPMENT AND LAP SPLICE REINFORCEMENT



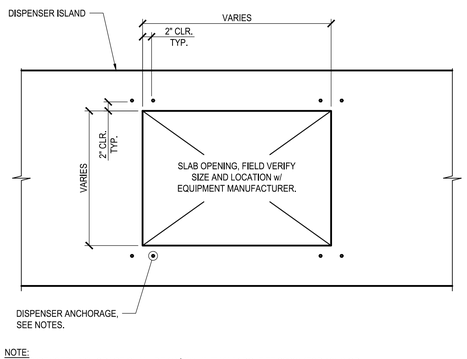
A CORNERS



B INTERSECTIONS

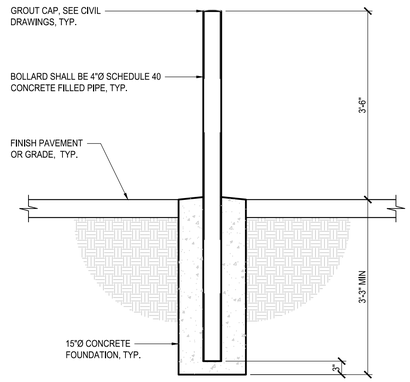
NOTE:
TENSION LAP SPLICE PER SCHEDULE.

3 CONCRETE INTERSECTIONS
3/4"=1'-0"

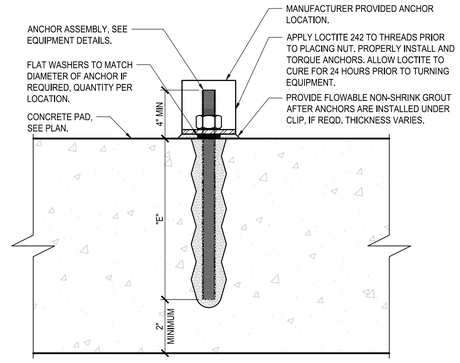


NOTE:
1. DISPENSER ANCHORAGE SHALL BE (4) ⅜"Ø HILTI KWIK BOLT TZ SS304 (ESR 1917) OR GALVANIZED ROD w/ HILTI HIT-RE 500-SD EOPXY (ESR 2322) w/ 2½" MIN EMBEDMENT.
2. SEE "TYPICAL EQUIPMENT ANCHORAGE DETAIL" FOR BALANCE OF INFORMATION.
3. INSTALLATION TORQUE = 25 FT LBS FOR HILTI KWIK BILT TZ

4 TYPICAL DISPENSER ISLAND ANCHORAGE
3/4" = 1'-0"



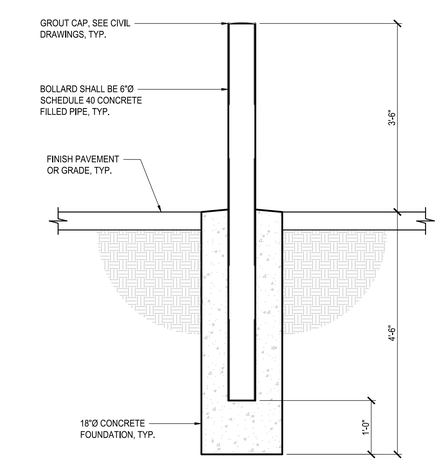
5 BOLLARD TYPE A - TYPICAL
3/4" = 1'-0"



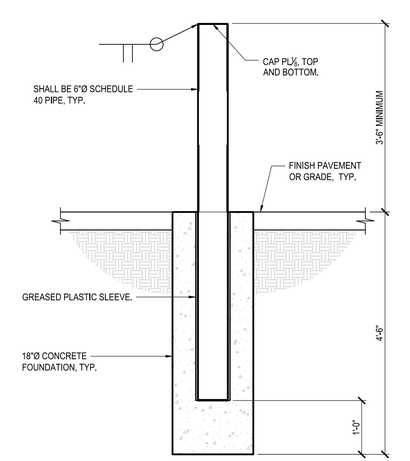
NOTES:
1. ANCHORAGE FOR EQUIPMENT TO BE INSTALLED IN MANUFACTURER'S PROVIDED LOCATIONS.
2. NUMBER OF ANCHORS PROVIDED IN THE EQUIPMENT DETAILS ARE THE MINIMUM REQUIRED TO RESIST ENVIRONMENTAL LOADS. ALL ANCHORAGE LOCATIONS PROVIDED BY MANUFACTURER TO BE ANCHORED PER THIS DETAIL, UNO.
3. CONTRACTOR TO VERIFY MAT REINFORCING PRIOR TO DRILLING HOLES. DO NOT DAMAGE MAT REINFORCING.

INSTALLATION SEQUENCE NOTES:
1. SET UNIT.
2. DRILL AND CLEAN ALL HOLES.
3. SHIM UNDER CLIP WITH WASHERS.
4. INSTALL ANCHORS PER PUBLISHED ICC REPORT AND TORQUE BOLTS.
5. GROUT.

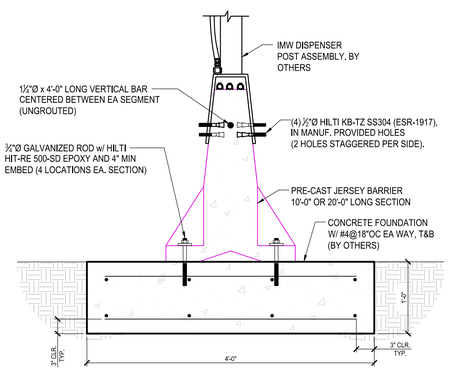
6 TYPICAL EQUIPMENT ANCHORAGE DETAIL
3"=1'-0"



7 BOLLARD TYPE C - DISPENSERS
3/4" = 1'-0"



8 BOLLARD TYPE B - REMOVABLE
3/4" = 1'-0"



9 FILL / ESD POST ANCHORAGE TO JERSEY BARRIER

GreenbergFarrow
1430 W. PEACHTREE ST. NW SUITE 200
ATLANTA, GA 30309
PHONE: (404) 601-4000
FAX: (404) 601-3970

EXP. DATE: 10/31/2017
COLORADO LICENSED
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PROFESSIONAL ENGINEER
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SITE DETAILS

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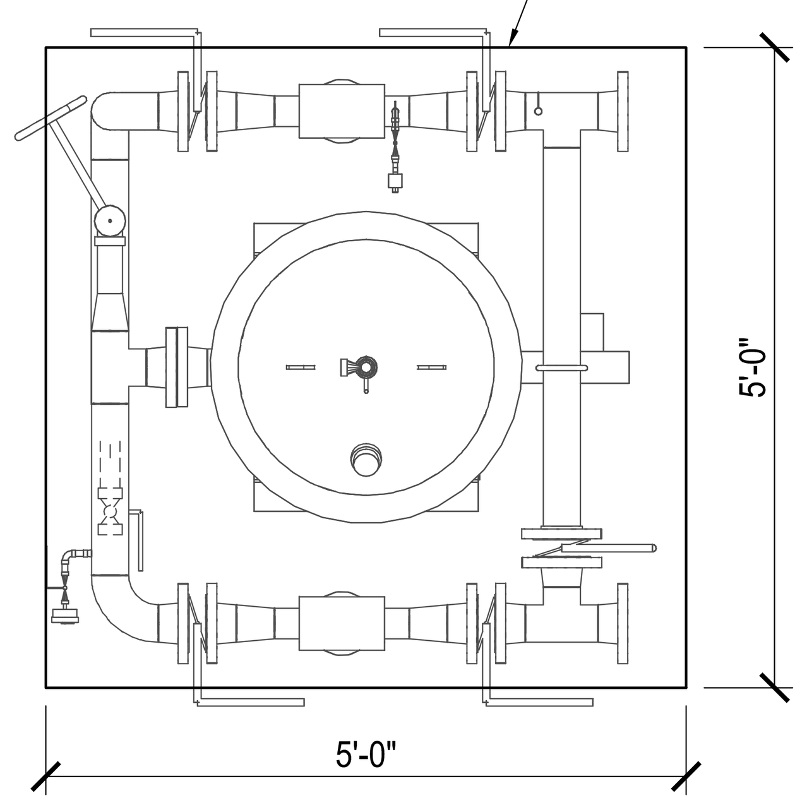
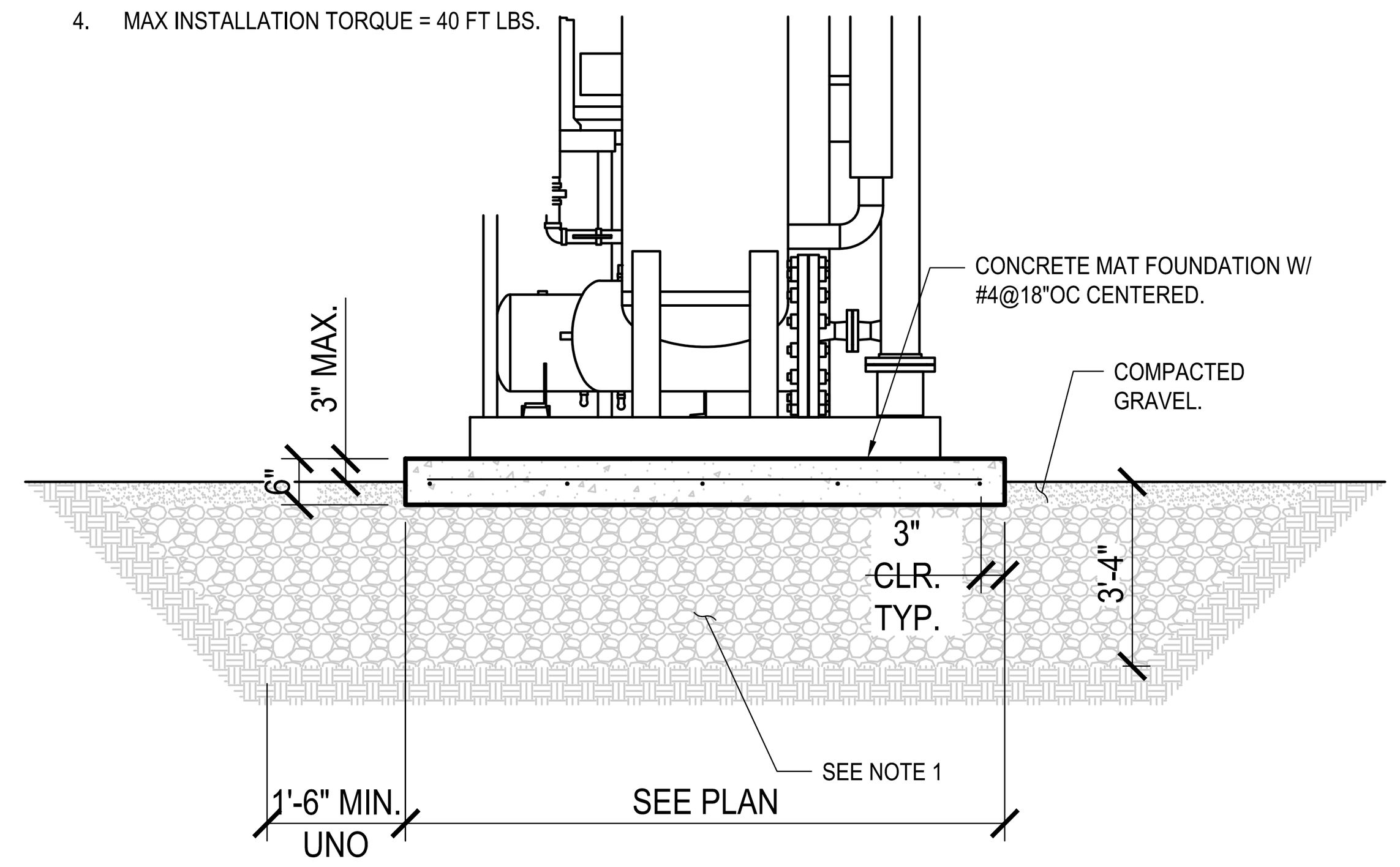


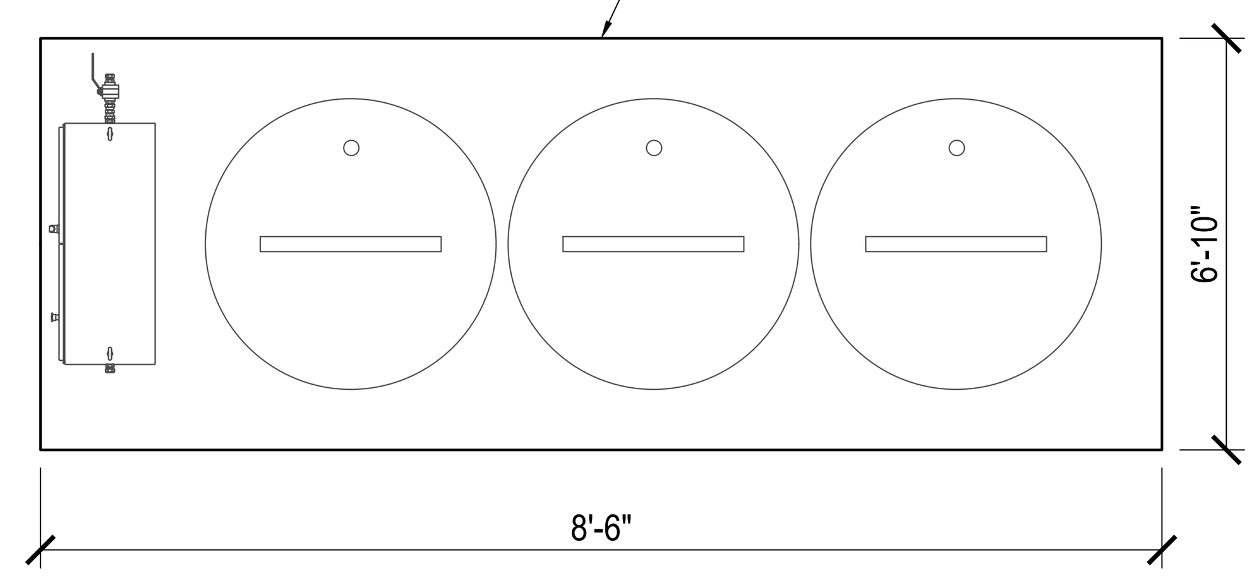
1 DRYER PAD PLAN - PSB 21-4
NTS

NOTES:
1. STRUCTURAL BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557. FILL SHALL BE COMPACTED IN MAXIMUM 8" LIFTS OR AS REQUIRED PER THE GEOTECHNICAL REPORT.
2. DRYER ANCHORAGE SHALL BE (4) ⅝" Ø GALVANIZED RODS w/ HILTI HIT-RE 500-SD EPOXY (ESR 2322) w/ 3" MIN EMBEDMENT.
3. SEE "TYPICAL EQUIPMENT ANCHORAGE DETAIL" FOR BALANCE OF INFORMATION.
4. MAX INSTALLATION TORQUE = 40 FT LBS.

does this fill need to be frost resistant like under spheres?

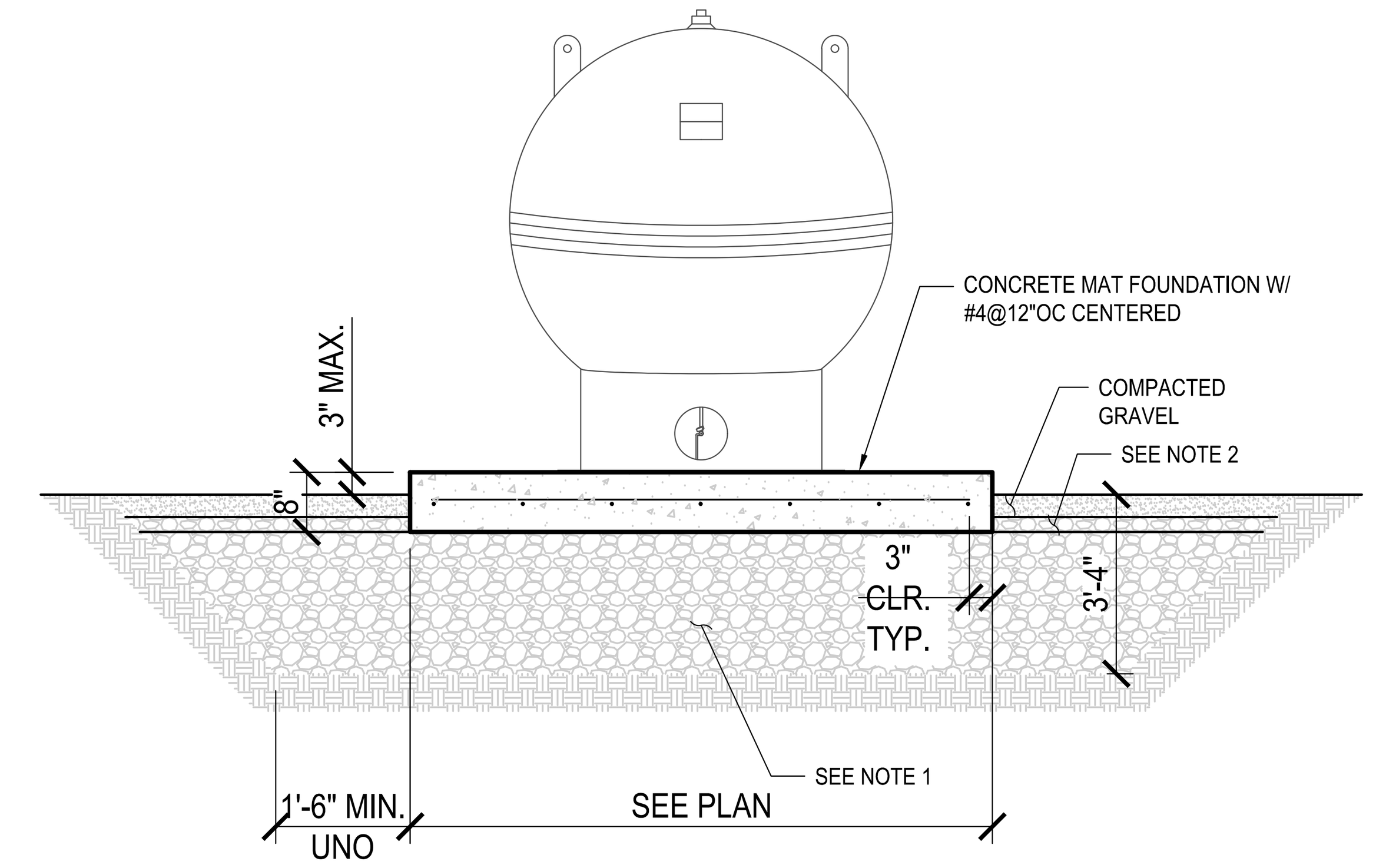


2 DRYER PAD SECTION



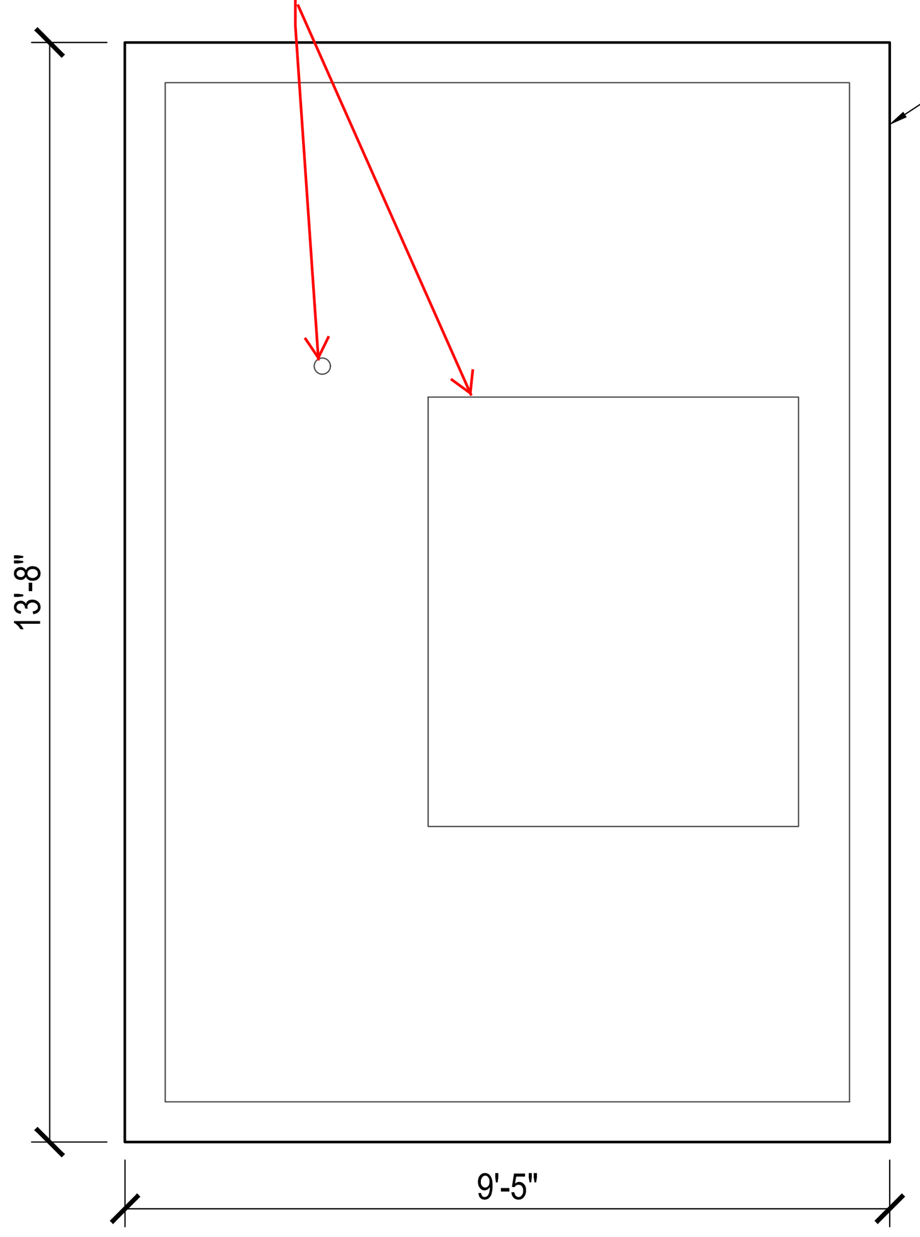
3 STORAGE SPHERE PAD PLAN
NTS

NOTES:
1. STRUCTURAL FROST-RESISTANT BACKFILL STRUCTURAL FROST-RESISTANT BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557. FILL SHALL BE COMPACTED IN MAXIMUM 8" LIFTS.

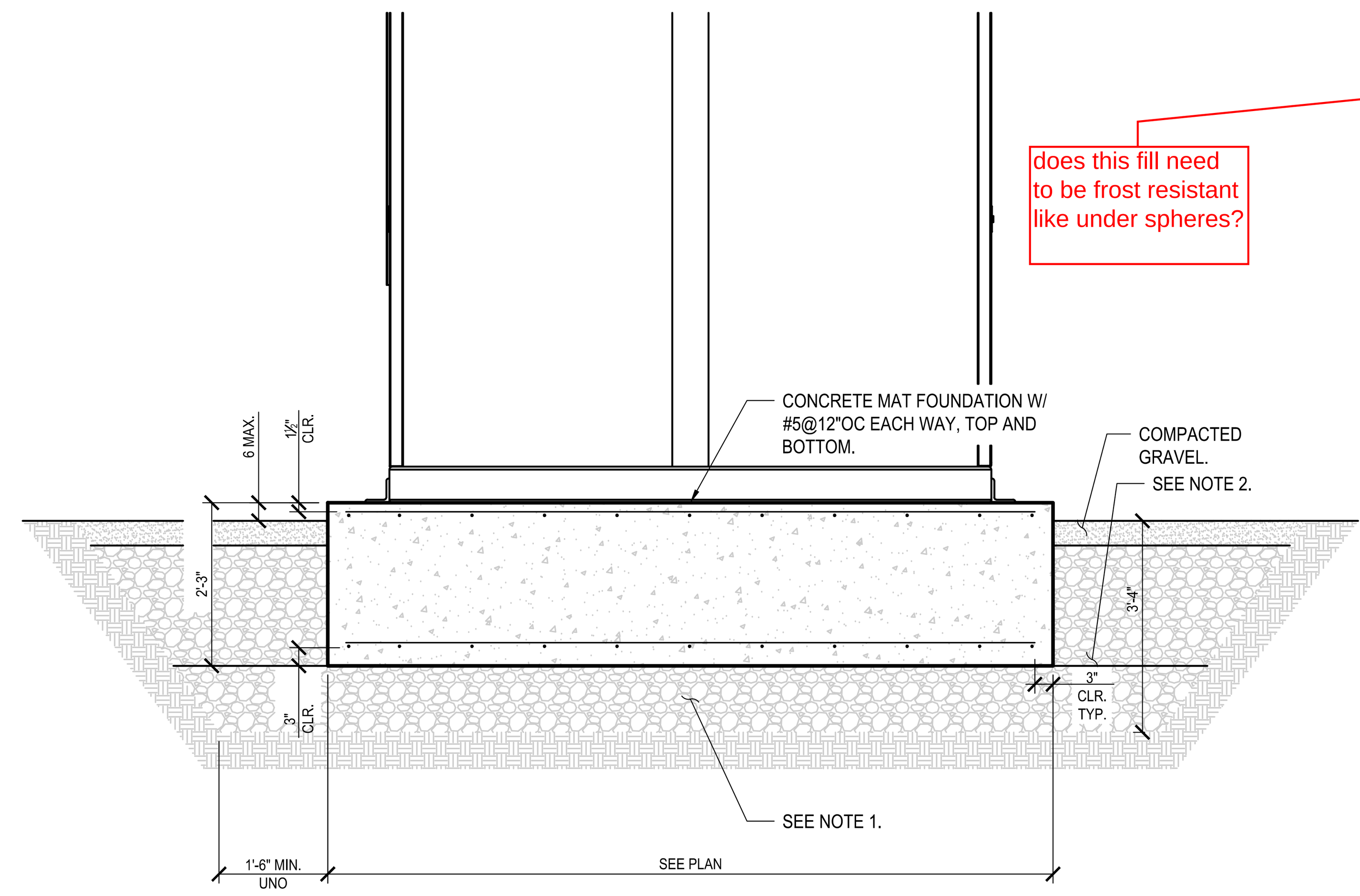


4 STORAGE SPHERE PAD SECTION
1/2" = 1'-0"

What is this? Please anotate.



5 IMW SINGLE COMPRESSOR PAD PLAN
NTS



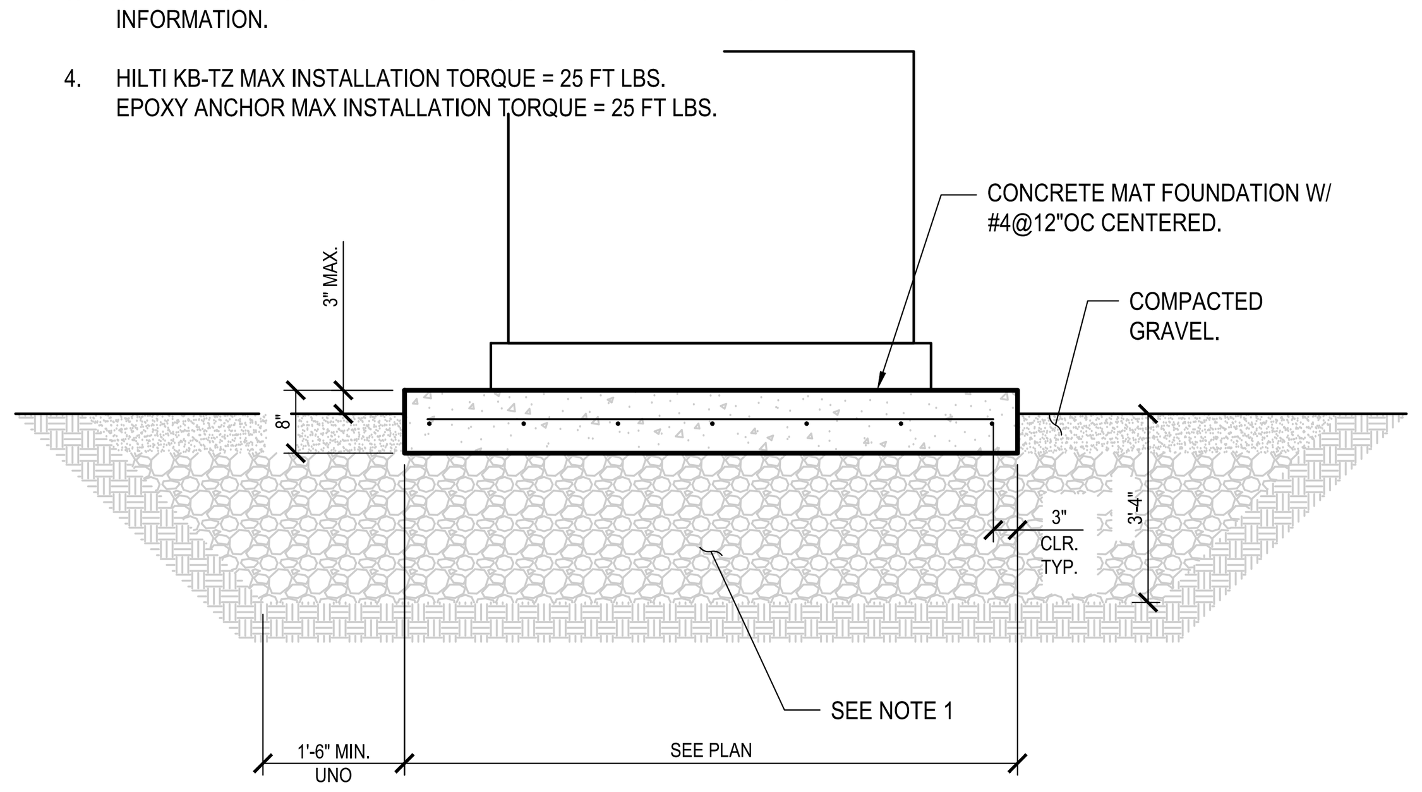
does this fill need to be frost resistant like under spheres?

NOTES:
1. STRUCTURAL BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557. FILL SHALL BE COMPACTED IN MAXIMUM 8" LIFTS OR AS REQUIRED PER THE GEOTECHNICAL REPORT.
2. STRUCTURAL BACKFILL COMPACTED TO 90% MAXIMUM DRY DENSITY PER ASTM D1557. FILL SHALL BE COMPACTED IN MAXIMUM 8" LIFTS OR AS REQUIRED PER THE GEOTECHNICAL REPORT, TYP. AT SIDES OF MAT FOUNDATION.
3. COMPRESSOR ANCHORAGE SHALL BE AS FOLLOWS:
   - (16) ⅝"Ø GALVANIZED RODS w/ HILTI HIT-RE 500-SD EPOXY (ESR 2322) w/ 6" MIN EMBEDMENT AT SKID PAD.
4. SEE "TYPICAL EQUIPMENT ANCHORAGE DETAIL" FOR BALANCE OF INFORMATION.
5. MAX INSTALLATION TORQUE = 100 FT LBS.
6. SOIL SUBGRADE MODULUS k=150psi

6 COMPRESSOR PAD SECTION

NOTES:
1. STRUCTURAL BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557. FILL SHALL BE COMPACTED IN MAXIMUM 8" LIFTS OR AS REQUIRED PER THE GEOTECHNICAL REPORT.
2. ELECTRICAL EQUIPMENT ANCHORAGE SHALL BE ⅜" Ø HILTI KWIK-BOLT TZ SS304 (ESR 1917) OR ⅜"Ø GALVANIZED ROD w/ HILTI HIT-RE 500-SD EPOXY (ESR 2322) w/ 2½" MIN EMBED. ANCHORS SHALL BE LOCATED IN ALL MANUFACTURER PROVIDED LOCATIONS.
3. SEE "TYPICAL EQUIPMENT ANCHORAGE DETAIL" FOR BALANCE OF INFORMATION.
4. HILTI KB-TZ MAX INSTALLATION TORQUE = 25 FT LBS. EPOXY ANCHOR MAX INSTALLATION TORQUE = 25 FT LBS.

does this fill need to be frost resistant like under spheres?



7 ELECTRICAL EQUIPMENT PAD SECTION

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ATLANTA, GA 30309
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FAX: (404) 601-3970

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CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
SITE DETAILS

ASSET NO: 160-11-17307.02.00

W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.00)\2.0 Drawings and Engineering\006-C04-STRUC SITE DETAILS.dwg - PLOTTED: May 12, 2017 - 1:28pm

DATE	DESIGNED BY	HVT
05/01/2017	CHECKED BY	MES
	APPROVED BY	RLR
SCALE	AS NOTED	
SHEET	C-3.2	

PART 3- PIPING AND EQUIPMENT INSTALLATION

3.1 GENERAL

A. THIS SECTION OF THE SPECIFICATIONS, TOGETHER WITH ANY SPECIAL CONDITIONS AND THE CONSTRUCTION DRAWINGS, COVER THE WORK OF FABRICATING, INSTALLING, AND TESTING THE PIPING SYSTEMS REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR UNDERSTANDING THE INTENT OF THE CONSTRUCTION DRAWINGS AND PROVIDING A COMPLETE WORKING SYSTEM. ANY OMISSIONS OR DISCREPANCIES AMONG THE DRAWINGS, SPECIFICATIONS, AND OTHER CONTRACT PROVISIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.

B. PIPING SYSTEMS COVERED BY THESE SPECIFICATIONS INCLUDE ALL UNDERGROUND AND ABOVEGROUND PIPING, INCLUDING VENTS AND ALL STAINLESS STEEL PRESSURE TUBING.

C. CONSTRUCTION AND INSTALLATION SHALL CONFORM TO THE FOLLOWING CODES AND STANDARDS AS ADOPTED OR AMENDED BY THE AUTHORITIES HAVING JURISDICTION.

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)
B31.3 - PROCESS PIPING
B16.5 - STEEL PIPE FITTING AND FLANGES
ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
OHSA (OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION)
INTERNATIONAL FUEL GAS CODE
INTERNATIONAL FIRE CODE
NFPA (NATIONAL FIRE PROTECTION ASSOCIATION) 52 - VEHICULAR GASEOUS FUEL SYSTEMS CODE

D. THE CONTRACTOR SHALL INSPECT THE SITE FOR, AND VERIFY THE LOCATIONS OF ANY EXISTING SUBSTRUCTURES AND UNDERGROUND UTILITIES, AND SHALL NOT RELY ON THESE PLANS OR DRAWINGS ALONE. THE CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO PROTECT EXISTING UNDERGROUND UTILITIES AND SUBSTRUCTURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION, IRRESPECTIVE OF WHETHER OR NOT THE DAMAGED UTILITY WAS SHOWN ON THE DRAWINGS.

E. THE CONTRACTOR SHALL NOTIFY CLEAN ENERGY OF ANY DAMAGE TO ANY EXISTING UNDERGROUND WET OR DRY UTILITIES, OR TO ANY CONDUITS DAMAGED DURING TRENCHING, AND SHALL REPAIR THEM IMMEDIATELY ACCORDING TO THE STANDARDS OF THE AGENCY and Owner DICTION OVER THEM.

3.2 PIPING DESIGN CONDITIONS

A. THIS CNG FUELING STATION HAS BEEN DESIGNED FOR THE FOLLOWING PRESSURE AND TEMPERATURE CONDITIONS:

OPERATING PRESSURE:	4,500 PSIG
DESIGN PRESSURE:	5,000 PSIG
DESIGN TEMPERATURE:	-20°F TO 130°F
PNEUMATIC TEST PRESSURE:	5,500 PSIG (FOR CNG PIPING)

3.3 ACCEPTABLE PRODUCT MANUFACTURING LOCATIONS

A. GAS PIPING MATERIALS (PIPE, STAINLESS STEEL TUBE, GAS VALVES, FITTINGS AND INSTRUMENTATION) SHALL BE MANUFACTURED IN ANY OF THE FOLLOWING REGIONS: NORTH AMERICA, THE EUROPEAN UNION, SOUTH KOREA, JAPAN, AND REPUBLIC OF CHINA (TAIWAN).

B. GAS PIPING MATERIALS MANUFACTURED IN ANY REGION OUTSIDE THOSE LISTED ABOVE SHALL NOT BE USED OR INSTALLED.

3.4 PIPE SPECIFICATIONS

A. ALL UNDERGROUND CARBON STEEL PIPE SHALL BE PROPERLY CLEANED AND EPOXY-COATED PRIOR TO BURIAL, ELECTRICALLY INSULATED FROM ABOVEGROUND PIPING OR STRUCTURES, AND CATHODICALLY PROTECTED IN ACCORDANCE WITH THIS SPECIFICATION AND CURRENT INDUSTRY STANDARDS.

B. ALL CARBON STEEL PIPE MATERIAL CONVEYING NATURAL GAS SHALL BE SEAMLESS ASTM A106, GRADE B MATERIAL. PIPE FITTINGS SHALL BE USED AS FOLLOWS.

1. SCHEDULE 40 PIPE SHALL BE JOINED USING WROUGHT STEEL SCHEDULE 40 ASTM A234 GR. WPB BUTT WELDING FITTINGS. FLANGED FITTINGS FOR SCHEDULE 40 PIPE SHALL BE RAISED-FACE WELDNECK-TYPE, ANSI B16.5, EITHER CLASS 150 OR CLASS 300, PER THE DRAWINGS, USING ASTM A105 FORGED CARBON STEEL.

2. SCHEDULE 80 PIPE SHALL BE JOINED USING WROUGHT STEEL SCHEDULE 80 ASTM A234 BUTT WELDING FITTINGS. FLANGED FITTINGS FOR SCHEDULE 80 PIPE SHALL BE RAISED-FACE WELDNECK-TYPE, ANSI B16.5, EITHER CLASS 300 OR CLASS 600, PER THE DRAWINGS, USING ASTM A105 FORGED CARBON STEEL.

3.4 STAINLESS STEEL TUBING

A. STAINLESS STEEL PRESSURE TUBING SHALL BE SEAMLESS, BRIGHT-ANNEALED TUBE FOR GENERAL SERVICE, MANUFACTURED AND TESTED ACCORDING TO ASTM A269, USING MATERIAL DUAL-CERTIFIED AS TYPE TP316 AND TP316L. TUBE SHALL BE COLD-FINISHED AND FREE OF SCRATCHES. UPON REQUEST, THE TUBE SUPPLIER SHALL FURNISH MILL CERTIFICATES DOCUMENTING COMPLIANCE WITH THIS SPECIFICATION.

B. ALL BENDS SHALL BE MADE USING TUBING BENDERS, EXCEPT WHEN TUBE IS PULLED UNDERGROUND THROUGH A SLEEVE. BEND ANGLE SHOULD BE 90° WHENEVER POSSIBLE. TUBING SHALL BE ROUTED PARALLEL WITH THE VERTICAL AND HORIZONTAL AXES OF THE EQUIPMENT. UNDERGROUND TUBING SHALL BE CONTINUOUS OR WELDED, AND ROUTED COMPLETELY WITHIN A WATERTIGHT PVC, HDPE OR ENT SLEEVE. AT NO TIME SHALL MECHANICAL FITTINGS BE PLACED UNDERGROUND.

C. ALL ABOVEGROUND TUBING SHALL BE FABRICATED USING STRAIGHT STICKS, AND ANCHORED PER CODE TO PREVENT BENDING OR EXCESSIVE VIBRATION. SUITABLE RESILIENT ANCHORS, SUCH AS PARKER PARKLAMP OR UNISTRUT KUSH-A-CLAMP, SHALL BE USED.

D. REQUIRED TUBE WALL THICKNESS FOR CNG SERVICE (INCHES):

OUTSIDE DIA. [IN.]	WALL THICKNESS [IN.]	BASIS
1/4	0.049	AVG WALL THK.
3/8	0.065	AVG WALL THK.
1/2	0.083	AVG WALL THK.
5/8	0.095	AVG WALL THK.
3/4	0.109	AVG WALL THK.
1	0.120	MIN. WALL THK.

E. TUBE FITTINGS SHALL BE TYPE 316 STAINLESS STEEL, WITH A MAWP OF NOT LESS THAN 5,500 PSIG. ACCEPTABLE PRODUCTS ARE LISTED BELOW. NO OTHER PRODUCTS MAY BE USED WITHOUT PRIOR APPROVAL BY THE ENGINEER. ALL SWAGED FITTINGS FURNISHED BY THE THE CONTRACTOR SHALL BE INTERCHANGEABLE PRODUCTS OF A SINGLE MANUFACTURER.

1. SWAGELOK
2. HOKE "GYROLOK"

F. BALL VALVES: HIGH PERFORMANCE, PARKER, SWAGELOK, SVF OR HOKE, 316 STAINLESS STEEL BODY AND TRIM, SUITABLE FOR COMPRESSED NATURAL GAS SERVICE.

G. NEEDLE VALVES: SWAGELOK OR HOKE, 316 STAINLESS STEEL BODY AND TRIM, SUITABLE FOR COMPRESSED NATURAL GAS SERVICE, 5500 PSI, OR APPROVED EQUAL.

H. SLEEVE (FOR BURIED TUBING): PVC CONDUIT, FLEXIBLE ENT CONDUIT, OR PEP (POLYETHYLENE) PIPE. SIZED AS SHOWN ON THE DRAWINGS.

3.5 POLYETHYLENE (PEP) PIPE: DR 7, 9, OR 11

A. POLYETHYLENE PIPE TO BE DESIGNED IN ACCORDANCE WITH PPI HANDBOOK OF PE PIPE, 2 ND EDITION, RATED FOR NOT LESS THAN THE MAXIMUM PRESSURE OF THE SUPPLY SYSTEM, AND NOT USED WITH PRESSURES GREATER THAN 150PSIG.

B. PEP SHALL BE WARRANTED FOR NATURAL GAS DISTRIBUTION AND MANUFACTURED ACCORDING TO PPI DESIGNATION PE 4710 AND ASTM D 2513; CP CHEM YELLOW STRIPE 8300 OR APPROVED EQUAL. PEP SHALL BE JOINED USING BUTT FUSION IN COMPLIANCE WITH PIPE MANUFACTURER'S INSTALLATION MANUAL.

C. A COATED COPPER CLAD STEEL TRACER WIRE (#12 GAUGE OR LARGER) SHALL BE INSTALLED WITH ALL BURIED PEP. TRACER WIRE TO BE LAID WITHIN 6" DIRECTLY ABOVE THE PEP WHERE PRACTICAL. WRAPPING OF THE TRACER WIRE AROUND PEP IS PROHIBITED.

1. CONTRACTOR TO USE AS FEW CONNECTIONS AS POSSIBLE

2. CONNECTIONS TO BE MADE USING CSA CERTIFIED PRESSURE TYPE, DIRECT BURY (PER UL 486D) MECHANICAL CONNECTORS

3. A MINIMUM 5' OF ADDITIONAL TRACER WIRE TO BE COILED, BURIED, AND TERMINATED AT THE ENDS OF UNDERGROUND PEP

4. TRACER WIRE TO FOLLOW PEP ABOVEGROUND USING TRACER WIRE CLAMPS ALONG EACH ANODELESS RISER

3.6 INSTRUMENTATION AND SPECIALTY ITEMS

A. PRESSURE GAUGES: LIQUID FILLED, RANGE TO BE 150-200% OF MAXIMUM PRESSURE EXPECTED, TO BE MOUNTED ON BLEED/BLOCK VALVE UNLESS OTHERWISE SPECIFIED.

B. ESD VALVE (AV-1): FLANGED, FIRE-RATED BALL VALVE WITH ACTUATOR, FACTORY ASSEMBLED, PILOT-GAS-TO-OPEN, SPRING CLOSED.

C. FIRE EXTINGUISHER(S): AMEREX CORPORATION, COMPLIANCE FLOW MODEL #592 WITH A 4A:80B:C MINIMUM RATING, CURRENTLY CERTIFIED AND TAGGED WITH LOCAL INSPECTION TAG, MOUNTED IN A LOCKABLE WEATHER-PROOF ENCLOSURE, UNLESS OTHERWISE SPECIFIED.

3.7 INSTALLATION

A. THE CONTRACTOR SHALL USE ONLY TUBING INSTALLERS WHO ARE TRAINED AND CERTIFIED BY THE TUBE FITTING MANUFACTURER TO INSTALL TUBE AND ASSOCIATED FITTINGS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE PROOF OF CERTIFICATION TO CLEAN ENERGY'S PROJECT MANAGER PRIOR TO COMMENCING WORK.

B. ALL PIPING SHALL BE INSTALLED NEATLY AND IN A WORKMAN-LIKE MANNER. ALL PIPING SHALL BE PROPERLY ANCHORED, SUPPORTED, OR PITCHED ACCORDING TO THESE CONSTRUCTION SPECIFICATIONS AND THE DRAWINGS, OR IN THE ABSENCE OF SPECIFIC DETAIL, PER DIRECTION OF THE ENGINEER. ALL PIPING SHALL RUN TRUE TO VERTICAL AND HORIZONTAL AXES OF THE EQUIPMENT AND FACILITY. THE CONTRACTOR SHALL PROVE ALL PIPING IS FREE OF OBSTRUCTION AND DEBRIS, PRIOR TO CONNECTING TO ABOVEGROUND EQUIPMENT. AT NO TIME SHALL ANY GAS OR CNG PIPING BE CONSTRUCTED OVERHEAD UNLESS OTHERWISE NOTED ON THESE PLANS, OR AS APPROVED BY THE ENGINEER, NO EXCEPTIONS.

C. ALL VALVES SHALL BE INSTALLED NEATLY AND IN A WORKMAN-LIKE MANNER. ALL VALVES SHALL BE ACCESSIBLE FOR EASY OPERATION AND MAINTENANCE.

D. CLEAN THE INTERNAL PIPE SURFACE OVER ITS ENTIRE LENGTH, REMOVING ALL DIRT, DEBRIS, AND LOOSE CORROSION OR SCALE, BEFORE THE PIPE IS FITTED OR ALIGNED FOR WELDING. OPEN ENDS OF ALL PIPE RUNS SHALL BE KEPT SECURELY CLOSED TO PREVENT THE ENTRANCE OF DIRT, DEBRIS, WATER, OR ANIMALS INTO THE PIPE. ALL END CLOSURES SHALL BE APPROVED BY CLEAN ENERGY.

E. ALL CARBON STEEL PIPE WELDS SHALL INCLUDE A TIG (TUNGSTEN INERT GAS) ROOT. THE FILLER PASSES SHALL BE STICK SHIELDED METAL ARC WELDING (SMAW).

F. TUBE AND PIPE CONNECTIONS TO ALL EQUIPMENT REQUIRING MAINTENANCE ACCESS SHALL BE REMAKEABLE USING FLANGED, THREADED OR SWAGED FITTINGS. WELDED OR OTHER PERMANENT FITTINGS SHALL NOT BE USED AT THESE LOCATIONS.

3.8 FABRICATION, HANDLING AND STORAGE

A. ALL VALVES, PRE-FABRICATED PIPING, FLANGES, ETC. SHALL BE PROTECTED DURING STORAGE, TRANSIT, AND ERECTION WITH PLYWOOD COVERS 1/2" THICK AND SECURED WITH BOLTS FOR CLOSURE, OR EQUAL. SHOP FABRICATED SECTIONS SHALL NOT BE LEFT WITH OPEN ENDS EXPOSED TO ATMOSPHERE DURING STORAGE, TRANSIT, OR ERECTION. SUITABLE CAPS SHALL BE PROVIDED ON ALL MECHANICAL CONNECTIONS.

B. TEMPORARY SUPPORTS SHALL BE PROVIDED AND INSTALLED DURING ERECTION TO AVOID OVER-STRESSING PIPING OR EQUIPMENT TO WHICH PIPING IS CONNECTED.

3.9 TRENCHES

A. SEE GENERAL NOTE ON SHEET G-0.0

3.10 WELDING

A. WELDING PROCEDURES SHALL BE IN ACCORDANCE WITH ANSI B31.3-2008, "PROCESS PIPING, CHAPTER V, "FABRICATION, ASSEMBLY, AND ERECTION".

B. THE CONTRACTOR SHALL SUBMIT WELDING PROCEDURE SPECIFICATIONS (WPS) TO THE ENGINEER FOR APPROVAL, PRIOR TO STARTING WORK. EACH WPS SHALL BE IDENTIFIED WITH THE THE CONTRACTOR'S NAME AND IDENTIFICATION NUMBER. WELDING SHALL NOT COMMENCE UNTIL THE PROCEDURE IS APPROVED.

C. EACH WELDER MUST PROVIDE A COMPLETE PROCEDURE QUALIFICATION RECORD (PQR) SIGNED BY AN AUTHORIZED OFFICER OF THE TESTING LABORATORY OR DEPUTY WELDING INSPECTOR AND THE CONTRACTOR'S AUTHORIZED REPRESENTATIVE. PREVIOUS WELDING CERTIFICATION (ACTIVE CERTIFICATION WITHIN THE PREVIOUS SIX (6) MONTHS) MAY BE SUBMITTED FOR APPROVAL.

D. WELD TESTS SHALL BE PERFORMED PER ANSI B31.3, AND APPROVED BY THE ENGINEER.

1. NOT LESS THAN 5% OF ALL BUTT WELDS BY EACH WELDER PERFORMING WORK AT THE SITE SHALL BE RANDOMLY SELECTED AND RADIOGRAPHED.

2. RADIOGRAPHS SHALL BE EVALUATED BY A CERTIFIED RADIOGRAPHIC INTERPRETER. THE RADIOGRAPHIC INTERPRETER'S WRITTEN REPORT OF HIS EVALUATION SHALL BE SUBMITTED TO CLEAN ENERGY BEFORE THE WELDS ARE BURIED.

3.11 PIPE COATING AND PAINTING

A. ALL UNDERGROUND CARBON STEEL PIPE SHALL BE FACTORY-COATED WITH FUSION-BONDED EPOXY (FBE), TO MEET ALL CODE REQUIREMENTS INCLUDING THOSE ESTABLISHED BY LOCAL UTILITY COMPANY OR JURISDICTIONS.

1. FACTORY COATING SHALL BE DESIGNED TO RESIST DISBONDMENT WHEN EXPOSED TO CATHODIC PROTECTION CURRENTS.

2. FACTORY COATING SHALL BE 3M SCOTCHKOTE FUSION-BONDED EPOXY COATING 6233P. NO OTHER COATING IS ACCEPTABLE WITHOUT PRIOR APPROVAL BY THE ENGINEER

B. WELDED PIPE JOINTS AND FITTINGS FOR UNDERGROUND PIPING SYSTEMS SHALL BE FIELD-COATED IN ACCORDANCE WITH CURRENT CODES AND THE COATING MANUFACTURER'S APPLICATION MANUAL. FIELD COATING SHALL BE APPROVED BY THE DESIGNATED INSPECTOR PRIOR TO BURIAL. FIELD COATING SHALL BE 3M SCOTCHKOTE LIQUID EPOXY COATING 323P.

C. PRIOR TO BURIAL, COATED PIPE SHALL BE TESTED ALONG ITS ENTIRE LENGTH WITH AN ELECTRIC HOLIDAY DETECTOR. ANY HOLIDAYS DETECTED SHALL BE REPAIRED PER "B" ABOVE FOR 6" ON EITHER SIDE OF THE HOLIDAY. AFTER ALL HOLIDAYS ARE REPAIRED, THE ENTIRE LENGTH OF PIPE SHALL BE TESTED AGAIN.

D. EXPOSED PIPING, VALVES, FITTINGS, FLANGES AND RELATED MATERIAL SHALL BE PRIMED AND PAINTED WITH AN INDUSTRIAL MAINTENANCE COATING, IN ACCORDANCE WITH THE PAINT MANUFACTURER'S INSTRUCTION MANUAL. PRIMER SHALL BE DEVOE DEVPRIME 1407, AND FINISH , DEVCRYL 1449. FINISH COLOR SHALL BE SAFETY YELLOW. AT UNDERGROUND PIPE RISERS, EPOXY COATING SHALL EXTEND A MINIMUM OF 2 INCHES ABOVE THE FINISHED GROUND SURFACE.

3.12 CATHODIC PROTECTION

A. ALL BURIED STEEL PORTIONS OF THE PIPING SYSTEM SHALL BE ELECTRICALLY ISOLATED (USING DIELECTRIC FITTINGS) AND CATHODICALLY PROTECTED IN ACCORDANCE WITH CURRENT CODES AND NACE INTERNATIONAL STANDARD RP0169, CURRENT EDITION TO INSURE A -850 MILLIVOLT PIPE-TO-SOIL POTENTIAL FOR A MINIMUM OF 30 YEARS. SOIL RESISTIVITY TEST SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

B. THE CONTRACTOR SHALL FURNISH ALL PERMANENT MATERIALS FOR TEST LEADS, INCLUDING WIRE, CONDUIT AND FITTINGS, TERMINAL POST, TERMINAL UNITS, CAD WELD THERMITE CARTRIDGES, ETC. PER INDUSTRY ACCEPTED PRACTICES.

C. ELECTRICAL TEST LEADS SHALL BE TERMINATED IN A FRAME AND COVERED AT FINISHED GRADE.

3.13 PNEUMATIC PRESSURE TEST

A. WHEN ASSEMBLY (WELDED OR MECHANICAL) OF A GAS PIPING OR TUBING SYSTEM IS COMPLETE, A PNEUMATIC PRESSURE TEST SHALL BE PERFORMED IN ACCORDANCE WITH ASME/ANSI B31.3. THE CONTRACTOR SHALL NOTIFY CLEAN ENERGY'S PROJECT MANAGER THAT A TEST IS SCHEDULED, NOT LESS THAN 48 HOURS BEFORE THE TEST IS SCHEDULED TO BEGIN.

B. AT NO TIME SHALL THE TUBING ASSEMBLY BE HYDROSTATICALLY TESTED, NO EXCEPTIONS.

THE PRESSURE TEST PRESSURE SHALL BE AS FOLLOWS:

PIPE	PRESSURE
CNG PIPING AND TUBING (AFTER COMPRESSOR)	5,500 PSIG
NATURAL GAS PIPING (BEFORE COMPRESSOR)	40 PSIG
VENT PIPING (V)	N/A

C. IN THE EVENT THAT COLD WEATHER LIMITS ACHIEVABLE TEST PRESSURES TO BELOW THOSE SPECIFIED ABOVE, THE CONTRACTOR SHALL SUBMIT AN ALTERNATIVE COLD WEATHER PRESSURE TEST PLAN TO CLEAN ENERGY FOR APPROVAL.

D. REMOVE ALL PRESSURE SENSITIVE DEVICES FROM SYSTEM TO BE TESTED.

E. CONNECT A SOURCE OF HIGH-PRESSURE INERT GAS (NITROGEN) WITH APPROPRIATE REGULATOR, GAUGES, VALVES AND FITTINGS TO ONE END OF THE SYSTEM TO ALLOW SYSTEM TO BE SAFELY PRESSURIZED AND DEPRESSURIZED.

F. INTRODUCE INERT GAS INTO THE SYSTEM. SLOWLY INCREASE PRESSURE TO 500 PSIG AND CHECK FOR LEAKS. IF NO LEAKS ARE DETECTED, CONTINUE TO INCREASE PRESSURE, IN 500 PSIG INCREMENTS, HOLDING AT EACH STAGE LONG ENOUGH TO ALLOW RESIDUAL STRESSES TO EQUALIZE, UNTIL MAXIMUM PRESSURE IS REACHED. HOLD FOR 30 MINUTES, THEN REDUCE PRESSURE TO STATED DESIGN PRESSURE. RECORD BOTH PRESSURES.

G. INSPECT AND LEAK TEST ALL JOINTS AND FITTINGS WITH A SUITABLE LEAK TEST SOLUTION. IDENTIFY LEAKS, IF ANY AND BLEED OFF THE GAS IN A CONTROLLED AND SAFE MANNER. IF A LEAK IS FOUND, REPAIR THE LEAK(S) AND REPEAT THE LEAK TEST.

H. ISOLATE THE PRESSURIZED PIPE AT DESIGN PRESSURE FROM THE PRESSURE SOURCE. RECORD PRESSURE READINGS AND AMBIENT TEMPERATURES AT 10 MINUTE INTERVALS. RECORD DATA WITH THE PIPING SYSTEM UNDISTURBED FOR NOT LESS THAN 1/2 HR. PIPING SYSTEM SHALL SHOW NO LOSS OF PRESSURE, CORRECTED FOR TEMPERATURE CHANGES, DURING THE TEST. SUBMIT TEST DATA TO CLEAN ENERGY'S PROJECT MANAGER FOR APPROVAL, PRIOR TO BURYING THE PIPE OR TUBING.

I. UPON COMPLETION OF THE PNEUMATIC PRESSURE TEST, ALL PRESSURE SENSITIVE DEVICES SHALL BE REINSTALLED IN THE SYSTEM, THE SYSTEM PRESSURIZED TO NORMAL OPERATING PRESSURES AND THEIR CONNECTIONS TESTED FOR LEAKS.

J. THE CONTRACTOR SHALL USE AN APPROVED LEAK DETECTION SOLUTION (SNOOP OR EQUAL), TO TEST ALL PIPE FITTINGS AND CONNECTIONS DURING TESTING AND AT START-UP.

3.14 PURGING AND PRESSURIZING

D. ALL PURGING AND PRESSURIZING SHALL BE PERFORMED BY THE CONTRACTOR AND OBSERVED BY THE ENGINEER OR THE ENGINEER'S DESIGNATED REPRESENTATIVE. THE ESD SYSTEM SHALL BE OPERATIONAL BEFORE THE PIPING SYSTEM IS PRESSURIZED WITH NATURAL GAS. NATURAL GAS SHALL NOT BE INTRODUCED INTO THE SYSTEM WITHOUT PRIOR AUTHORIZATION BY CLEAN ENERGY'S CONSTRUCTION MANAGER. ALL AIR SHALL BE PURGED FROM THE ENTIRE SYSTEM TO THE SATISFACTION OF CLEAN ENERGY'S CONSTRUCTION MANAGER, AND IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTRUCTIONS, BEFORE THE SYSTEM MAY BE PRESSURIZED.

E. ALL FABRICATION, WELD TESTING, PRESSURE TESTING AND WORK REQUIRING FLAME OR SPARKING DEVICES SHALL BE COMPLETED BEFORE INTRODUCING NATURAL GAS TO ANY PIPING SYSTEM.

EXP. DATE: 10/31/2017
COLORADO LICENSED
RICHARD L. REMILLARD
0047005
PROFESSIONAL ENGINEER
DATE SIGNED:

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

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CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
PIPING NOTES

ASSET NO: 160-11-17307.02.00

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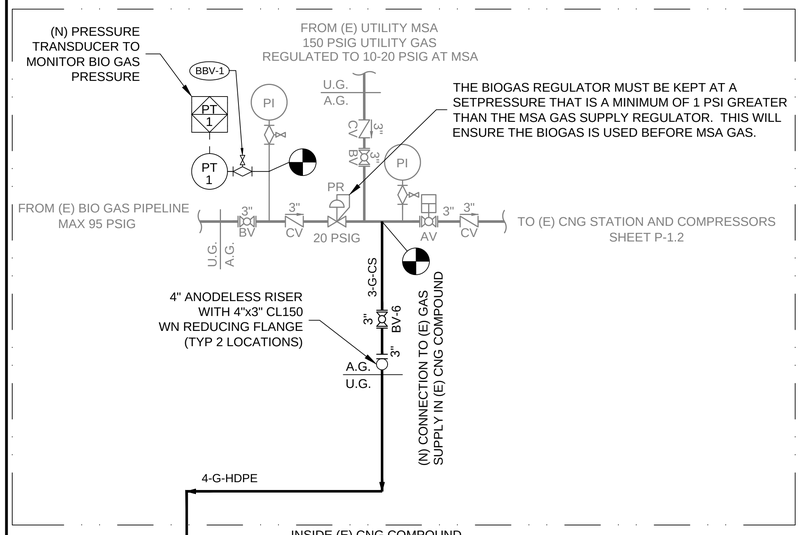
W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.00)\2.0 Drawings and Engineering\00-P\00-PIPING NOTES.dwg - PLOTTED: May 12, 2017 - 1:28pm

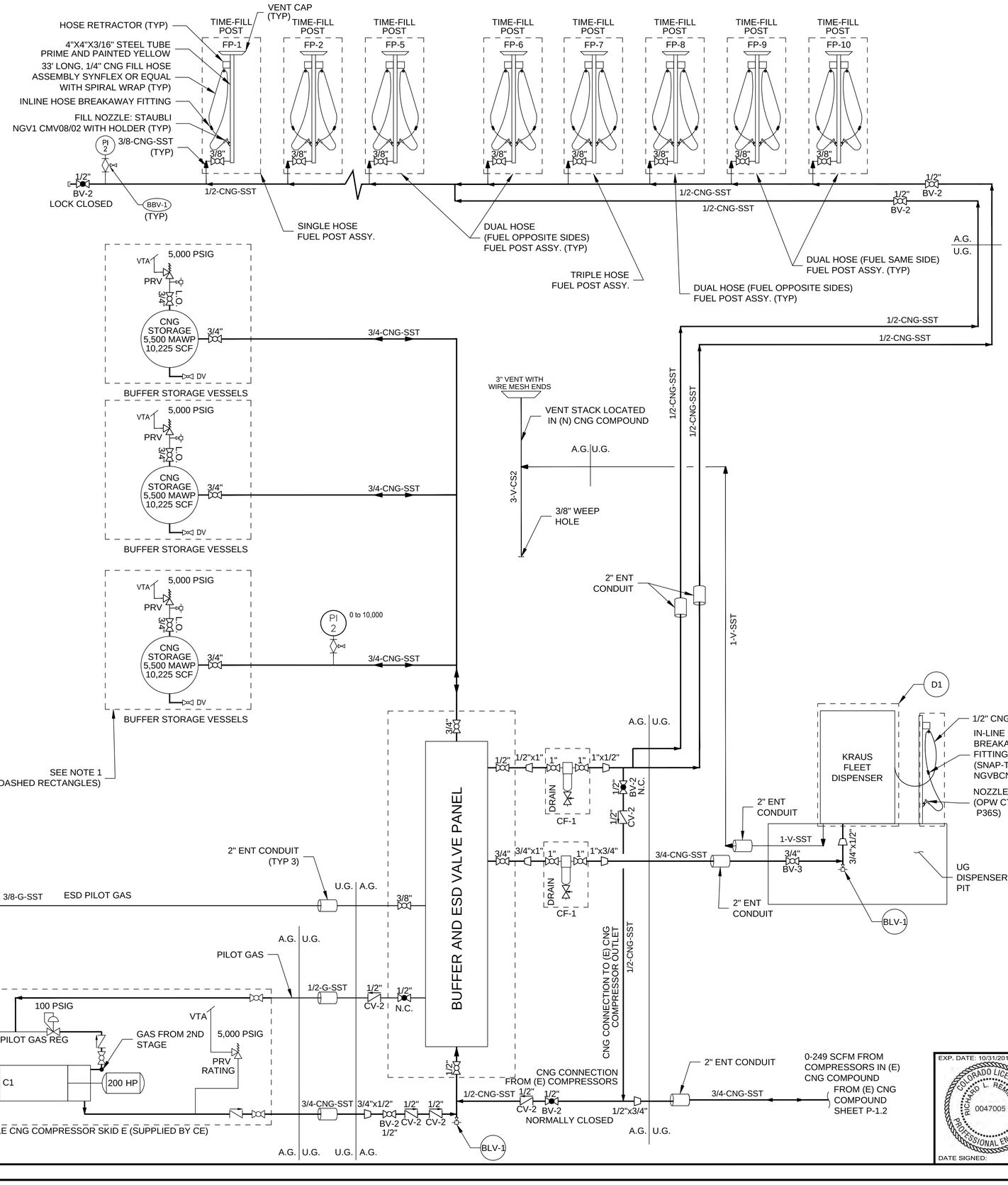
GENERAL NOTES:

1. EQUIPMENT INSIDE THE DASHED LINE IS PART OF THE MANUFACTURER'S FACTORY ASSEMBLY PROVIDED BY CLEAN ENERGY.
2. CLEAR SPACE OF AT LEAST 3 FEET SHALL BE PROVIDED FOR ACCESS TO ALL VALVES AND FITTINGS OF MULTIPLE GROUPS OF CONTAINERS.
3. EMERGENCY SHUT-OFF DISCONNECT WILL DISCONNECT ELECTRICAL POWER AND STOP DISPENSING OPERATIONS.
4. SELF CLOSING VALVES ON THE INLET OF THE COMPRESSORS SHALL SHUT OFF THE GAS SUPPLY TO THE COMPRESSOR WHEN ONE OF THE FOLLOWING OCCURS:
   - 4.1. AN EMERGENCY SHUTDOWN DEVICE IS ACTIVATED.
   - 4.2. A POWER FAILURE OCCURS.
   - 4.3. THE POWER TO THE COMPRESSOR IS SWITCHED TO THE OFF POSITION .
5. VALVE PANEL IS EQUIPT WITH AN OVER-PRESSURE PROTECTION DEVICE IN THE FUELING TRANSFER SYSTEM TO PREVENT OVERPRESSURE IN THE VEHICLE PER 2013 NFPA 52.
6. CONTROL CIRCUIT SHALL BE ARRANGED SO THAT, WHEN AN EMERGENCY SHUTDOWN DEVICE IS ACTIVATED OR ELECTRICAL POWER IS CUT OFF, SYSTEMS THAT SHUT DOWN SHALL REMAIN DOWN UNTIL MANUALLY ACTIVATED OR RESET AFTER A SAFE CONDITION IS RESTORED PER 2013 NFPA 52.
7. IF MSA OUTLET PRESSURE EXCEEDS 100PSIG PLASTIC PIPE CANNOT BE USED. PLEASE CONTACT CE ENGINEERING TO DETERMINE AN APPROVED SUBSTITUTE.

PROPERTY SYSTEM PERFORMANCE	
MSA OUTLET PRESSURE [PSIG]	FLOW RATE [SCF/MIN]
20	580

NEW COMPRESSOR SYSTEM PERFORMANCE	
INLET FLANGE PRESSURE [PSIG]	FLOW RATE [SCF/MIN]
17	331





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GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
PIPING AND INSTRUMENTATION DIAGRAM

ASSET NO: 160-11-17307.02.00

EXP. DATE: 10/31/2017
COLORADO LICENSED
RICHARD L. REMLEY
0047005
PROFESSIONAL ENGINEER
DATE SIGNED:

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W:\Engineering Projects - Current\Grand Junction CO - Grand Valley Transit (2820.00)\2.0 Drawings and Engineering\009-P01.1-P&ID SCHEDULE.dwg - PLOTTED: May 12, 2017 - 1:28pm

EQUIPMENT SCHEDULE

ITEM NO	MARK	QTY.	DESCRIPTION	MFR.	MODEL NO.	MAWP [PSIG]	SERVICE PRESSURE [PSIG]	SIZE OR CAPACITY
1		1	GAS DRYER	PSB	NG-SV-10-3	200	15-20	3" INLET & OUTLET 525 SCF/MIN @ 20 PSIG
2	SKID E	1	CNG COMPRESSOR SKID	J-W POWER	CNG2200-4Q-C5	13-23 (INLET) 5,000 (OUTLET)	15-20 (INLET) 4,500 (OUTLET)	200 HP 331 SCF/MIN @ 17 PSIG
3	CF-1	2	SINGLE COALESCING FILTER ASSY.	FILTER: PARKER FILTER RACK: CEC	JN4C-4CN 506772	5,000	4,500	1" INLET & OUTLET
4	V-1	3	CNG STORAGE VESSEL (SPHERE)	ALLIED	48" SPHERE	5,500	4,500	48" SPHERE (63"H X 56"W) 10,225 SCF @ 100°F (33.5 ACF)
5		1	BUFFER/ESD VALVE PANEL	CEC	3C-2D-1TF-1S-1/2"	5,000	4,500	1/2", 2 INLETS, 3 OUTLETS 1,000 SCF/MIN MAX
6	D1	1	LIGHT DUTY CNG DISPENSER	KRAUS	HIGH STYLE SAM 1CHG-P62CG11SXX01	4,500	4,500	(1) 1/2" INLET (1) 1/2" HOSE
7	FP 7	1	FUEL POST W/ (3) FUEL HOSE ASSY.	CEC	(1) TRIPLE FUEL POST (3) 506615 FUEL HOSES	4,500	4,500	TRIPLE FUEL POST (3) 1/4"x33' HOSES
8	FP 2-6 FP 8	6	FUEL POST W/ (2) FUEL HOSE ASSY.	CEC	(1) 506685 (2) 506615 FUEL HOSES	4,500	4,500	TWIN OPPOSITE-SIDE FUEL POST (2) 1/4"x33' HOSES
9	FP 9,10	2	FUEL POST W/ (2) FUEL HOSE ASSY.	CEC	(1) 506684 (2) 506615 FUEL HOSE	4,500	4,500	TWIN SAME-SIDE FUEL POST (2) 1/4"x33' HOSES
10	FP 1	1	FUEL POST W/ (1) FUEL HOSE ASSY.	CEC	(1) 506686 (1) 506615 FUEL HOSE	4,500	4,500	SINGLE FUEL POST (1) 1/4"x33' HOSE

VALVE AND INSTRUMENTATION SCHEDULE

MARK	SIZE	CONNECTION	MATERIAL	DESCRIPTION	MFR.	PART NO.	MAWP [PSIG]	SERVICE PRESSURE [PSIG]	NOTE
AV-1	3"	CL 150 RFF	CS	ACTUATED BALL VALVE	SVF	B41C4466AGRF10300000	285	125-150	FIRE-RATED
	400		VARIOUS	PNEUMATIC ACTUATOR	SVF	A2S-400-10	120	110	GAS-ACTUATED, SPRING RETURN
BLV-1	1/2"	MPT	316 SS	BLEED VALVE	SWAGELOK	SS-BVM8	9,290	4,500	
BBV-1	1/4"	MPT	316 SS	BLOCK & BLEED VALVE	WIKA	4339747	10,000	15-4500	
BV-1	3/8"	SWAGED	316 SS	CNG BALL VALVE	SWAGELOK	SS-AFSS6-LH	6,000	95-4,500	LOCKABLE HANDLE
BV-2	1/2"	SWAGED	316 SS	CNG BALL VALVE	SWAGELOK	SS-AFSS8-LH	6,000	4,500	LOCKABLE HANDLE
BV-3	3/4"	SWAGED	316 SS	CNG BALL VALVE	SWAGELOK	SS-AFSS12	5,800	4,500	
BV-6	3"	CL 150 RFF	CS	GAS BALL VALVE	SVF	B41C4466AGRF10300000	285	15-20	FIRE-RATED
BV-7	4"	CL 150 RFF	CS	GAS BALL VALVE	SVF	B41C4466AGRF10400000	285	15-20	FIRE-RATED
CV-1	3/8"	SWAGED	316 SS	CNG CHECK VALVE	SWAGELOK	SS-CHS6-25	5,000	4,500	
CV-2	1/2"	SWAGED	316 SS	CNG CHECK VALVE	SWAGELOK	SS-CHS8-25	5,000	4,500	
FH-1	4"	CL 150 RFF	SS	FLEX HOSE	UNISOURCE "SUPERFLEX"	SF22CSA-400-49-49-36	285	15-20	CSA-LISTED
IS-1	3"	CL 150 RFF	CS	INLET Y-STRAINER	KECKLEY	32RFY-CSM40L36-SBB-SA7	285	15-20	
IS-2	4"	CL 150 RFF	SS	INLINE CONE STRAINER	FPS	CS-S04-150-40_W40	185	15-20	
PI-1	2.50"	1/4" MPT	316 SS	PRESSURE GAUGE	WIKA	9831873	60	15-20	GLYCERIN-FILLED
PI-2	2.50"	1/4" MPT	316 SS	PRESSURE GAUGE	WIKA	9832004	10,000	1,000-4,500	GLYCERIN-FILLED
PT-1	1/4"	MPT	SS	PRESSURE TRANSDUCER	WIKA	N10200PSI420MA14NPT12C6'CBL	0-200	20-95	
PV-1	1/2"	MPT	316 SS	PURGE VALVE	SWAGELOK	SS-4PM8	3720	15-20	

PIPE AND TUBING SCHEDULE

MARK	SIZE	BASIS	SCH	WALL THK [IN]	MATERIAL	SPECIFICATION	MAWP [PSIG]	SERVICE PRESSURE [PSIG]	SERVICE TEMP. [°F]	NOTE
1-V-SST	1"	OD	316 SS	0.120	316 SS	ASTM A269	5,280	5,000	30-130	0.120" MIN. WALL SEAMLESS TUBE
1-V-CS2	1"	NPS	80	0.179	CS	ASTM A106B	3,470	0-3,000	30-130	SEAMLESS PIPE
3-V-CS2	3"	NPS	80	0.300	CS	ASTM A106B	2,360	0-1,000	30-130	SEAMLESS PIPE
3-G-CS	3"	NPS	40	0.216	CS	ASTM A106B	1,460	15-20	30-110	SEAMLESS PIPE
4-G-CS	4"	NPS	40	0.237	CS	ASTM A106B	1,300	15-20	30-110	SEAMLESS PIPE
4-G-HDPE	4"	NPS	SDR 11	0.409	HDPE	ASTM D2513	100	15-20	50-70	HDPE, PE4710
3/8-CNG-SST	3/8"	OD	(TUBE)	0.065	316 SS	ASTM A269	6,820	90-4,500	30-130	SEAMLESS TUBE
1/2-CNG-SST	1/2"	OD	(TUBE)	0.083	316 SS	ASTM A269	6,810	120-4,500	30-130	SEAMLESS TUBE
3/4-CNG-SST	3/4"	OD	(TUBE)	0.109	316 SS	ASTM A269	5,880	120-4,500	30-130	SEAMLESS TUBE
1-CNG-SST	1"	OD	(TUBE)	0.120	316 SS	ASTM A269	5,280	120-4,500	30-130	0.120" MIN. WALL SEAMLESS TUBE

LEGEND

LINE DESIGNATION

LINE SIZE – 3-G-HDPE – PRODUCT – MATERIAL

ABBREVIATIONS

A.G.	ABOVE GROUND
CNG	COMPRESSED NATURAL GAS
CS	CARBON STILL (SCH. 40)
CS2	CARBON STEEL (SCH. 80)
XXS	CARBON STEEL (SCH. XXS)
D	DRAIN
ESD	EMERGENCY SHUTDOWN
(E)	EXISTING
(F)	FUTURE
FP	FUEL POST
FMT	FUEL MNGMNT. TERMINAL
G	NATURAL GAS (0-400 PSIG)
H	HIGH
L	LOW
L.O.	LOCKED OPEN
L.C.	LOCKE CLOSED
M	METER
(N)	NEW
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
PI	PRESSURE INDICATOR
PEP	POLYETHYLENE PIPE
PRV	PRESSURE RELIEF VALVE
RR	REMOVE AND REPLACE
S	SOLENOID
SS	STAINLESS STEEL
SST	STAINLESS STEEL TUBE
(TYP)	TYPICAL
U.G.	UNDERGROUND
V	VENT

SYMBOLS

- BALL VALVE
- NORMALLY CLOSED VALVE
- CHECK VALVE
- NEEDLE VALVE
- PLUG VALVE
- 3-WAY VALVE
- BLOCK AND BLEED VALVE
- PRESSURE REGULATOR (SETTING AS NOTED)
- BLEED OR PURGE VALVE
- GAS-ACTUATED VALVE
- SOLENOID VALVE
- SOLENOID VALVE (3-WAY)
- LOCAL INSTRUMENT OR GAUGE
- PANEL MOUNTED INSTRUMENT OR GAUGE
- POINT OF CONNECTION
- RELIEF VALVE
- FLEXIBLE HOSE
- PLUG
- CAP
- UNION
- HOSE COUPLING
- THREADED PLUG
- FILTER
- FLEX CONNECTOR
- PRESSURE INDICATOR (RANGE AS NOTED)
- PIPE REDUCTION/ EXPANSION CONICAL
- STRAINER (BUILT-IN)
- PRIMARY LOCATION PROGRAMMABLE LOGIC CONTROL
- ELECTRICAL SIGNAL
- PNEUMATIC SIGNAL

EXP. DATE: 10/31/2017

COLORADO LICENSED RICHARD L. REMILLARD 0047005 PROFESSIONAL ENGINEER

DATE SIGNED:

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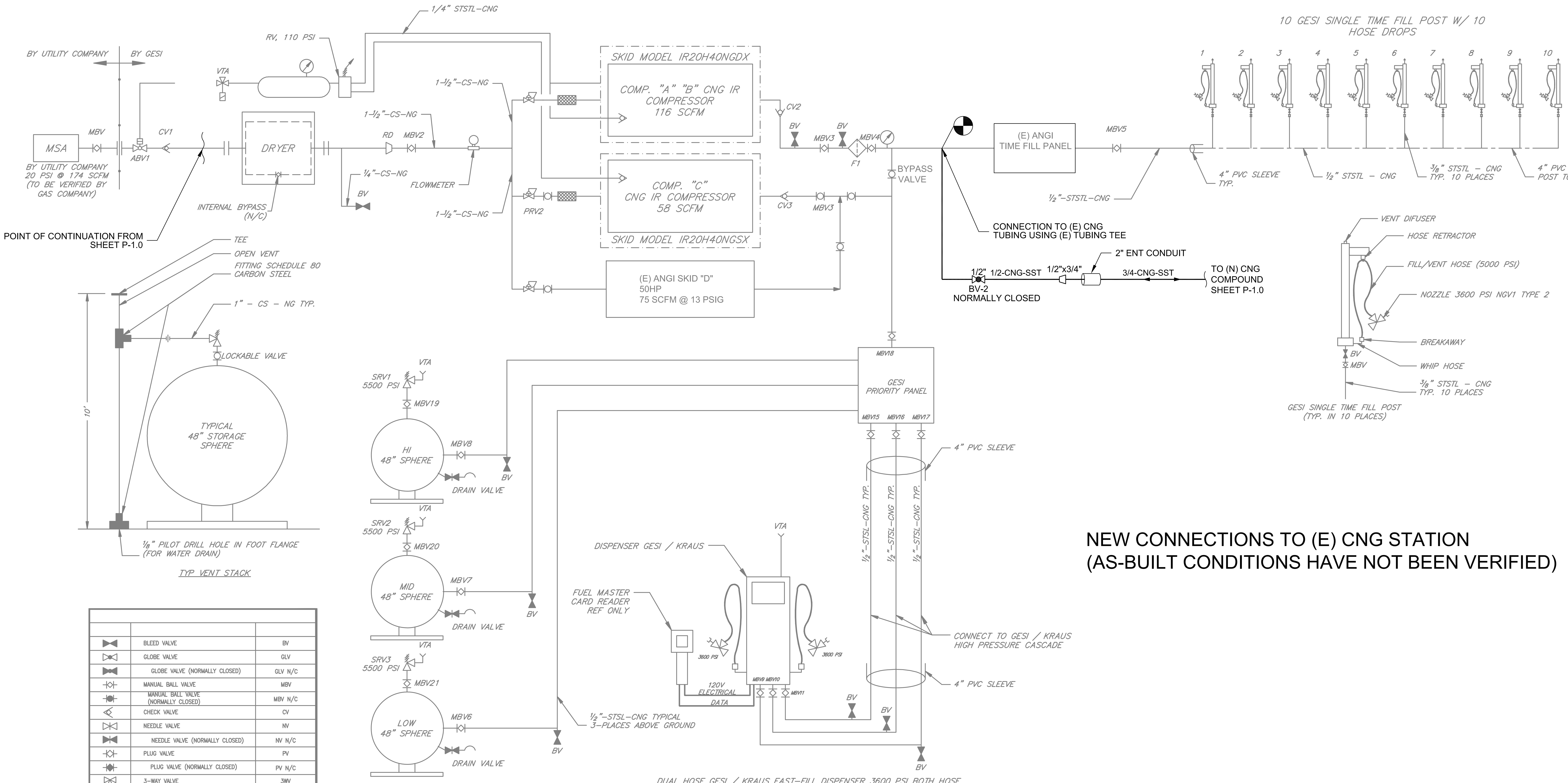
GRAND JUNCTION, CO 81501
PIPING AND INSTRUMENTATION SCH.

ASSET NO: 160-11-17307.02.00

DATE	DESIGNED BY	xxx
05/01/2017	CHECKED BY	MES
	APPROVED BY	RLR

SCALE: AS NOTED

SHEET: P-1.1



	BLEED VALVE	BV
	GLOBE VALVE	GLV
	GLOBE VALVE (NORMALLY CLOSED)	GLV N/C
	MANUAL BALL VALVE	MBV
	MANUAL BALL VALVE (NORMALLY CLOSED)	MBV N/C
	CHECK VALVE	CV
	NEEDLE VALVE	NV
	NEEDLE VALVE (NORMALLY CLOSED)	NV N/C
	PLUG VALVE	PV
	PLUG VALVE (NORMALLY CLOSED)	PV N/C
	3-WAY VALVE	3WV
	PRESSURE REGULATOR	PRV
	GAS ACTIVATED VALVE	GAV
	SOLENOID VALVE (2-WAY)	SV
	SOLENOID VALVE (3-WAY)	3WSV
	REDUCER	RD
	RELIEF VALVE	RV OR SRV
	FLEXIBLE HOSE	FH
	CAP	CP
	PLUG	PLG
	UNION	UN
	LOCAL INSTRUMENT OR GAUGE	PG
	PANEL MOUNTED INSTRUMENT OR GAUGE	PM
	POINT OF CONNECTION	PC
	FLANGE	FG
	BELOW GRADE	–
	ACTUATED BALL VALVE	ABV
	NOWATA COALESCER	F1
	FLOWMETER	
	FITTING SCHEDULE 80 CARBON STEEL	

TABLE

SYMBOL	QTY	DESCRIPTION	GESI PART NUMBER
MBV1	1	BALL VALVE ¼"	BY UTILITY
CV1	1	CHECK VALVE	KF SERIES 35
MBV2	1	BALL VALVE 1-1/2"	APOLLO 489-100
MBV3	1	BALL VALVE ½"	7223G8Y
BV	9	BLEED VALVE	667098Y316
CV2-CV3	1	½" CHECK VALVE	625398Y316
PG1	1	PRESSURE GAUGE	K6K6GF-6000
MBV4 – MBV11	9	BALL VALVE ½" GYROLOK OR EQUAL	7223G8Y
SRV1 – SRV3	3	SAFETY RELIEF VALVE 5500 PSI (ALLIED)	SUPPLIED WITH 48" VESSEL
MBV12 – MBV18	7	BALL VALVE (HALE HAMILTON)	PART OF PRIORITY PANEL
MBV 19 – MBV21	3	1" BALL VALVE FEMALE NPT.	HBEV766DTSE1
ABV	1	ACTUATED VALVE	JAMESBURY
F1	1	COALESCER	NOWATA
–	–	–	–

PIPING TABLE

ABBREVIATION	DESCRIPTION
PLP	PE PIPE (PLASTIC)
STSTL	STAINLESS STEEL
NG	NATURAL GAS (INLET)
CS	CARBON STEEL SCH 40.
CNG	COMPRESSED NATURAL GAS
CS2	CARBON STL SCH 80
PVC	PVC PIPE

TYPICAL EXAMPLE 2"-PLP-NG IS 2" PIPE X PE PIPE PLASTIC X NATURAL GAS.

TIME FILL DETAILS

SYMBOL	QTY	DESCRIPTION	GESI PART NUMBER
MBV	10	BALL VALVE ¼"	7115G4Y
BV	10	BLEED VALVE	6610M6Y316
–	–	–	–
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–	–	–	–

EXP. DATE: 10/31/2017
COLORADO LICENSED PROFESSIONAL ENGINEER RICHARD L. REMILLARD 0047005
DATE SIGNED:

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PIPING AND INSTRUMENTATION DIAGRAM (EXISTING STATION)

ASSET NO: 160-11-17307.02.00

DATE 05/01/2017 | DESIGNED BY ARY | CHECKED BY MES | APPROVED BY RLR
SCALE AS NOTED
SHEET P-1.2

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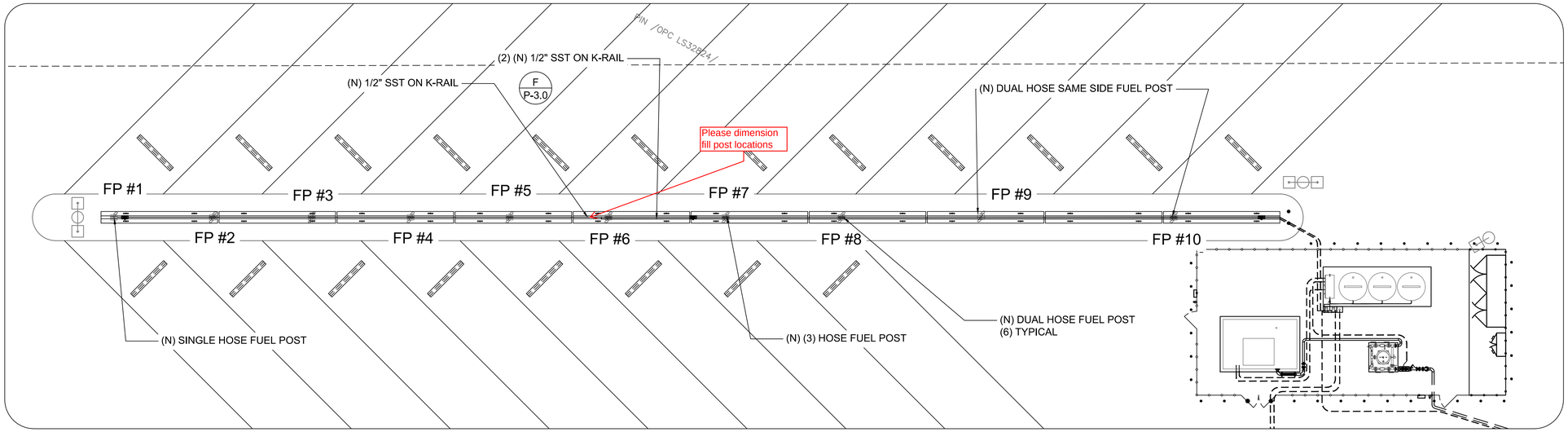
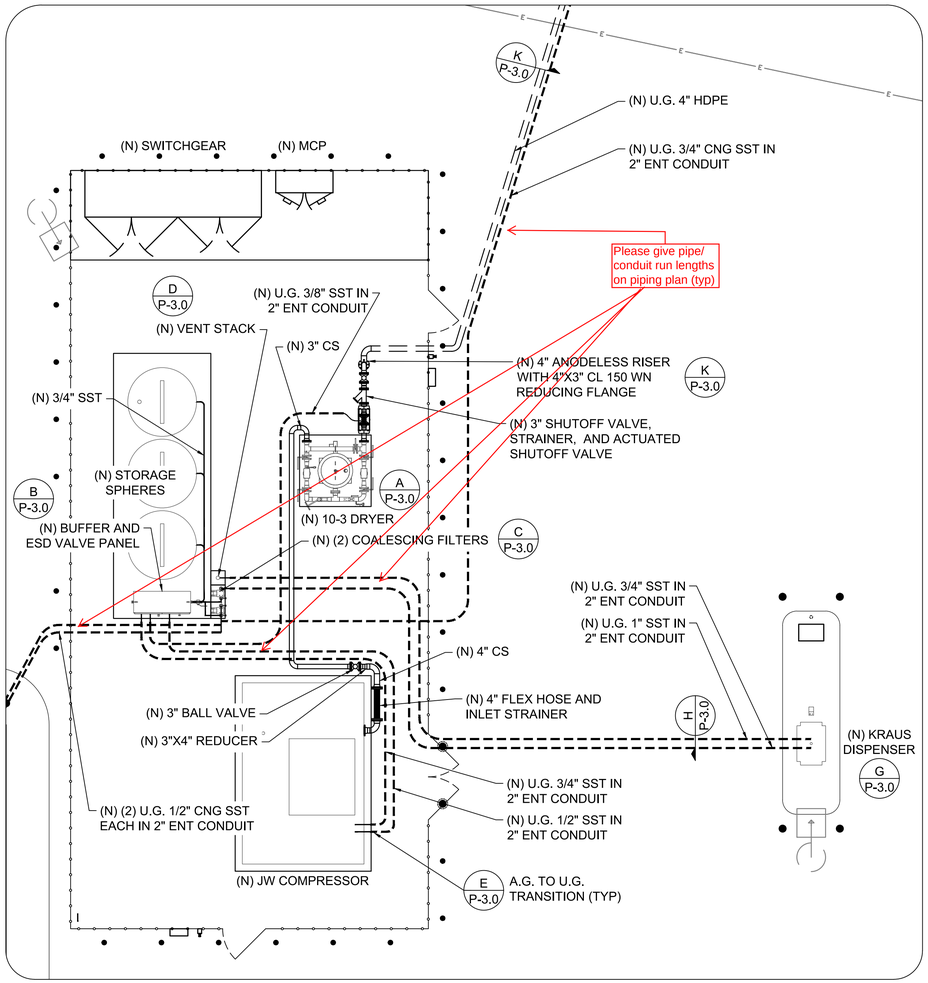


TIME FILL PIPING PLAN (1"=10')

10 5 0' 10 20

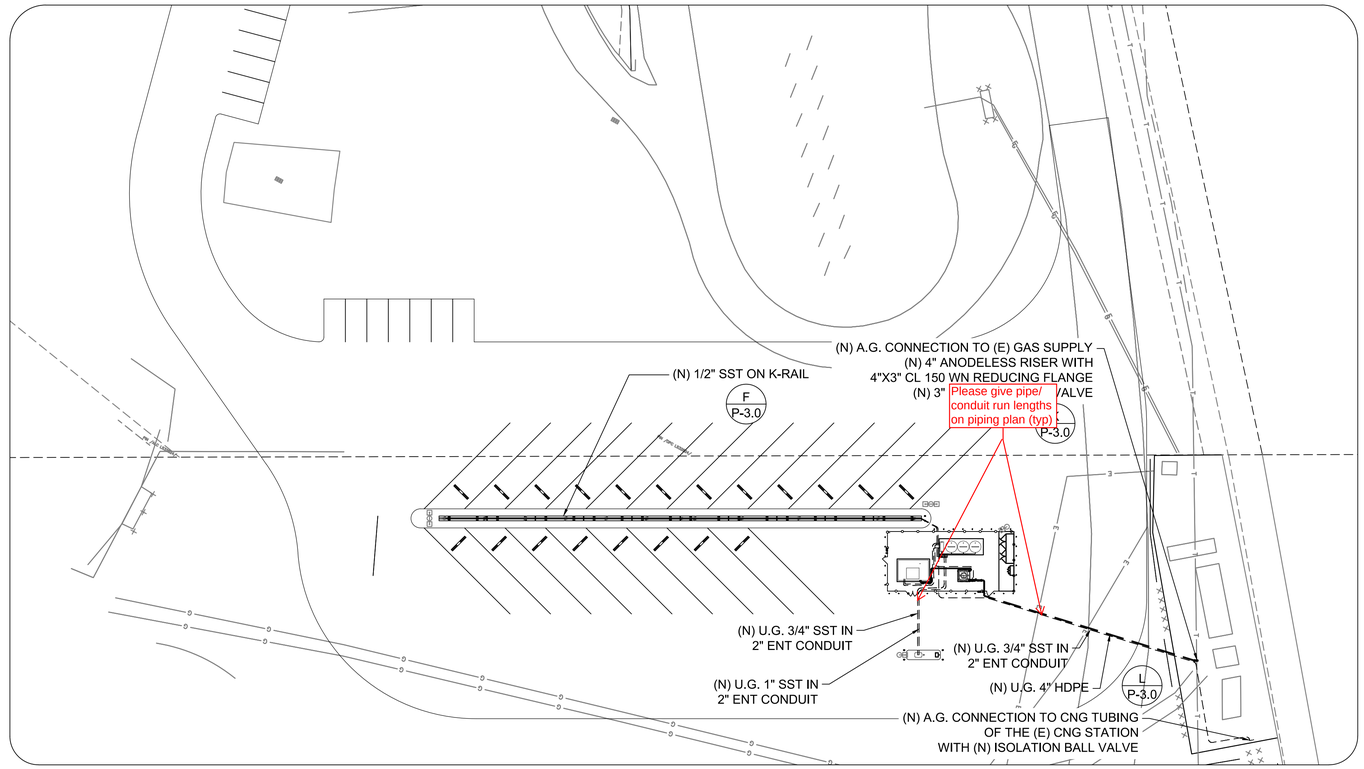
GRAPHIC SCALE



EQUIPMENT COMPOUND PIPING PLAN (1" = 5')

5' 2.5' 0' 5' 10'

GRAPHIC SCALE



OVERALL PIPING PLAN (1"=30')

30' 15' 0' 30' 60'

GRAPHIC SCALE

GENERAL PIPING NOTES

1. SEE DRAWING P-0.0 FOR ADDITIONAL REQUIREMENTS.
2. MAINTAIN 10' MINIMUM CLEAR DISTANCE OF NEW GAS METER SET TO ELECTRICAL MAIN SWITCHBOARD AND SIMILAR EQUIPMENT.
3. EQUIPMENT TIE-INS AND ROUTING SHOWN IS APPROXIMATE AND MAY VARY AS MUCH AS 5 FEET IN ANY DIRECTION TO ACCOMMODATE FIELD CONDITIONS. REFER TO VENDORS' CERTIFIED DRAWINGS AND INSTALLATION INSTRUCTIONS FOR FURTHER INFORMATION.
4. ALL BURIED STAINLESS STEEL TUBING SHALL BE RUN IN CONTINUOUS PVC OR ENT SLEEVE(S). TUBING SHALL BE CONTINUOUS WITH NO VALVES, UNIONS, OR FITTINGS BURIED OR INACCESSIBLE.
5. SEE DRAWING P-4.0 FOR SAFETY SIGNAGE DETAILS AND LOCATIONS.
6. FIRE EXTINGUISHER(S): 4A: 80B:C MINIMUM RATING, CURRENTLY CERTIFIED AND TAGGED WITH LOCAL INSPECTION TAG, MOUNTED IN A LOCKABLE WEATHER-PROOF ENCLOSURE, UNLESS OTHERWISE SPECIFIED, AND WITHIN 50-FEET OF DISPENSERS AND AT THE EQUIPMENT COMPOUND.
7. RUN TIME FILL PIPING ABOVE GROUND ON JERSEY BARRIER. PROVIDE UNISTRUT SUPPORTS 6' MAX O.C.

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PIPING PLAN

ASSET NO: 160-11-17307.02.00

EXP. DATE: 10/31/2017
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RICHARD L. REMILLARD
0047005
PROFESSIONAL ENGINEER
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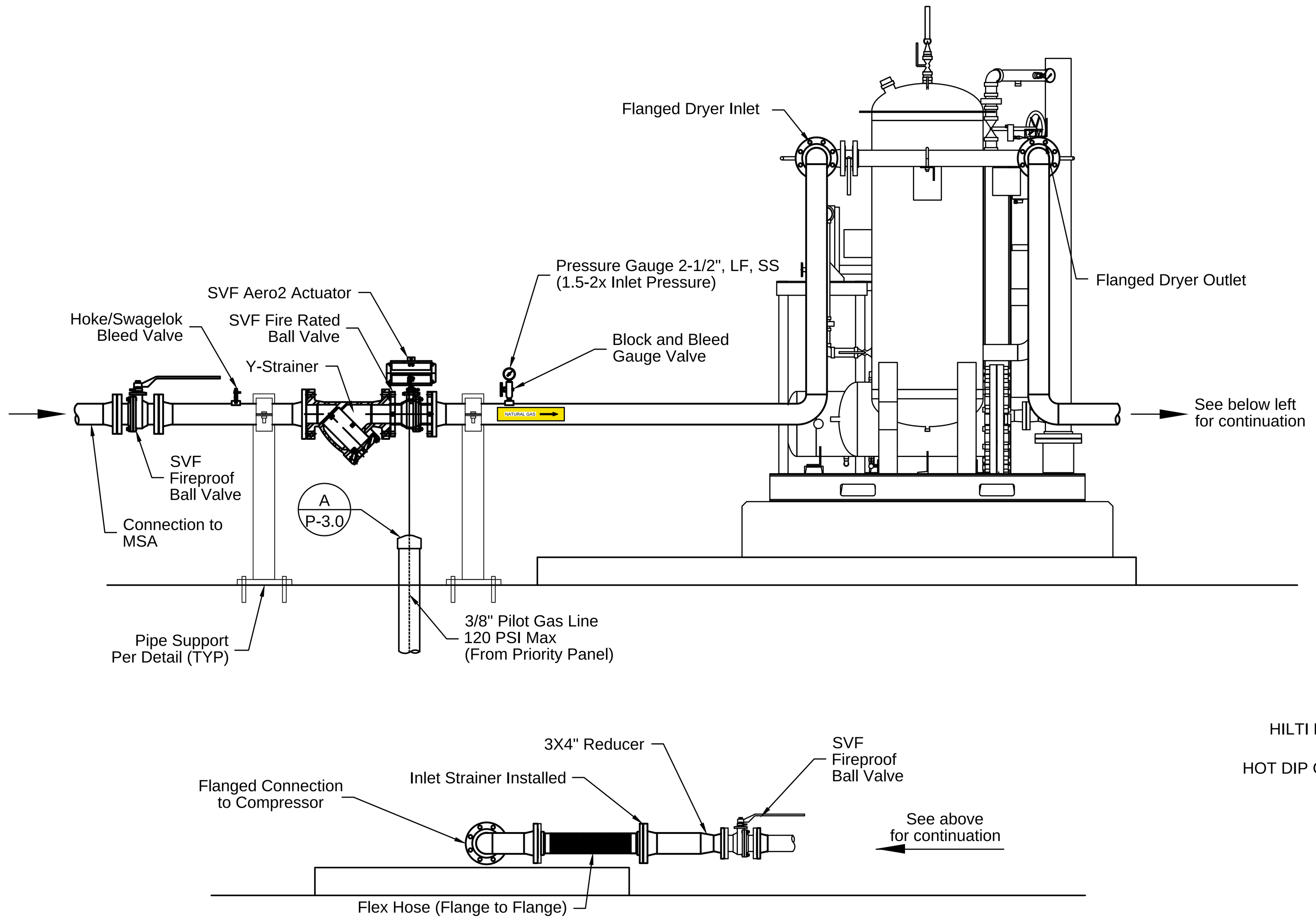
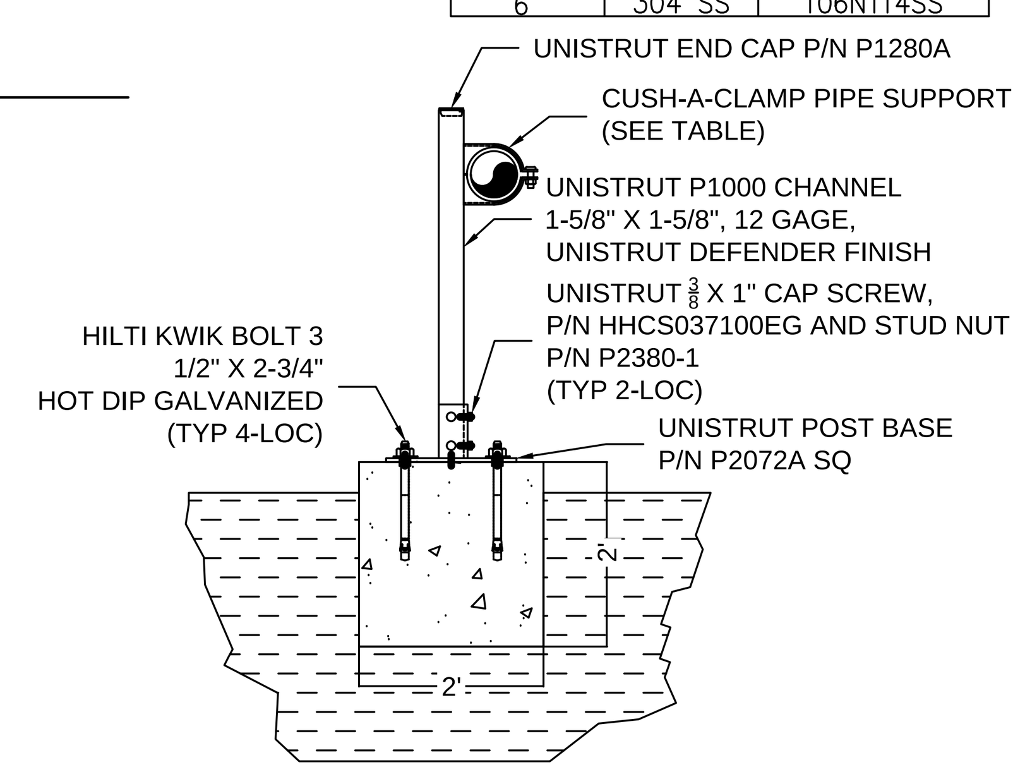


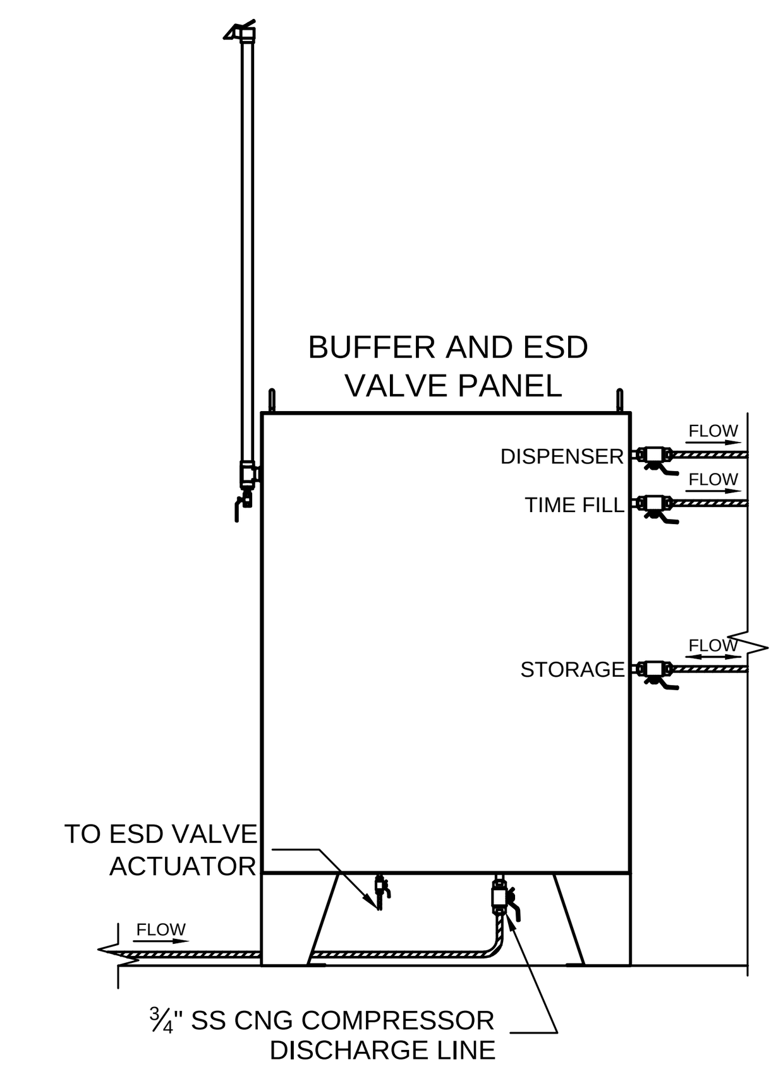
SCHEMATIC INLET PIPING DETAIL
A
P-2.0
N.T.S.

UNISTRUT "CUSH-A-CLAMP" PART NUMBERS

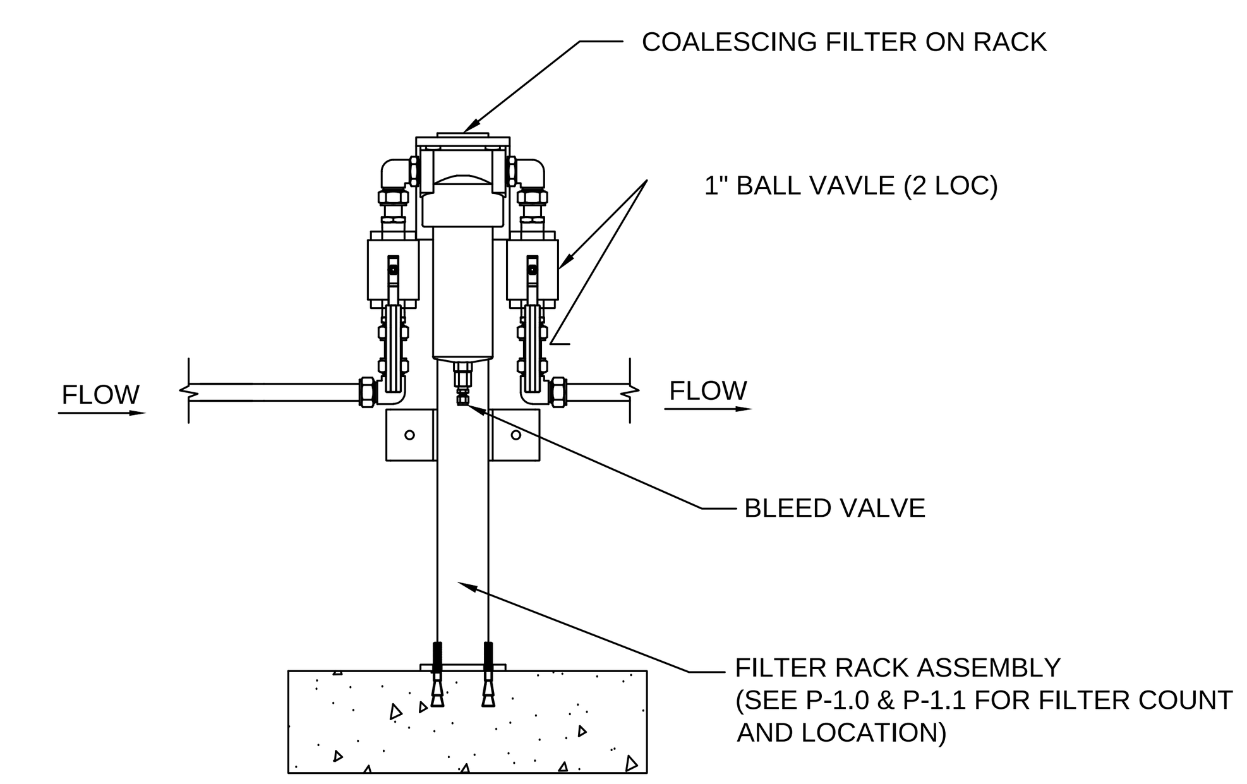
PIPE SIZE [NPS]	MATERIAL	PART NO.
3"	304 SS	056N062SS
4"	304 SS	072N080SS
6"	304 SS	106N114SS



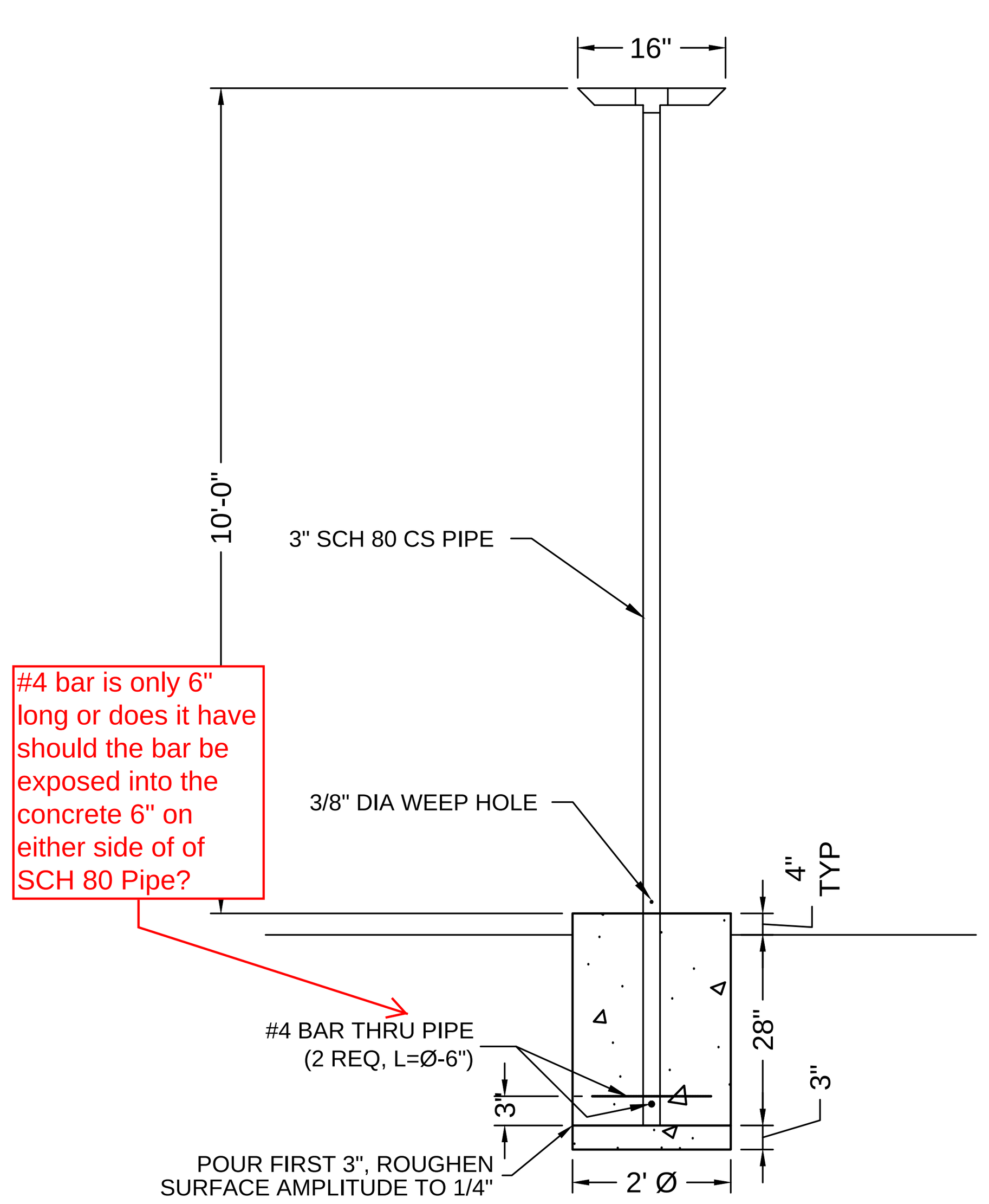
PIPE SUPPORT AND FOUNDATION



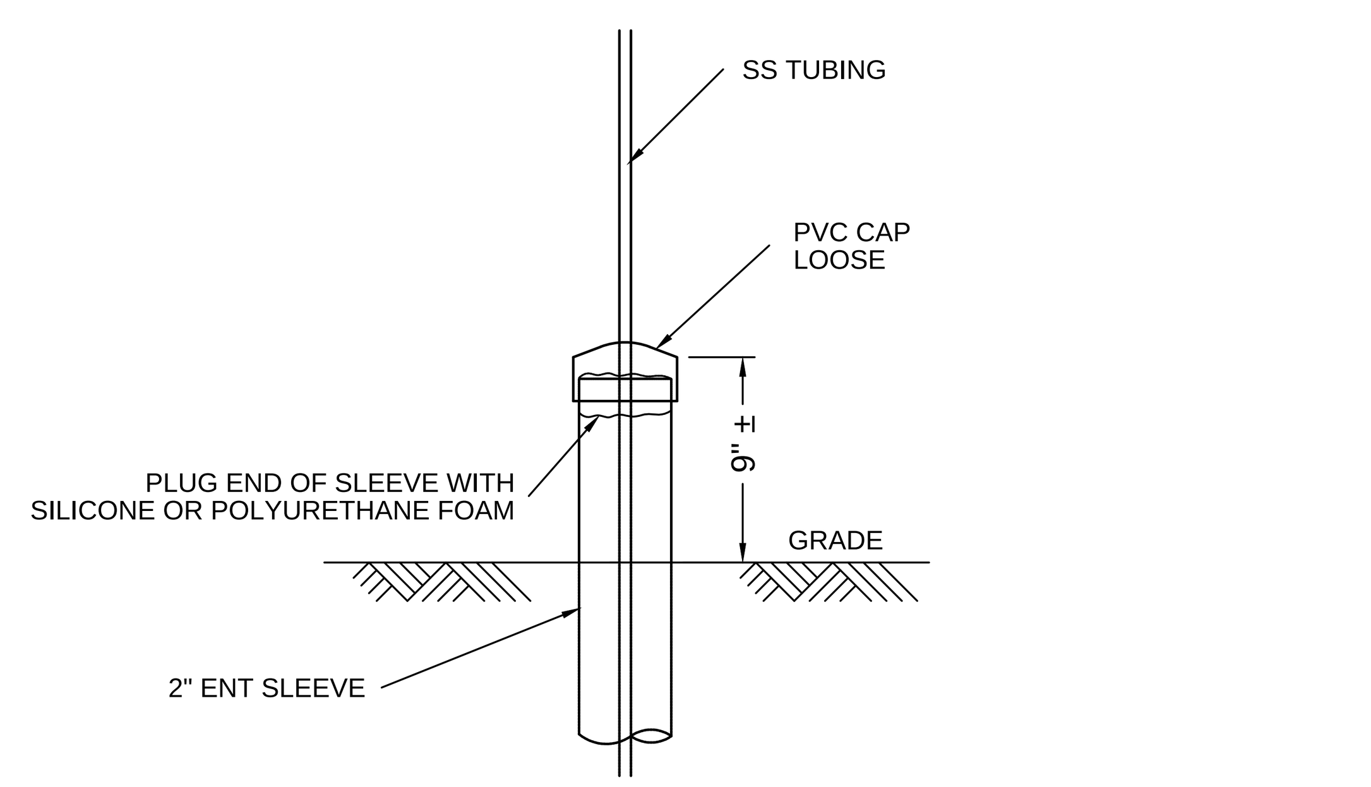
VALVE PANEL CONNECTION(S)
B
P-2.0
N.T.S.



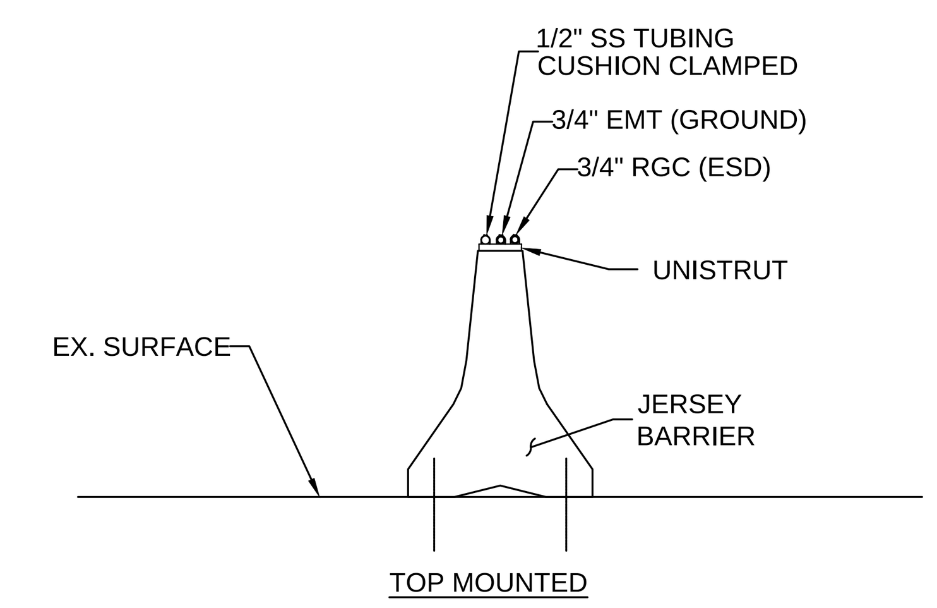
COALESCING FILTER CONNECTION(S)
C
P-2.0
N.T.S.



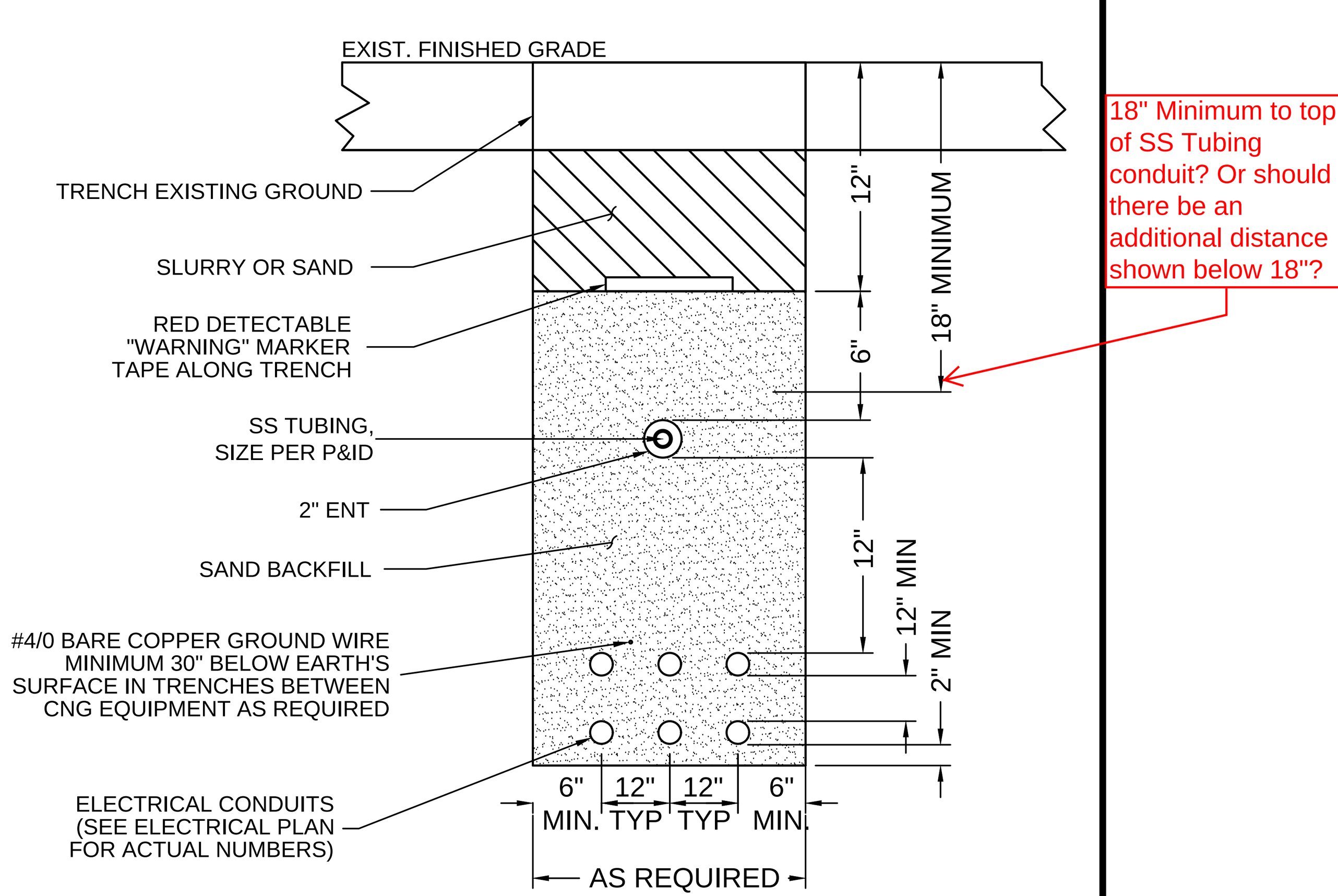
VENT STACK
D
P-2.0
N.T.S.



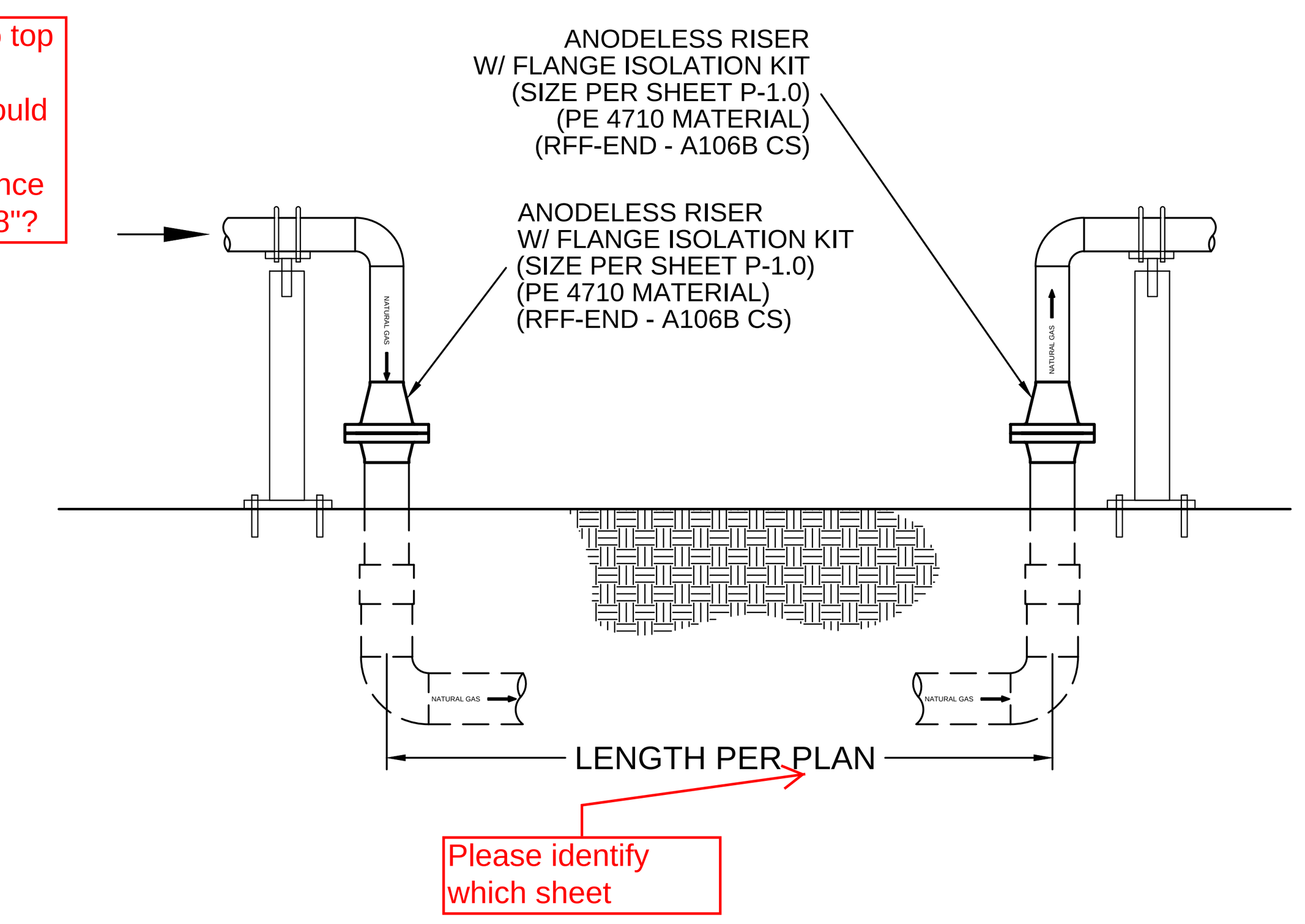
TYPICAL SLEEVE TRANSITION
E
P-2.0
N.T.S.



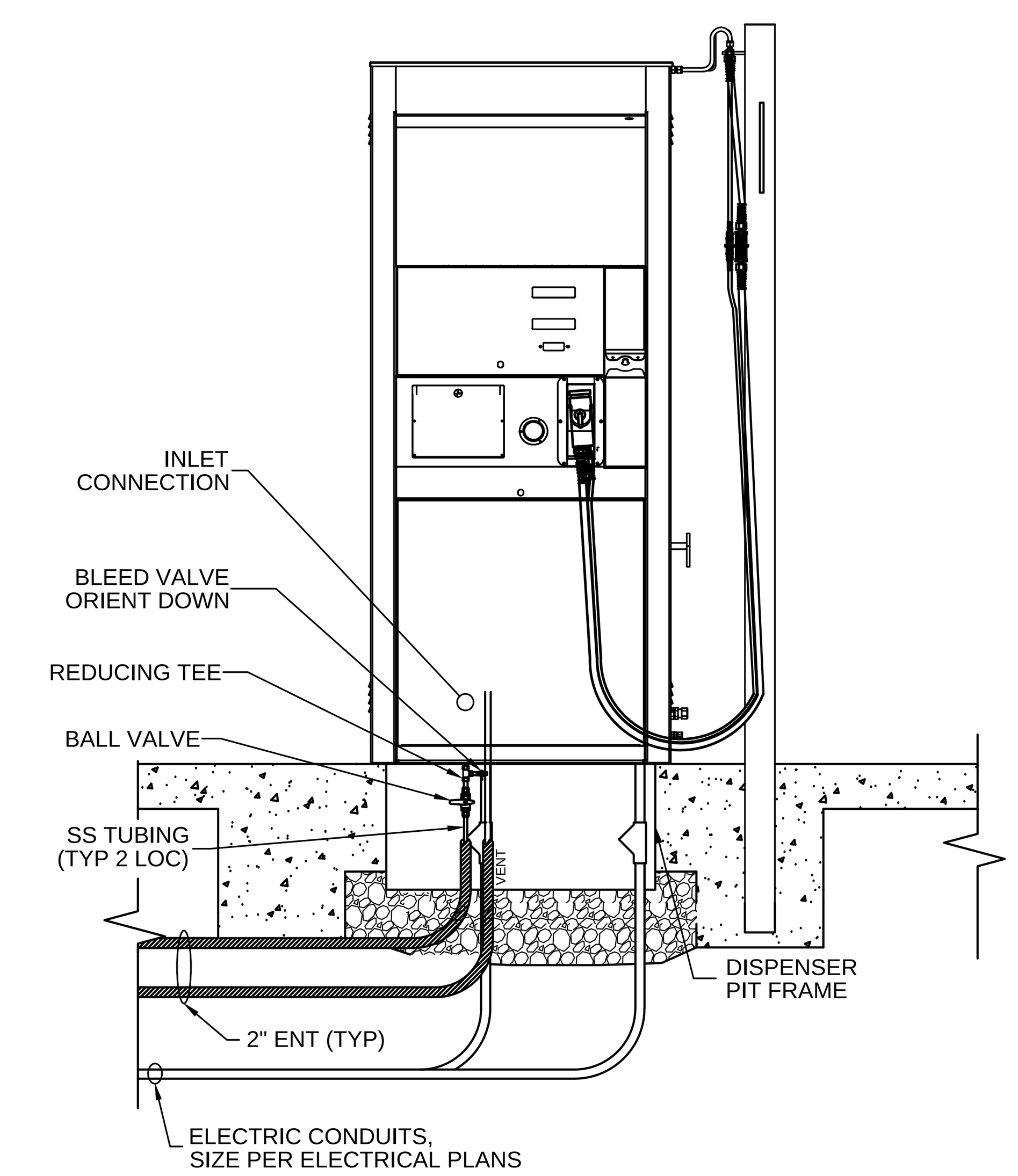
PIPING SUPPORT ON BARRIER
F
P-2.0
N.T.S.



TYPICAL TRENCH
H
P-2.0
N.T.S.



DETAIL OF ANODELESS RISER
K
P-2.0
N.T.S.



DISPENSER ELEVATION
G
P-2.0
FRONT VIEW SHOWN N.T.S.

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0047005
PROFESSIONAL ENGINEER
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PIPING SECTIONS AND DETAILS

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AT THE SHOWN LOCATION, THE INLET GAS FOR THE (N) STATION WILL BE CONNECTED BY REPLACING THE (E) PIPING SPOOL WITH A SPOOL THAT HAS A TEE FOR THE NEW CONNECTION. A WELDOLET FOR THE (E) PRESSURE GAUGE SHALL BE ADDED AS WELL.

THE BIO GAS PRESSURE WILL BE MONITORED BY ADDING A PRESSURE TRANSDUCER TO THE SHOWN LOCATION

INLET GAS CONNECTION K P-2.0

N.T.S.

THE CNG LINE INTERCONNECTING THE CNG STATIONS WILL BE CONNECTED AT THE (E) TUBING TEE

CNG GAS CONNECTION L P-2.0

N.T.S.

EXP. DATE: 10/31/2017

COLORADO LICENSED PROFESSIONAL ENGINEER RICHARD L. REMILLARD 0047005

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SHEET P-3.1

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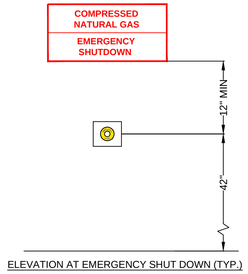
SIGN #	SYMBOL	SIGN SPECIFICATION
A	DANGER THIS EQUIPMENT STARTS AUTOMATICALLY	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: 10" X 14" X 1/8", ALUMINUM FASTENED WITH SCREWS OR STRAPS. GRAINGER ITEM#: 4T689, 1M158,1M374, 1K911 CODE REFERENCE: CAGI B19.1-2010 LOCATION: CNG EQUIPMENT COMPOUND ENTRANCES
B	GAS SHUTOFF VALVE	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: METAL TAG WITH RED BACKGROUND AND 1" WHITE LETTERING. CODE REFERENCE: 2000 UPC 1212.4, 2001 CPC LOCATION: TIED TO BODY OF BLOCK VALVE (BV) IMMEDIATELY DOWNSTREAM OF METER SET ASSEMBLY (MSA).
C	COMPRESSED NATURAL GAS EMERGENCY SHUTDOWN	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: 14" X 10" X 1/8" THICK ALUMINUM, ROUNDED CORNERS FASTENED WITH SCREWS OR STRAPS, 2" HIGH RED LETTERS WITH WHITE BACKGROUND. CODE REFERENCE: NFPA 52 SECTION 7.11.5.2 LOCATION: ABOVE EACH ESD
D	FIRE EXTINGUISHER	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: 14" X 3.5" X 1/8" METAL DECAL, FASTENED WITH SCREWS OR STRAPS, 0.875" HIGH RED LETTERS WITH WHITE BACKGROUND. GRAINGER ITEM#: 4FP26 LOCATION: ABOVE EACH FIRE EXTINGUISHER / ESD POST
E	STOP MOTOR NO SMOKING FLAMMABLE GAS NATURAL GAS VEHICLE FUEL CYLINDERS SHALL BE INSPECTED AT INTERVALS NOT EXCEEDING 3 YEARS TO ENSURE SAFE OPERATION OF THE VEHICLE. NATURAL GAS FUEL CYLINDERS PAST THEIR END OF LIFE DATE SHALL NOT BE REFUELED AND SHALL BE REMOVED FROM SERVICE	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: 20"W X 20"H ON 1/8" THICK SHEET METAL, ROUNDED CORNERS FASTENED WITH SCREWS OR STRAPS, RED LETTERS WITH WHITE BACKGROUND. CODE REFERENCE: NFPA 52 SECTION 7.14.12 LOCATION: AT DISPENSING POINTS
F	4 / 1 0 / CNG	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: 11" X 11" X 1/8" THICK FIBERGLASS, FASTENED WITH SCREWS, BLACK CHARACTERS WITH NFPA HAZARD WITH WHITE DIAMOND BACKGROUND. GRAINGER ITEM#:5AZ67 COLOR CODE: GRAINGER ITEM# SIZE 1 - BLUE 5AX79 4" 4 - RED AD851 4" 0 - YELLOW 5AH22 4" CNG- WHITE "C"-4T746 2" "N"-4T757 2" "G"-4T750 2" CODE REFERENCE: NFPA 704 SECTION 4.2.3.3 LOCATION: OUTSIDE FENCE FACING STREET / VISIBLE SIDES OF STORAGE VESSEL(S)
G	NO SMOKING FLAMMABLE GAS	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: MIN. 2" ADHESIVE LETTERING, BLACK LETTERS WITH WHITE BACKGROUND CODE REFERENCE: NFPA 52 SECTION 7.14.12.1, 2010 CFC 2703.7.1 LOCATION: ON STORAGE VESSEL(S)
H	CAUTION HEARING PROTECTION MUST BE WORN IN THIS AREA	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: SAFETY SIGN 10" X 14" SIZE ROUNDED CORNERS FASTENED WITH SCREWS OR STRAPS, GRAINGER ITEM#: 4T661, 1M112, 1M328, 1K991 LOCATION: CNG EQUIPMENT COMPOUND ENTRANCES
J	CAUTION EYE PROTECTION REQUIRED	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: SAFETY SIGN 10" X 14" SIZE ROUNDED CORNERS FASTENED WITH SCREWS OR STRAPS, GRAINGER ITEM#: 4T648, 1M244, 1M460, 1M016 LOCATION: CNG EQUIPMENT COMPOUND ENTRANCES
K	NOTICE AUTHORIZED PERSONNEL ONLY	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: SAFETY SIGN, 10" X 14" ROUNDED CORNERS FASTENED WITH SCREWS OR STRAPS, GRAINGER ITEM#: 4T633, 1M276, 1M492, 1M054 LOCATION: CNG EQUIPMENT COMPOUND ENTRANCES

SIGN #	SYMBOL	SIGN SPECIFICATION
L	DANGER NO SMOKING NO OPEN FLAMES NO SPARKS	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: SAFETY SIGN, SIZE 10" X 14" ROUNDED CORNERS FASTENED WITH SCREWS OR STRAPS, GRAINGER ITEM#: 4T678, 1M152, 1M368, 1K905 LOCATION: CNG EQUIPMENT COMPOUND ENTRANCES
M	THIS AREA IS UNDER 24 HOUR TV SURVELLANCE TRESPASSERS WILL BE PROSECUTED	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: SECURITY SIGN SIZE 10" X 14" MATERIAL, 65 MIL THICK. 0.875" HIGH LETTERING BLACK LEGEND COLOR, WHITE BACKGROUND, FOUR MOUNTING HOLES. GRAINGER ITEM#: 3JE44 LOCATION: DRIVEWAY
N	For station or fueling problems contact: Clean Energy 1-866-278-3674* *Operator will ask for station name and number: Mission Chevron 70-001	QTY: SUPPLIED BY: CLEAN ENERGY MATERIAL: 12" X 18" X 1/8", ALUMINUM FASTENED WITH SCREWS OR STRAPS. LOREN ELECTRIC SIGNS ITEM#: CLEN-AP-00034 LOCATION: CNG COMPOUND ENTRANCES / CNG DISPENSER AREA FOR FAST FILL ONLY
P	EMERGENCY STOP	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: GRAINGER ITEM #2LCC3 LEGEND PLATE, EMERGENCY STOP, BLACK/YELLOW LOCATION: ESD PUSH BUTTONS
Q	IN CASE OF FIRE, SPILL OR RELEASE: 1. Use Emergency Pump Shutoff ! 2. Report the Accident ! Clean Energy Telephone No.: 1-866-278-3674 Fire Department Telephone No.: _____ Facility Address: _____	QTY: SUPPLIED BY: CONTRACTOR MATERIAL: 18"W X 12"H ON 1/8" THICK SHEET METAL, ROUNDED CORNERS FASTENED WITH SCREWS OR STRAPS, RED LETTERS WITH WHITE BACKGROUND. LOCATION: ON CANOPY COLUMN / CNG EQUIPMENT COMPOUND ESD BUTTON(S)
R	NATURAL GAS	QTY: SUPPLIED BY:CONTRACTOR ASME A13.1 MATERIAL: ADHESIVE PIPE LABEL TAPE BLACK LETTERING, SIZE PER ASME A13.1 TABLE 3 SAFETY YELLOW BACKGROUND VENDOR: GRAINGER 4T609/4T561 <2"0 PIPE LOCATION: GAS PIPING, 20' OC MAX
S	EXIT	QTY: SUPPLIED BY:CONTRACTOR MATERIAL: POLYCARBONATE SHIELD WITH WHITE THERMOPLASTIC FRAME SELF LUMINOUS 6" WHITE LETTERING WITH 3/4" STROKE RED BACKGROUND LOCATION: INSIDE 3' GATES (TEXAS ONLY)

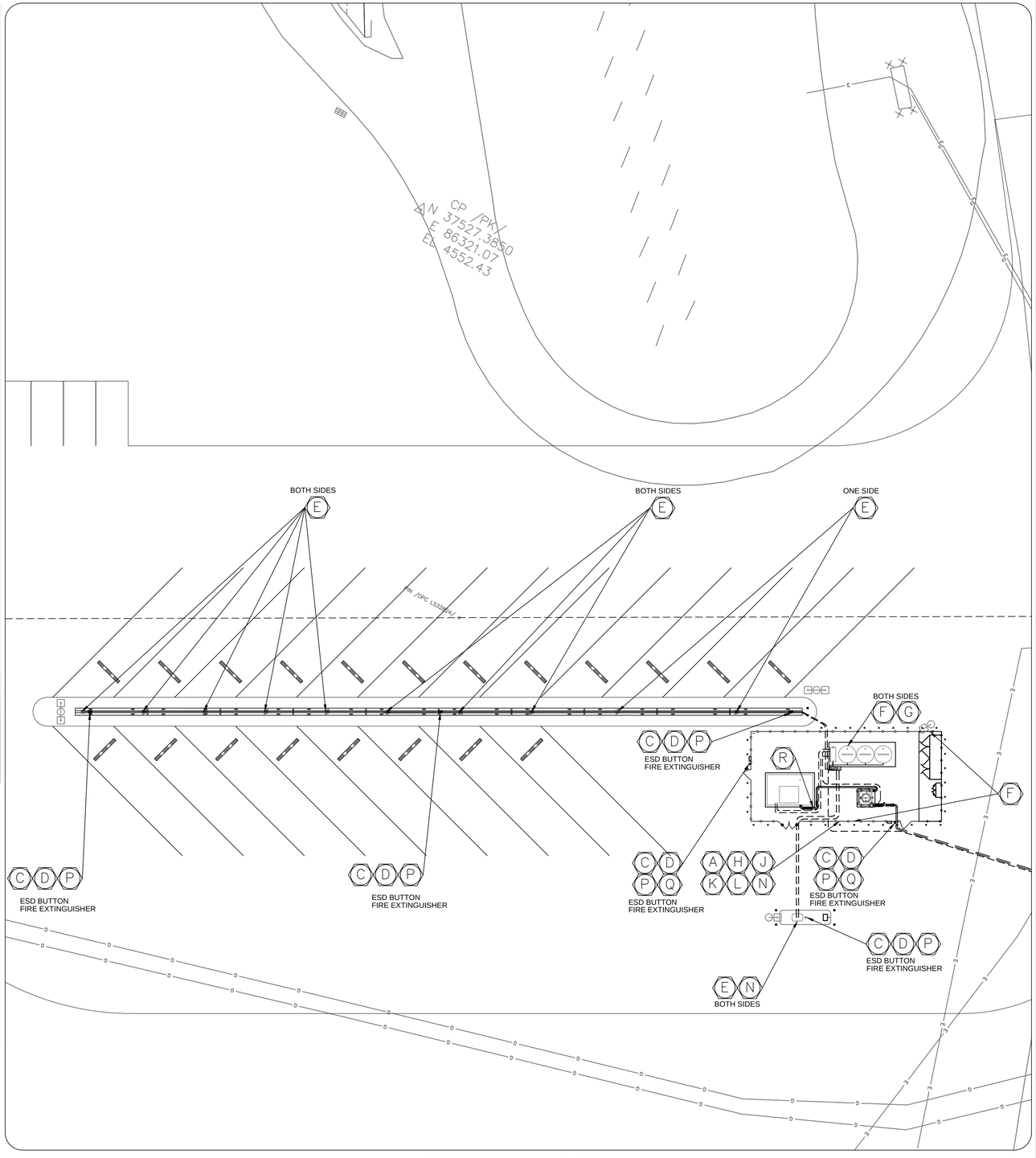
SIGNAGE NOTES

1. ALL SIGNS SHALL BE IN ACCORDANCE WITH OSHA SPECIFICATIONS 1910.145 AND ANSI SPECIFICATION Z535.
2. ALL SIGNS SHALL BE SUITABLE FOR OUTDOOR USE.
3. SIGNS SHALL BE MADE OF 0.08 INCH THICK ALUMINUM WITH BAKED ENAMEL BACKGROUND UNLESS OTHERWISE NOTED. LETTERS SHALL BE BAKED ENAMEL OR 3M WEATHERIZED VINYL - SIZE, COLOR AND FONT AS NOTED.
4. VENDORS LISTED ARE FOR ESTABLISHING STANDARDS OF QUALITY AND PERFORMANCE. OTHER MANUFACTURERS MAY BE SUBSTITUTED UPON APPROVAL.
5. CONTRACTOR SHALL PROVIDE AND INSTALL SIGNAGE AS SHOWN ON THE DRAWINGS. IN ADDITION, CONTRACTOR SHALL TAG ALL EQUIPMENT AND VALVES AND SHALL LABEL ALL LINES IN ACCORDANCE WITH ANSI A13.1-1987.
6. SIGNS SHALL BE PROVIDED AND INSTALLED WITH NECESSARY BRACKETS, SUPPORTS AND HARDWARE. BRACKETS, SUPPORTS AND HARDWARE SHALL BE GALVANIZED. ALL HARDWARE SHALL BE VANDAL AND TAMPER RESISTANT.
7. WHERE SIGNAGE IS TO BE ATTACHED TO EXTERIOR SURFACE OF EQUIPMENT, SUCH AS COMPRESSOR ENCLOSURE OR DISPENSER FRONT PANEL, SIGN MATERIAL SHALL BE SELF ADHESIVE VINYL.
8. SIGNS SHALL BE LOCATED FOR EASY VISIBILITY FROM ALL SIDES.



ELEVATION AT EMERGENCY SHUT DOWN (TYP.)

ELEVATION AT EQUIPMENT AREA (TYP.)



SIGNAGE PLAN (1" =16')

16' 8' 0' 16' 32'

GRAPHIC SCALE

EXP. DATE: 10/31/2017

COLORADO LICENSED
RICHARD L. REMILLARD
0047005
PROFESSIONAL ENGINEER

DATE SIGNED:

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

DIGALERT®
Know what's **below. CALL 811** before you dig
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CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
SAFETY SIGNAGE

ASSET NO: 160-11-17307.02.00

DATE	DESIGNED BY HVT
05/01/2017	CHECKED BY MES
	APPROVED BY RLR

SCALE: AS NOTED

SHEET: P-4.0

W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.0)\0.0 Drawings and Engineering\012-P04-SAFETY SIGNAGE.dwg - PLOTTED: May 12, 2017 - 1:29pm

PART 4 - ELECTRICAL

4.1 GENERAL

A. ELECTRICAL EQUIPMENT, MATERIALS, WORKMANSHIP AND TESTING SHALL BE PROVIDED OR PERFORMED AS DESCRIBED HEREIN. WORK COVERED BY THESE SPECIFICATIONS INCUDES THE FOLLOWING:

1. INSTALLATION OF A NEW 480 VOLT SWITCHBOARD(S).
2. INSTALLATION OF INSTRUMENTATION, CONDUIT AND WIRE AS SHOWN ON THE DRAWINGS.
3. INSTALLATION OF EQUIPMENT GROUNDING SYSTEM AS SHOWN ON THE DRAWINGS.
4. INSTALLATION OF POWER AND LIGHTING CONDUITS AND WIRE AS REQUIRED FOR THIS PROJECT.

B. DRAWINGS: THE CONTRACTOR SHALL PROVIDE ALL ELECTRICAL EQUIPMENT AND INCIDENTALS, UNLESS NOTED OTHERWISE, AS NEEDED TO COMPLETE THE WORK INDICATED IN THE SPECIFICATIONS AND DESIGN DRAWINGS.

C. CODES

1. MATERIALS, EQUIPMENT, AND INSTALLATION PROVIDED AND PERFORMED UNDER THIS SECTION SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE FOLLOWING CODES:

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70, NEC
NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
NFPA 52 - VEHICULAR GASEOUS FUEL SYSTEM CODE.
LOCAL CODES AND REGULATIONS.

2. IN CASE OF DIFFERENCES AMONG BUILDING CODES, SPECIFICATIONS, STATE AND FEDERAL LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS AND ELECTRICAL DEPARTMENT REGULATIONS AND THE CONTRACT DRAWINGS, THE MOST STRINGENT SHALL GOVERN. THE CONTRACTOR SHALL PROMPTLY NOTIFY CLEAN ENERGY IN WRITING UPON DISCOVERY OF ANY SUCH DIFFERENCES.

4.2. WORKMANSHIP

A. ALL CABLES, CONDUITS, PIPING OR EQUIPMENT LOCATIONS AND ELEVATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD CHECKING AND MAKING ALL NECESSARY OFFSETS, AS REQUIRED TO AVOID EXISTING INTERFERENCES AND TO COORDINATE WITH OTHER TRADES.

B. THE DRAWINGS OR SPECIFICATIONS ARE NOT INTENDED TO ALLOW A VIOLATION OF ELECTRICAL WORKING SPACE AROUND ELECTRICAL EQUIPMENT. A 30"W MIN x 48"D x 6'-6"H SPACE SHALL BE CLEAR TO THE FLOOR IN FRONT OF ALL ELECTRICAL PANELS, CONTROLS OR ITEMS THAT REQUIRE MAINTENANCE OR ACCESS WHILE ENERGIZED. ANY DEVIATION FROM THIS MINIMUM SHALL BE APPROVED IN WRITING BY THE ENGINEER.

C. THE ELECTRICAL DESIGN IS BASED ON TYPICAL VENDOR EQUIPMENT. THE CONTRACTOR SHALL COORDINATE EQUIPMENT INSTALLATION WITH THE ACTUAL EQUIPMENT FURNISHED.

D. THE CONTRACTOR SHALL PROVIDE ALL FUSES REQUIRED FOR PROJECT POWER, INCLUDING ANY FUSES BLOWN DURING INITIAL TESTING.

E. BONDING JUMPERS SHALL BE INSTALLED TO INSURE CONTINUITY WHERE CONDUIT CONNECTIONS AT CONCENTRIC KNOCKOUTS ARE TO SERVE AS A GROUND.

F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL WALLS, FLOORS AND PAVING CAUSED BY CONTRACTOR. CONTRACTOR SHALL COORDINATE WITH CLEAN ENERGY TO PATCH, PAINT AND REPAIR TO MATCH EXISTING CONDITIONS.

G. NOTHING IN THESE DRAWINGS AND SPECIFICATIONS SHALL BE CONSTRUED AS ALLOWING WORK THAT VIOLATES GOVERNING CODES. THIS SHALL NOT BE CONSTRUED AS RELIEVING THE CONTRACTOR FROM COMPLYING WITH ANY REQUIREMENTS OF THE PLANS OR SPECIFICATIONS WHICH MAY COMPLY WITH, BUT EXCEED THOSE OF GOVERNING CODES.

H. SHOULD ANY DEVIATIONS FROM WORK INDICATED ON THE DRAWINGS OR DESCRIBED IN SPECIFICATIONS BE NECESSARY IN ORDER TO MEET CONDITIONS AT THE SITE, THEY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BID OR IMMEDIATELY IN WRITING FOR APPROVAL OF THE DEVIATION REQUESTED.

4.3 MATERIALS

A. GENERAL

1. ALL MATERIALS SHOWN ON THE DRAWING PLANS AND DETAILS ARE THE MAIN ITEMS OF CONSTRUCTION AND ARE NOT TO BE CONSTRUED AS ALL-INCLUSIVE. THE CONTRACTOR SHALL MAKE COMPLETE ALL ELECTRICAL INSTALLATIONS IN A NEAT, PROFESSIONAL, AND WORKMAN-LIKE MANNER.

2. THESE DESIGN DRAWINGS ARE SCHEMATIC AND DO NOT SHOW ALL OFFSETS, BENDS, ELBOWS, OR OTHER SPECIFIC ELEMENTS WHICH MAY BE NEEDED FOR PROPER INSTALLATION. EXCEPT WHERE SHOWN IN DIMENSIONAL DETAIL, THE LOCATIONS OF SWITCHES, RECEPTACLES, LIGHTS, MOTORS, OUTLETS, AND OTHER EQUIPMENT ON PLANS ARE APPROXIMATE. SUCH ITEMS SHALL BE PLACED SO AS TO ELIMINATE INTERFERENCE WITH DUCTS, PIPING, AND EQUIPMENT. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD.

3. EQUIPMENT SIZES SHOWN ON THE DRAWINGS ARE MINIMUM UNLESS OTHERWISE INDICATED. BEFORE INSTALLING ANY WIRE OR CONDUIT, THE CONTRACTOR SHALL OBTAIN THE EXACT EQUIPMENT REQUIREMENTS AND SHALL INSTALL WIRE, CONDUIT, DISCONNECT SWITCHES, MOTOR STARTERS, HEATERS, CIRCUIT BREAKERS, AND OTHER ITEMS OF THE CORRECT SIZE FOR THE EQUIPMENT ACTUALLY INSTALLED. HOWEVER, WIRE AND CONDUIT SIZES SHOWN ON THE DRAWINGS SHALL BE TAKEN AS A MINIMUM AND SHALL NOT BE REDUCED WITHOUT WRITTEN APPROVAL.

4. ELECTRICAL AND INSTRUMENTATION MATERIALS AND EQUIPMENT SHALL CONFORM TO THE REQUIREMENTS OF UNDERWRITERS LABORATORIES (UL) AND BE LISTED AND LABELED FOR THE INTENDED APPLICATION.

5. MATERIALS AND EQUIPMENT FURNISHED BY THE THE CONTRACTOR SHALL BE NEW, AND BE IN COMPLIANCE WITH THESE SPECIFICATIONS. MATERIALS AND EQUIPMENT SHALL BE PRODUCTS THAT HAVE BEEN IN SATISFACTORY COMMERCIAL OR INDUSTRIAL USE AT LEAST TWO YEARS PRIOR TO AWARD OF CONTRACT.

6. ALL CONDUIT, CONDUIT FITTINGS, AND ENCLOSURES SHALL BE PROPERLY PROTECTED FROM ANY MOISTURE DURING STORAGE. THE CONTRACTOR SHALL ENSURE THAT AT THE TIME OF USE, THE MATERIALS ARE CLEAN, DRY AND SUITABLE FOR THEIR INTENDED USE.

7. MAIN CIRCUIT BREAKERS FEEDING SYSTEMS RATED 1000 AMPS AND ABOVE SHALL INCLUDE GROUND FAULT (GFI) PROTECTION.

8. MAIN SWITCHBOARD SHALL BE NEMA 3R, WITH AN INTERRUPTING CAPACITY OF 65KAIC, FULLY RATED. ROOF OF SWITCHBOARD SHALL SLOPE AWAY FROM THE SWITCHBOARD'S FRONT.

9. ELECTRICAL EQUIPMENT SHALL BE LISTED BY AN ELECTRICAL TESTING LABORATORY ACCEPTED BY THE AHJ.

B. CABLE AND WIRE

1. CABLE AND WIRE FOR POWER AND CONTROL CIRCUITS AT 600 VOLTS AND BELOW SHALL BE 600 VOLT COPPER, TYPE THWN-2. WIRE SIZES #12 AWG AND SMALLER MAY BE SOLID OR STRANDED; ALL LARGER SIZES SHALL BE STRANDED.

2. IF ALLOWED BY THE ELECTRIC UTILITY COMPANY, ALUMINUM CONDUCTORS MAY BE USED FOR THE MAIN UTILITY FEEDER. CONTRACTOR SHALL SUBMIT WIRE DATA AND CALCULATIONS FOR APPROVAL BY THE ENGINEER.

3. GROUND WIRE SHALL BE MEDIUM DRAWN BARE STRANDED COPPER . ALL GROUND CONNECTIONS AND FITTINGS SHALL BE CAST OR FORGED COPPER ALLOY BODY.

4. INSTRUMENT WIRING SHALL BE AS CALLED FOR ON THE PLANS.

C. GROUNDING

A MINIMUM OF (5) 3/4 INCH DIAMETER BY 10 FOOT LONG COPPER CLAD STEEL GROUND RODS SHALL BE INSTALLED. GROUNDING RODS SHALL NOT BE LESS THAN 1.8M (6 FT) APART. CONNECTIONS TO GROUND RODS AND THE MAIN GROUND GRID SHALL BE MADE WITH BURNDY "HYGROUND" IRREVERSIBLE COMPRESSION CONNECTORS. CONNECTIONS TO EQUIPMENT SHALL BE MADE WITH COPPER OR BRONZE SPLIT BOLT CONNECTORS. SPLIT BOLT CONNECTORS SHALL BE ATTACHED TO EQUIPMENT STRUCTURE THAT HAS BEEN STEEL-BRUSHED TO BRIGHTNESS AND LUBRICATED WITH AN ELECTRICALLY CONDUCTING COMPOUND MADE FOR THAT PURPOSE. WIRE SIZES WILL BE AS CALLED FOR ON THE DRAWINGS.

D. CONDUIT

1. ABOVEGROUND CONDUIT FOR POWER CONDUCTORS IN PERMANENTLY INSTALLED NON-FLEXING SERVICE SHALL BE THREADED RIGID METAL CONDUIT (RMC) OR THREADED STEEL INTERMEDIATE CONDUIT (IMC). UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC, UNLESS NOTED OTHERWISE IN THE DRAWINGS.

2. UNDERGROUND PVC CONDUIT SHALL BE EQUIPPED WITH RMC RISERS EXCEPT WHERE ENTERING A PANEL OR SWITCHGEAR.

2. FLEXIBLE CONDUIT SHALL BE STEEL LIQUID-TIGHT WITH A PVC JACKET SUITABLE FOR THE AREA CLASSIFICATION IN WHICH IT IS TO BE INSTALLED.

3. CONDUIT INSTALLED WITHIN CLASSIFIED AREAS SHALL BE THREADED IMC OR RMC. PROVIDE CONDUIT SEALS WHERE CONDUIT CROSSES BOUNDARIES OF HAZARDOUS AREAS, OR AS OTHERWISE REQUIRED BY CODE.

E. CONDUIT FITTINGS

1. STANDARD FITTINGS WITH COVERS SHALL HAVE GASKETS AND NON-CORRODING ATTACHING SCREWS WHERE BURIED. CONDUIT FITTINGS SHALL BE PVC COATED AND MADE OF NON-CORRODING FERROUS ALLOY.

2. CONDUIT BUSHINGS ON RISERS INTO SWITCHGEAR SHALL BE INSULATING TYPE.

F. CABLE AND WIRE TERMINATIONS

1. ALL POWER CABLE SHALL BE TERMINATED WITH COMPRESSION LUGS OR MECHANICAL LUGS .

2. CONTROL, ALARM AND SIGNAL WIRE SHALL BE TERMINATED WITH COMPRESSION SPADE OR RING LUGS WHERE SCREW TERMINALS ARE PROVIDED. SOLDER CONNECTIONS ARE NOT ALLOWED.

3. CABLES AND CONDUCTORS SHALL BE CONTINUOUS BETWEEN TERMINALS, AND NOT JOINED BY SPLICES OR WIRE NUTS, EXCEPT AS NECESSARY TO CONNECT TWO OR MORE WIRING BRANCHES TOGETHER IN A JUNCTION BOX.

G. ENCLOSURES

1. ENCLOSURES FOR EQUIPMENT AND DEVICES SHALL BE UL LISTED, NEMA 3R OR NEMA4 IN NON-HAZARDOUS AREAS, AND NEMA 7 IN CLASS 1 , DIV 1 OR DIV 2 AREAS.

2. ENCLOSURES IN NON-HAZARDOUS AREAS SHALL BE PROVIDED WITH WATER TIGHT CONDUIT HUBS ON TOP AND VERTICAL SURFACES. GASKETS AND O-RINGS SHALL BE INSTALLED AS INSTRUCTED BY MANUFACTURER, TO MAINTAIN WEATHER TIGHTNESS.

3. PULL BOXES AND JUNCTION BOXES SHALL BE UL LISTED FOR NEMA 3R IN NON-HAZARDOUS AREAS, AND NEMA 7 IN CLASS 1, DIV 1 EXTERIOR AREAS. ALL PULL BOXES INSTALLED WHEREVER TRAFFIC MIGHT COME IN CONTACT SHALL BE TRAFFIC RATED. ALL IN-GROUND PULL BOXES SHALL BE EQUIPPED WITH LOCK DOWN DEVICES.

H. EQUIPMENT MOUNTING

1. EQUIPMENT SHALL BE SECURED WITH CORROSION-PROOF BOLTS, STRAPS, HANGERS, AND SUCH OTHER HARDWARE AND DEVICES AS ARE NECESSARY OR APPROPRIATE.

I. SPECIALTY EQUIPMENT

1. ESD PUSH BUTTONS: BUTTONS SHALL BE MAINTAINED PUSH-PULL TYPE WITH LARGE, RED, MUSHROOM HEAD PUSH BUTTON THAT IS NORMALLY CLOSED. ESD SHOULD HAVE ELECTRICAL CLASSIFICATION APPROPRIATE TO THE HAZARDOUS CLASSIFICATION OF THE LOCATION.

2. EMERGENCY PHONE: FURNISH EMERGENCY TELEPHONE(S) WHERE SHOWN IN THE DRAWINGS. FURNISH STANDARD INDUSTRIAL DIAL-OUT PHONE WITH WEATHER PROOF ENCLOSURE FOR OUTDOOR USE. CEE CO EMERGENCY TELEPHONE, PART NO. WPP-331-D-R.

4.4 INSTALLATION REQUIREMENTS

A. GENERAL

1. INSTALL THE SWITCHBOARD ON THE FOUNDATIONS AS INDICATED BY THESE DRAWINGS. INSTALL CONDUITS, WIRE, LIGHTING FIXTURES, GROUND GRID, ETC., AS SHOWN ON THE DRAWINGS.

B. GROUNDING

1. ALL EQUIPMENT GROUNDS SHOULD BE THROUGH SLAB, HIDDEN WHERE POSSIBLE AND PROTECTED BY PVC CONDUIT.

2. GROUNDING SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH NEC ARTICLE 250, PART III. SYSTEM GROUND SHALL CONSIST OF 4/0 BARE COPPER STRANDED WIRE GROUND RING 30" BELOW GRADE, ENCIRCLING THE EQUIPMENT COMPOUND WITH INTERCONNECTING RUNS BETWEEN MAJOR EQUIPMENT COMPONENTS. ALL WIRE TO WIRE CONNECTIONS SHALL BE MADE USING BURNDY "HYGROUND" IRREVERSIBLE COMPRESSION FITTINGS. A MINIMUM OF TWO GROUND RODS SHALL BE CONNECTED TO THE SYSTEM AT OPPOSITE SIDES OF THE EQUIPMENT AREA. ADDITIONAL GROUND RODS TO BE INSTALLED AS NECESSARY. GROUND RING TO BE EXTENDED TO FUELING AREAS AND OTHER EQUIPMENT AREAS REMOTE FROM EQUIPMENT COMPOUND, WITH GROUND RODS INSTALLED PER CLEAN ENERGY SPECIFICATIONS.

C. CONNECTIONS AND CONTROLS

1. THE CONTRACTOR SHALL WIRE ALL CONTROL DEVICES FURNISHED BY OTHERS IN ACCORDANCE WITH SCHEMATIC AND WIRING DIAGRAMS FURNISHED WITH THE EQUIPMENT, THIS SPECIFICATION, AND THE CONSTRUCTION DRAWINGS.

D. IDENTIFICATION AND LABELING

1. INSTALL NON-CORRODING METAL-STRIP CONDUIT TAGS WITH EMBOSSED CONDUIT NUMBERS AT END POINTS OF ALL CONDUITS, AND AT PENETRATIONS INTO SLABS, GROUND, AND THE EQUIPMENT, ATTACHED WITH DOUBLE METAL BANDS.

2. IDENTIFY EACH CONDUCTOR USING BRADY-TAGS PROTECTED BY HEAT-SHRINKABLE SLEEVES. CONDUCTORS SHALL BE MARKED WHEREVER THEY TERMINATE IN AN EQUIPMENT ENCLOSURE, AND SHALL BE MARKED WITH THE TERMINAL ID NO. PROVIDED IN THE EQUIPMENT MANUFACTURER'S SHOP DRAWING(S).

3. IDENTIFY EACH ITEM OF ELECTRICAL EQUIPMENT WITH A 1 INCH X 2.5 INCH ENGRAVED NAMEPLATE. THE LETTERING SHALL BE $^{3}/_{16}$ INCH HIGH, WITH BLACK TEXT ON A WHITE BACKGROUND.

4. ALL SPARE CONDUCTORS SHALL BE TAPED AT EACH END AND IDENTIFIED AS SPARE.

5. THE INSULATION OF A SINGLE-CONDUCTOR WIRE SHALL BE COLORED AS FOLLOWS:

120/208 VOLT CIRCUITS		CONTROL CIRCUITS		277/480 VOLT CIRCUITS	
WIRE	COLOR	WIRE	COLOR	WIRE	COLOR
NEUTRAL	WHITE	24VDC (+)	ORANGE	NEUTRAL	GRAY
PHASE A	BLACK	24VDC (-)	YELLOW	PHASE A	BROWN
PHASE B	RED	24VDC SIGNAL	BLUE	PHASE B	ORANGE
PHASE C	BLUE	120VAC SIGNAL	RED	PHASE C	YELLOW
GROUND	GREEN			GROUND	GREEN/YELLOW

FOR LARGE CONDUCTORS AVAILABLE ONLY WITH BLACK INSULATION, APPLY SUITABLY COLORED ELECTRICAL TAPE NEAR TERMINATIONS.

E. TESTING AND DEFICIENCIES

1. WHEN DEFICIENCIES ARE FOUND, THE DEFICIENCY SHALL BE CORRECTED AND THE TEST RE-RUN. THIS PROCEDURE SHALL BE REPEATED UNTIL THE DEFICIENCY IS CLEARED. TESTS SHALL BE PERFORMED BY QUALIFIED AND EXPERIENCED PERSONS.

2. ALL INSTALLATIONS AND WIRING SHALL BE THOROUGHLY TESTED TO DETERMINE PROPER POLARITY, PHASING, FREEDOM FROM SHORT CIRCUITS, FOR CONTINUITY AND OPERATION OF CONTRACTOR SUPPLIED EQUIPMENT, RELAYS, INSTRUMENTS, ETC. THE CONTRACTOR SHALL OPERATE ALL CIRCUIT BREAKERS, HAND SWITCHES AND PUSH BUTTONS BY HAND TO DEMONSTRATE PROPER MECHANICAL FUNCTION.

3.

4. COMPLETE TEST AND INSPECTION RECORDS SHALL BE MADE BY THE THE CONTRACTOR AND INCORPORATED INTO A REPORT, WHICH SHALL BE GIVEN TO THE CLEAN ENERGY. ALL READINGS TAKEN SHALL BE RECORDED.

5. ALL TESTS SHALL BE PERFORMED IN THE PRESENCE OF CLEAN ENERGY'S PROJECT MANAGER OR REPRESENTATIVE UNLESS INSTRU and Owner OTHERWISE.

6. AUTHORIZATION MUST BE OBTAINED FROM CLEAN ENERGY BEFORE ANY WORK IS DONE ON AN ENERGIZED CIRCUIT. THERE SHALL BE NO INTERRUPTION OF ENERGIZED CIRCUITS WITHOUT PRIOR AUTHORIZATION.

7. ALL CABLES AND EQUIPMENT INDICATED FOR 480V SERVICE, INCLUDING MOTORS AND TRANSFORMERS, SHALL BE TESTED FOR GROUND AND SHORTS BY MEANS OF A MEGGER INSULATION TESTING INSTRUMENT, WHICH SHALL IMPRESS A VOLTAGE OF NOT LESS THAN 500 VOLTS UPON THE CIRCUIT UNDER TEST.

8. WHERE TESTS INDICATE THAT INSULATION WAS DAMAGED BY HANDLING OR DURING INSTALLATION, NEW CABLE SHALL BE INSTALLED AT THE THE CONTRACTOR'S EXPENSE.

9. AFTER THE GROUNDING SYSTEM HAS BEEN INSTALLED, THE CONTRACTOR SHALL PERFORM THE FOLLOWING:

a. TESTS MUST BE COMPLETED AND THE GROUNDING SYSTEM APPROVED BEFORE GROUND RODS ARE COVERED.

10. ALL ABOVE GRADE CONNECTIONS SHALL BE ACCESSIBLE FOR INSPECTION AND TESTING. INTERLOCKING CONTROL AND INSTRUMENTATION WIRING FOR EACH SYSTEM AND/OR PART OF A SYSTEM SHALL BE CAREFULLY CHECKED TO ASCERTAIN THAT THE SYSTEM WILL FUNCTION PROPERLY AS INDICATED BY THE WIRING DIAGRAMS, SCHEMATIC DIAGRAMS, DESCRIPTION OF OPERATION, ETC.

11. CLEAN ENERGY PERSONNEL SHALL SET CIRCUIT BREAKERS AND RELAYS PROPERLY COORDINATED SO THAT EQUIPMENT WILL BE IN PROPER OPERATING CONDITION BEFORE BEING PLACED IN SERVICE.

12. UPON COMPLETION OF PRELIMINARY CHECKS, ALL EQUIPMENT SHALL BE TESTED FOR SATISFACTORY OPERATION. CLEAN ENERGY PERSONNEL SHALL START EQUIPMENT AS DIRECTED BY CLEAN ENERGY'S PROJECT MANAGER OR OTHER AUTHORIZED REPRESENTATIVE.

F. ENCLOSURES AND SUPPORTS

1. SUPPORTS AND ENCLOSURES SHALL BE PROVIDED FOR ALL CONTRACTOR FURNISHED EQUIPMENT.

2. BOLT ELECTRICAL EQUIPMENT TO RACKS, PLATES WELDED TO RACKS, PLATES WELDED OR BOLTED TO OTHER STRUCTURES, BUILDINGS, OR WHERE PERMITTED, TO EQUIPMENT. DO NOT WELD TO ELECTRICAL EQUIPMENT. PROVIDE BACKING PLATES WHERE EQUIPMENT IS ATTACHED TO METAL THAT IS LESS THAN 1/8" INCH THICK. CONDUIT BOXES UP TO 6 INCHES SQUARE MAY BE SUPPORTED IN CONDUIT RUNS WITHOUT ADDITIONAL SUPPORT; HOWEVER, BOXES ON FREE-STANDING STUB-UPS SHALL BE PROVIDED WITH EXTRA SUPPORT.

3. SUPPLEMENTARY SUPPORTS, CLIPS, AND BRACKETS SHALL BE CONSTRUCTED FROM STANDARD ROLLED STEEL SHAPES, HOT DIPPED GALVANIZED AFTER FABRICATION. ANGLES, PLATES, CHANNELS, UNI-STRUT, POWER STRUT OR RODS MAY BE USED FOR THIS PURPOSE. WELDING TO A GALVANIZED STRUCTURE SHALL NOT BE PERMITTED. USE CORROSION-PROOF BOLTS, STRAPS, ETC.

4. RACKS SHALL BE STRUCTURAL SHAPES WELDED OR BOLTED TOGETHER AND SUPPORTED FROM OTHER STRUCTURES, OR INDEPENDENTLY SUPPORTED BY CONCRETE FOUNDATIONS.

G. UNDERGROUND CONDUITS

1. MINIMUM BURIAL DEPTH FOR UNDERGROUND CONDUIT SHALL BE 24 INCHES BELOW TOP OF FINISHED GRADE. WHERE POWER CONDUIT IS INSTALLED IN THE SAME TRENCH AS GAS PIPE, INSTALL GAS PIPE AT LEAST 6" ABOVE THE CLOSEST POWER CONDUIT. ALL UNDERGROUND CONDUIT RUNS MUST BE CLEAR OF CROSSING PIPES OR STRUCTURES BY AT LEAST 6 INCHES; THUS, MINIMUM DEPTHS MAY BE REQUIRED THAT ARE GREATER THAN 24 INCHES TO BE PROPERLY SEPARATED FROM UNDERGROUND STRUCTURES .

2. CONDUITS PLACED UNDERGROUND SHALL BE RUN AS SHOWN ON DRAWINGS AND SUPPORTED A MINIMUM OF EVERY 10 FEET, USING FABRICATED DUCT SPACERS, TO PREVENT SAGGING WHILE WAITING FOR ENCASEMENT OR BACKFILL. CONDUITS RUN IN MULTIPLE SHALL BE SEPARATED AT LEAST 2 INCHES CLEAR. THEY SHALL BE SEPARATED EVENLY THROUGHOUT THE RUN, EXCEPT WHERE IT IS NECESSARY TO FAN OUT AT RISERS AND TRANSITIONS. CHANGE OF HORIZONTAL DIRECTIONS OF CONDUIT RUNS SHALL BE MADE IN LONG, GENTLE SWEEPS. INSTALL SPARE CONDUITS AS SHOWN ON DRAWINGS. BACKFILL AND TRENCHING SHALL BE CONSISTENT WITH THE PROVISIONS OF THIS SPECIFICATION.

3. add space MINIMUM HORIZONTAL CLEARANCE BETWEEN INCOMING UNDERGROUND UTILITIES (GAS OR ELECTRIC) AND OTHER PIPING OR CONDUITS.

4. WHERE MULTIPLE CONDUITS COME TO THE SURFACE, THROUGH SLABS OR PADS, CONDUIT SHALL CONTINUE TO 6 INCHES ABOVE THE SURFACE BEFORE INSTALLATION OF FITTINGS OR SEALS, WHEREVER PRACTICAL.

5. WHERE A SINGLE CONDUIT COMES TO THE SURFACE THROUGH SLABS OR PADS, CONCRETE ENCASEMENT SHALL TERMINATE AT THE SLAB OR PAD SURFACE. IF RISING INTO SLAB-MOUNTED OR PAD MOUNTED SWITCHBOARDS, MOTOR CONTROL CENTERS, AND SIMILAR EQUIPMENT, EXTEND THE CONDUIT UP 3 INCHES AND BUSH WITH AN INSULATED GROUNDING BUSHING.

6. ALL PVC CONDUIT RUNS COMING UP TO A CONCRETE SLAB, PAD, OR ABOVE GRADE CONDUIT RUN SHALL BE TERMINATED WITH A RIGID STEEL CONDUIT RISER AND THE APPROPRIATE ADAPTER FOR THIS TRANSITION OR AS NOTED ON PLANS.

H. ABOVEGROUND CONDUITS

1. ARRANGEMENT AND GROUPING OF DUCTS SHALL BE RUN AS-SHOWN ON THE DRAWINGS, FROM PLACE-TO-PLACE, AND SHALL BE INSTALLED AT ELEVATIONS IN ABOVE GRADE CONDUIT.

2. SUPPORT EXPOSED CONDUIT ON MAXIMUM SIX (6) FOOT CENTERS AND WITHIN TWO (2) FEET OF ANY CONNECTION POINT. CONDUIT AND FITTINGS MAY BE SUPPORTED FROM MACHINERY SUPPORTING STRUCTURES ADEQUATE FOR ADDITIONAL WEIGHT. CONDUIT AND FITTINGS CAN NOT BE CLAMPED OR WELDED OR BOLTED TO VESSELS FOR MACHINERY EXCEPT AS SPECIFICALLY PERMITTED BY CLEAN ENERGY OR AS SHOWN ON THE DRAWINGS.

3. FACTORY 90 DEGREE CONDUIT BENDS SHALL BE USED FOR CONDUIT SIZED 1-1/2 INCHES AND ABOVE. RADIUS OF FIELD BENDS SHALL NOT BE LESS THAN 10 TIMES DIAMETER OF CONDUIT. CONDUIT BENDS AND OFFSETS SHALL BE AVOIDED WHERE POSSIBLE. CONDUIT FLATTENED OR WRINKLED DURING BENDING SHALL NOT BE USED.

4. ENDS OF ALL CONDUITS TERMINATING IN OTHER THAN WIRING DEVICE BOXES SHALL BE PROVIDED WITH INSULATING BUSHINGS. INSULATED GROUNDING BUSHINGS WITH THROUGH-TERMINALS FOR NO.6 AWG WIRE SHALL BE PROVIDED ON ALL CONDUITS RISING INTO MOTOR CONTROL CENTERS AND SWITCHBOARDS.

5. INSTALL LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT BETWEEN RIGID CONDUIT AND MOTORS, VIBRATING EQUIPMENT, MOVABLE EQUIPMENT, AND INSTRUMENTS. MINIMUM ONE (1) FOOT AND MAXIMUM THREE (3) FEET IN LENGTH.

6. INSTALL CONDUIT SEALS WHERE REQUIRED. POUR SEALS WITH THE SEAL MANUFACTURER'S SPECIFIED COMPOUND AFTER SYSTEMS ARE FUNCTIONAL AND HAVE BEEN ACCEPTED BY CLEAN ENERGY AND THE JURISDICTION. SEAL FITTING PLUGS SHALL NOT BE INSTALLED FOR 24 HOURS AFTER POURING SEALING COMPOUND.

7. OPEN ENDS OF CONDUITS SHALL BE CAREFULLY PLUGGED DURING CONSTRUCTION TO PREVENT THE ENTRANCE OF FOREIGN MATERIALS. AFTER CONDUITS ARE INSTALLED, PULL A MANDREL THROUGH EACH CONDUIT TO CLEAR THE CONDUIT OF DEBRIS. FOLLOW THE MANDREL WITH WIRE BRUSHES AND SWABS TO COMPLETELY CLEAN THE CONDUIT. IMMEDIATELY AFTER A CONDUIT IS CLEANED, PLUG OR CAP THE RUN. INSTALL PULL STRINGS IN ALL SPARE CONDUITS, 3/16" NYLON MIN.

8. COVERED OPENINGS ON CONDUIT FITTINGS SHALL NOT BE BLOCKED BY STRUCTURAL STEEL OR PIPE WHICH WOULD NECESSITATE DISASSEMBLY OF PIPE, OR OTHER EXTREME MEASURES, FOR ACCESS TO THE INTERIOR OF FITTINGS FOR FUTURE WIRE REPLACEMENT AND PULLING.

9. ON MASONRY AND CONCRETE STRUCTURES, CONDUITS SHALL BE ATTACHED WITH ONE-HOLE PIPE STRAPS AND CLAMP-BACKS USING SCREW ANCHORS OR EXPANSION BOLTS.

10. EXPOSED CONDUIT SHALL BE INSTALLED PARALLEL TO STRUCTURAL MEMBERS AND SURFACES.

11. TWO OR MORE CONDUITS IN THE SAME GENERAL ROUTING SHALL BE PARALLEL WITH SYMMETRICAL BENDS.

12. CONDUITS SHALL BE INSTALLED AT LEAST 6 INCHES FROM HIGH TEMPERATURE PIPING, DUCTS, AND FLUES.

13. CONDUIT CONNECTIONS TO SHEET METAL ENCLOSURES SHALL BE SECURELY FASTENED BY LOCKNUTS INSIDE AND OUTSIDE.

14. CONDUITS SHALL BE INSTALLED BETWEEN THE REINFORCING STEEL IN WALLS OR SLABS WHICH HAVE REINFORCEMENT IN BOTH FACES. IN SLABS WHICH HAVE ONLY A SINGLE LAYER OF REINFORCING STEEL, CONDUITS SHALL BE CLEAR OF THE STEEL AND THE CONCRETE SURFACE.

15. UPON COMPLETION, ENSURE THAT EQUIPMENT IS CLEAN; STRUCTURAL ELEMENTS ARE COMPLETE AND TIGHT; ARE PROPERLY HARNESSED, SECURED, AND IDENTIFIED; CONDUITS ARE BUSHED, TAGGED, AND SUPPORTED; SEALS ARE IN PLACE; GROUND WIRES ARE PROVIDED AND CONNECTED; TAGS, LABEL PLATES, AND INSTRUCTION PLATES ARE ATTACHED AND SECURE.

EXP. DATE: 10/31/2017
COLORADO LICENSED
RICHARD L. REMILLARD
0047005
PROFESSIONAL ENGINEER
DATE SIGNED:

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

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Clean Energy®

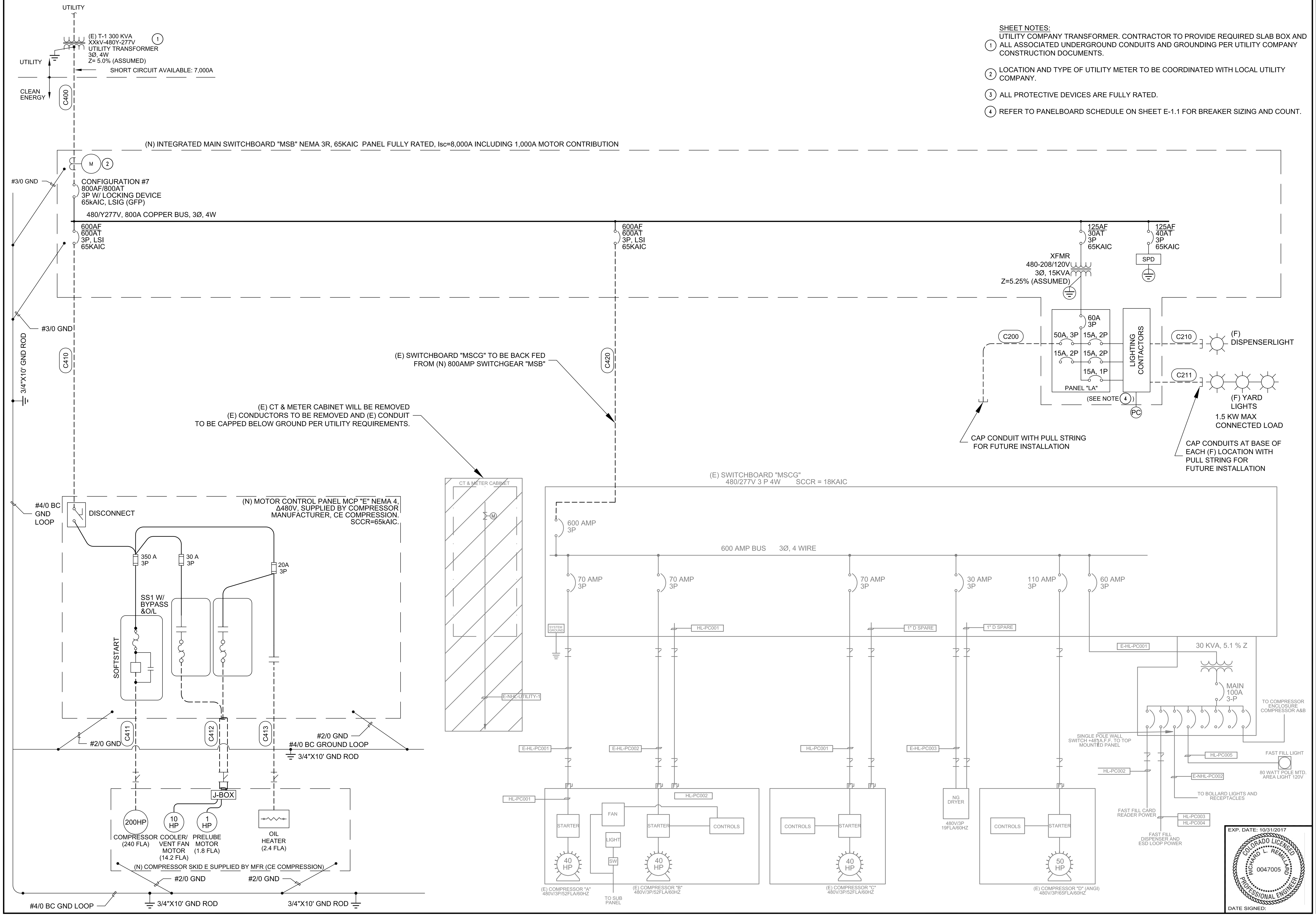
4675 MAC ARTHUR COURT, STE. 800 | NEWPORT BEACH, CA 92660
TEL:(949) 437-1000 | FAX: (949) 724-1397 | WWW.CLEANENERGYFUELS.COM

CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
ELECTRICAL NOTES

ASSET NO: 160-11-17307.02.00

DATE 05/01/2017
DESIGNED BY HVT
CHECKED BY MES
APPROVED BY RLR
SCALE
SHEET E-0.0

W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.00)\2.0 Drawings and Engineering\013-E00-ELECTRICAL NOTES.dwg - PLOTTED: May 12, 2017 - 1:29pm



UTILITY
(E) T-1 300 KVA
XXkV-480Y-277V
UTILITY TRANSFORMER
3Ø, 4W
Z= 5.0% (ASSUMED)
SHORT CIRCUIT AVAILABLE: 7,000A
CLEAN ENERGY
C400
(N) INTEGRATED MAIN SWITCHBOARD "MSB" NEMA 3R, 65KAIC PANEL FULLY RATED, Isc=8,000A INCLUDING 1,000A MOTOR CONTRIBUTION
#3/0 GND
CONFIGURATION #7
800AF/800AT
3P W/ LOCKING DEVICE
65kAIC, LSIG (GFP)
480/Y277V, 800A COPPER BUS, 3Ø, 4W
600AF
600AT
3P, LSI
65KAIC
125AF
30AT
3P
65KAIC
125AF
40AT
3P
65KAIC
XFMR
480-208/120V
3Ø, 15KVA
Z=5.25% (ASSUMED)
SPD
60A
3P
50A, 3P
15A, 2P
15A, 2P
15A, 2P
15A, 1P
PANEL "LA"
(SEE NOTE 4)
LIGHTING CONTACTORS
PC
C200
C210
C211
(F) DISPENSERLIGHT
(F) YARD LIGHTS
1.5 KW MAX CONNECTED LOAD
CAP CONDUIT WITH PULL STRING FOR FUTURE INSTALLATION
CAP CONDUITS AT BASE OF EACH (F) LOCATION WITH PULL STRING FOR FUTURE INSTALLATION
#3/0 GND
3/4"X10' GND ROD
C410
C420
(E) SWITCHBOARD "MSCG" TO BE BACK FED FROM (N) 800AMP SWITCHGEAR "MSB"
(E) CT & METER CABINET WILL BE REMOVED
(E) CONDUCTORS TO BE REMOVED AND (E) CONDUIT TO BE CAPPED BELOW GROUND PER UTILITY REQUIREMENTS.
CT & METER CABINET
E-NHL-UTILITY-1
(E) SWITCHBOARD "MSCG"
480/277V 3 P 4W SCCR = 18KAIC
600 AMP 3P
600 AMP BUS 3Ø, 4 WIRE
70 AMP 3P
70 AMP 3P
70 AMP 3P
30 AMP 3P
110 AMP 3P
60 AMP 3P
SYSTEM GROUND
HL-PC001
1" D SPARE
1" D SPARE
E-HL-PC001
30 KVA, 5.1 % Z
MAIN 100A 3-P
TO COMPRESSOR ENCLOSURE COMPRESSOR A&B
SINGLE POLE WALL SWITCH +48"A.F.F. TO TOP MOUNTED PANEL
HL-PC005
FAST FILL LIGHT
80 WATT POLE MTD. AREA LIGHT 120V
HL-PC002
E-NHL-PC002
TO BOLLARD LIGHTS AND RECEPTACLES
FAST FILL CARD READER POWER
HL-PC003
HL-PC004
FAST FILL DISPENSER AND ESD LOOP POWER
E-HL-PC001
E-HL-PC002
HL-PC001
E-HL-PC003
HL-PC001
HL-PC002
STARTER
FAN
LIGHT
SW
STARTER
CONTROLS
CONTROLS
STARTER
NG DRYER
480V/3P 19FLA/60HZ
CONTROLS
STARTER
40 HP
40 HP
40 HP
50 HP
(E) COMPRESSOR "A" 480V/3P/52FLA/60HZ
TO SUB PANEL
(E) COMPRESSOR "B" 480V/3P/52FLA/60HZ
(E) COMPRESSOR "C" 480V/3P/52FLA/60HZ
(E) COMPRESSOR "D" (ANGI) 480V/3P/65FLA/60HZ
#4/0 BC GND LOOP
DISCONNECT
(N) MOTOR CONTROL PANEL MCP "E" NEMA 4, Δ480V, SUPPLIED BY COMPRESSOR MANUFACTURER, CE COMPRESSION. SCCR=65kAIC.
350 A 3P
30 A 3P
20A 3P
SS1 W/ BYPASS &O/L
SOFTSTART
C411
C412
C413
#2/0 GND
#2/0 GND
#4/0 BC GROUND LOOP
3/4"X10' GND ROD
J-BOX
200HP
10 HP
1 HP
COMPRESSOR (240 FLA)
COOLER/ VENT FAN MOTOR (14.2 FLA)
PRELUBE MOTOR (1.8 FLA)
OIL HEATER (2.4 FLA)
(N) COMPRESSOR SKID E SUPPLIED BY MFR (CE COMPRESSION)
#2/0 GND
#2/0 GND
#4/0 BC GND LOOP
3/4"X10' GND ROD
3/4"X10' GND ROD

SHEET NOTES:

1. UTILITY COMPANY TRANSFORMER. CONTRACTOR TO PROVIDE REQUIRED SLAB BOX AND ALL ASSOCIATED UNDERGROUND CONDUITS AND GROUNDING PER UTILITY COMPANY CONSTRUCTION DOCUMENTS.
2. LOCATION AND TYPE OF UTILITY METER TO BE COORDINATED WITH LOCAL UTILITY COMPANY.
3. ALL PROTECTIVE DEVICES ARE FULLY RATED.
4. REFER TO PANELBOARD SCHEDULE ON SHEET E-1.1 FOR BREAKER SIZING AND COUNT.

EXP. DATE: 10/31/2017
COLORADO LICENSED PROFESSIONAL ENGINEER RICHARD L. REMILLARD 0047005
DATE SIGNED:

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

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Clean Energy®

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CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
ELECTRICAL SINGLE LINE DIAGRAM

ASSET NO: 160-11-17307.02.00

DATE	DESIGNED BY	ARY
05/01/2017	CHECKED BY	MES
	APPROVED BY	RLR

SCALE: AS NOTED

SHEET: E-1.0

SCHEDULE OF LOADS IN SWITCHBOARD "MSB" 480Y/277V, 3-ϕ, 4-WIRE (SERVICE LOAD CALCULATION)		
DESCRIPTION	LOAD [KVA]	FLA
FEEDER "C410" TO MCP "E"	206.50	259.0
PANELBOARD "LA"	15.0	18.0
(E) SWITCHBOARD "MSCG"	233.5	280.8
SUBTOTAL LOAD	455.0	557.8
25% OF LARGEST MOTOR LOAD	47.8	60.0
TOTAL LOAD - SWITCHBOARD "MSB"	502.8	617.8

SCHEDULE OF LOADS IN MCP "E" Δ480V, 3-ϕ, 3-WIRE			
DESCRIPTION	LOAD [HP]	LOAD [KVA]	FLA
FEEDER "C410" LOADS			
COMPRESSOR E	200	191.2	240
COOLER FAN MOTOR E1	10	11.3	14.2
PRELUBE MOTOR	1.0	1.4	1.80
OIL HEATER (CONTINUOUS)		2.0	2.4
25% OF HEATER LOAD		0.5	0.6
SUBTOTAL LOAD	211.0	206.5	259.0
25% OF LARGEST MOTOR LOAD	50.0	47.8	60.0
TOTAL LOAD - FEEDER "C410"	261.0	254.3	319.0

CONDUIT AND WIRE SCHEDULE (SEE NOTE 2)								
I. D. NO.	CONDUIT(S)	JW CONDUIT	FILL [%]	CONDUCTORS/CONDUIT	AMPACITY	REQ'D AMPACITY	LENGTH [ft]	VOLTAGE DROP [%]
C210	3/4"		10.7%	(2) #12 + #12 GND	25.0	1.1	100	0.2%
C211	3/4"		10.7%	(2) #12 + #12 GND	25.0	5.3	250	2.1%
C400	(3) 4"		14.5%	(4) 300 KCMIL	855.0	617.8	200(EST)	0.9%
C410	(2) 3"		23.5%	(3) 350 KCMIL + #1 GND	620.0	319.0	30	0.1%
C411	3"	E1	23.5%	(3) 350KCMIL + #1 GND	310.0	300.0	40	0.3%
C412	1"	E2	20.4%	(3) #10 + (1)#10 GND	28.0	17.8	40	0.3%
				(3) #12 + (1)#12 GND	20.0	2.3		
C413	3/4"	E3	14.3%	(3) #12 + (1)#12 GND	25.0	3	40	0.1%
C420	(2) 3"		23.5%	(3) 350 KCMIL + #1 GND	620.0	297.1	150	0.4%

SCHEDULE OF LOADS IN (E) SWITCHBOARD "MSCG" 480Y/277V, 3-ϕ, 4-WIRE (SERVICE LOAD CALCULATION)			
DESCRIPTION	LOAD [HP]	LOAD [KVA]	FLA
COMPRESSOR A	40.0	43.2	52
COMPRESSOR B	40.0	43.2	52
COMPRESSOR C	40.0	43.2	52
COMPRESSOR D "ANGI"	50	54.0	65.0
30KVA XFMR		30	36.1
CNG DRYER		15.8	19
GAS DRYER (CONTINUOUS)		3.9	4.8
SUBTOTAL LOAD		233.5	280.8
25% OF LARGEST MOTOR LOAD	12.5	13.5	16.3
TOTAL LOAD - SWITCHBOARD "MSB"		247.0	297.1

SINGLE LINE DIAGRAM SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
M	UTILITY KWHR METER		POWER TRANSFORMER
	GROUND CONNECTION	GFP	GROUND FAULT PROTECTION
	MAGNETIC STARTER WITH NEMA SIZE INDICATED		EXPOSED CONDUIT
	SPACE HEATER		SEALTIGHT FLEXIBLE CONDUIT
	SOLENOID		"T" TYPE FITTING
	UNIT WIRING		"L" TYPE FITTING
	FIELD WIRING		CONDUIT WITH CONDUIT SEAL FITTING
G	STATUS INDICATING LAMP (W/ COLOR INDICATED)		GROUND WIRE
MOMENTARY	MOMENTARY PUSHBUTTON		3/4" DIA x 10'-0" LONG COPPER CLAD GROUND ROD
MAINTAINED	MAINTAINED PUSHBUTTON W/ MUSHROOM HEAD		SINGLE NON LOCKING RECEPTACLE 20A, 120V, 2P, 3W. GNDG.
F	FUSE (F=FUSE SIZE)	GFI	GROUNDING TYPE DUPLEX OUTLET WITH GROUND FAULT INTERRUPTING
NO / NC	GENERAL CONTACT STARTER, RELAY, ETC	C	CONTACTOR
	CIRCUIT BREAKER	HP	THREE PHASE MOTOR
	THERMAL OVERLOAD ELEMENT		SINGLE PHASE MOTOR
AF / AT, P	MOLDED CASE CIRCUIT BREAKER WITH BREAKER FRAME & TRIP AMP RATING, NO. OF POLES		LIGHTING OR POWER PANEL
AS / P, AF	FUSED SWITCH WITH SWITCH AMP RATING, NO. OF POLES, FUSE AMP RATING		ESD - EMERGENCY SHUT DOWN DEVICE CLASS 1 DIV 2 GROUP D FUSED DISCONNECT SWITCH, SIZE NOTED ON PLANS. NON FUSED DISCONNECT SWITCH, SIZE NOTED ON PLANS.
K	KIRK KEY		HOME RUN TO PANEL
		J	JUNCTION BOX
		CXXX	CABLE/CONDUIT RUN IDENTIFICATION #
		PC	PHOTOCELL
		SPD	SURGE PROTECTION DEVICE
		UPS	UNINTERRUPTIBLE POWER SUPPLY
		ATS	AUTOMATIC TRANSFER SWITCH
		MTS	MANUAL TRANSFER SWITCH

PANELBOARD 'LA'

MAIN: 208/120 VOLT / 3 PHASE / 4 WIRE — MAIN BREAKER: 60A — MOUNTING: SURFACE
BUS: 1 SECTION: SINGLE LUGS — BUS: 250A — A.I.C. RATING: 10K

LOAD VA	LOAD DESCRIPTION	OUTLETS M	OUTLETS R	OUTLETS L	CB / P	CKT #	PHASE	CKT #	CB / P	OUTLETS L	OUTLETS R	OUTLETS M	LOAD DESCRIPTION	LOAD VA
	MAIN BREAKER				60/3	1	A	2	15/2				SPARE	150
	MAIN BREAKER					3	B	4					SPARE	150
	MAIN BREAKER					5	C	6	15/2				DISPENSER LIGHTING	88
2000	(F) FUEL SYSTEM SUPPORT PANEL				50/3	7	A	8					DISPENSER LIGHTING	88
2000	(F) FUEL SYSTEM SUPPORT PANEL					9	B	10	15/2				YARD LIGHTING	438
2000	(F) FUEL SYSTEM SUPPORT PANEL					11	C	12					YARD LIGHTING	438
2400	SKID CONTROL POWER				30/1	13	A	14	20/1				CARD READER POWER	500
100	DEWPOINT SENSOR POWER				15/1	15	B	16	15/1				LIGHTING CONTACTOR	300
	SPARE				20/1	17	C	18	20/1				RECEPTACLE	1920

PHASE	A	B	C
PHASE TOTAL VA:	5138	2988	4446

PANEL TOTAL: CONNECTED	12572	VA
(L.C.L.) @125%:	0	VA
(K.E.L.) @ 65%:	0	VA
(LARGEST MOTOR) 125%:	0	VA
GEN. RECEPT. DEMAND	0	VA
REMAINING @100%	12572	VA
PANEL TOTAL W/ DEMAND:	12572	VA

PANEL LOCATION: CNG EQUIPMENT YARD
AREA SERVED: CNG EQUIPMENT YARD
FED FROM: MAIN SWITCHBOARD

15.1 FULL LOAD AMPS @ 480V 3ϕ

(FUTURE BY OTHERS)

LIGHTING FIXTURE SCHEDULE						
TYPE	DESCRIPTION	LAMPS	VOLTAGE	WATTAGE	QTY.	TOTAL WATTAGE
A	METAL HALIDE LIGHT WITH (2) ARMS MOUNTED @ 180°. CEW LIGHTING MFG. MODEL: FPS8417-M LIGHTS MOUNTED ON A 4"X4"X20'H POLE 8.25" X 8.25" BASE MOUNT.	175W,	208V	2 X 175 W	2	700W
B	METAL HALIDE LIGHT WITH (1) ARMS MOUNTED. CEW LIGHTING MFG. MODEL: FPS8417-M LIGHTS MOUNTED ON A 4"X4"X20'H POLE 8.25" X 8.25" BASE MOUNT.	175W,	208V	175 W	2	350W

SHEET NOTES:

1. CONDUCTOR SIZES ARE SUITABLE FOR AMBIENT TEMPERATURES UP TO 40°C (104°F).
2. ALL CONDUITS SHALL BE SCH 40 PVC UNDERGROUND, AND RMC ABOVE GROUND. CONDUIT FILLS SHOWN ARE FOR SCH 40 PVC.

DESIGN INTENT:

SIZE POWER FEEDERS AND SELECT OVER-CURRENT PROTECTION BASED ON EQUIPMENT LAYOUT, ENGINEERING DATA, MOTOR CONTROL PANEL DESIGN AND EQUIPMENT LOADS PROVIDED BY CLEAN ENERGY AND THE EQUIPMENT MANUFACTURER.

EXP. DATE: 10/31/2017
COLORADO LICENSED PROFESSIONAL ENGINEER RICHARD L. REMILLARD 0047005
DATE SIGNED:

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

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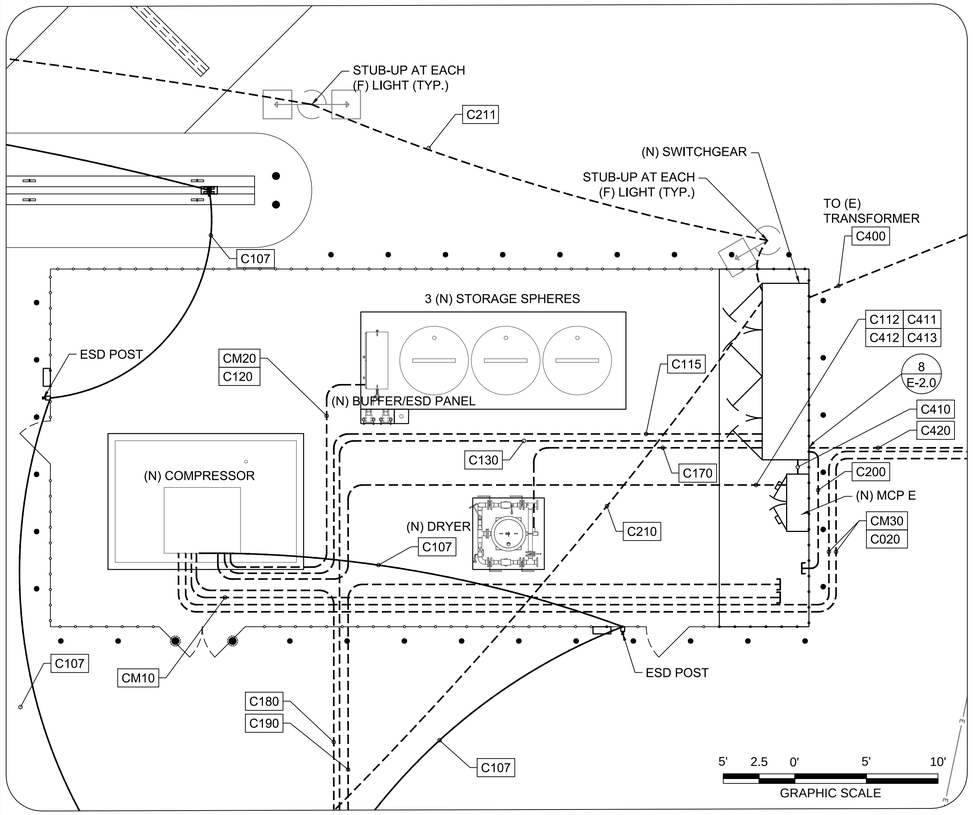
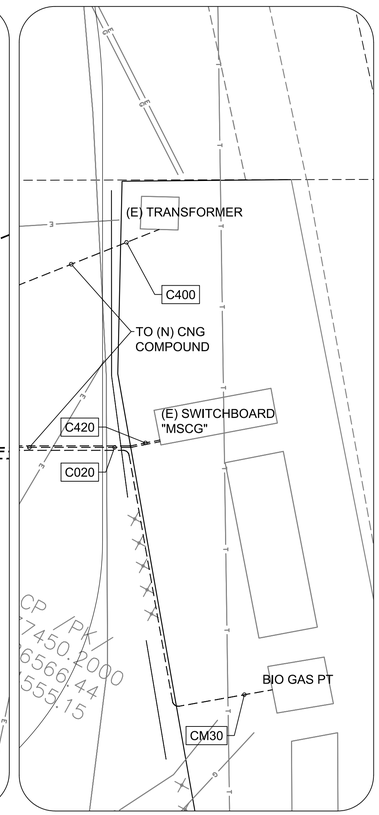
CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
ELECTRICAL LOAD SCHEDULE

ASSET NO: 160-11-17307.02.00

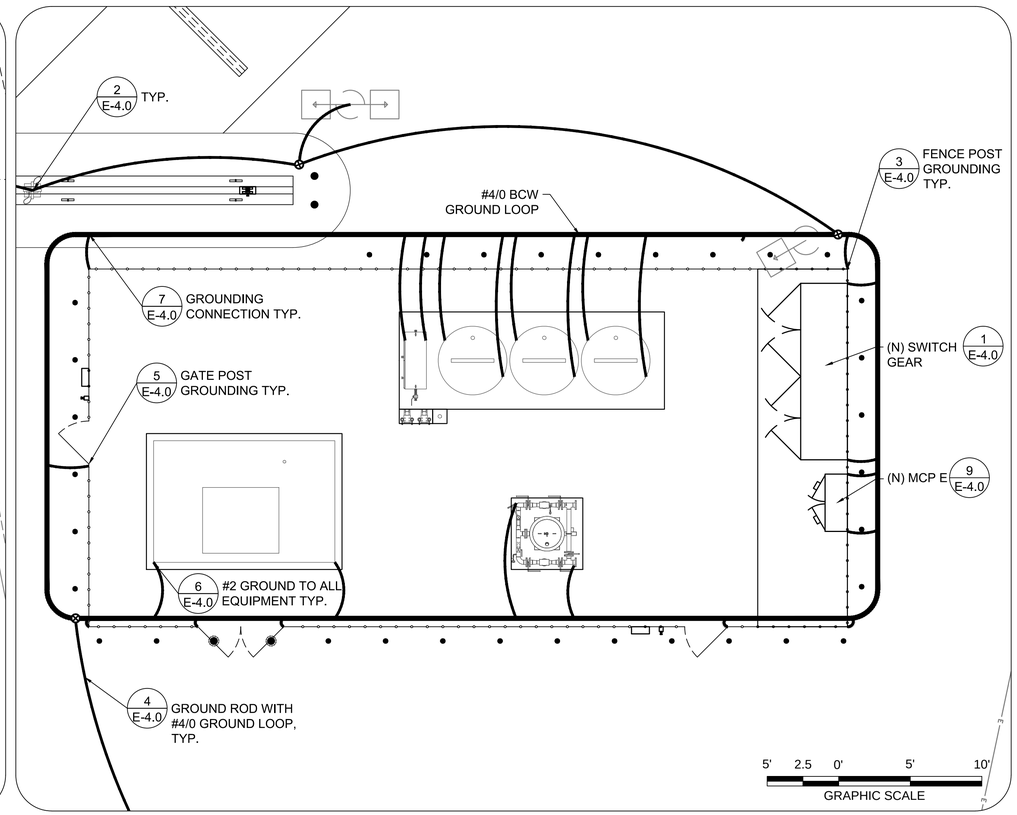
DATE 05/01/2017 — DESIGNED BY ARY — CHECKED BY MES — APPROVED BY RLR
SCALE: AS NOTED
SHEET: E-1.1



EQUIPMENT COMPOUND ELECTRICAL LAYOUT (1"=5')



CONNECTION TO (E) EQUIPMENT (1"=12')



EQUIPMENT COMPOUND GROUNDING LAYOUT (1"=5')

ELECTRICAL NOTES

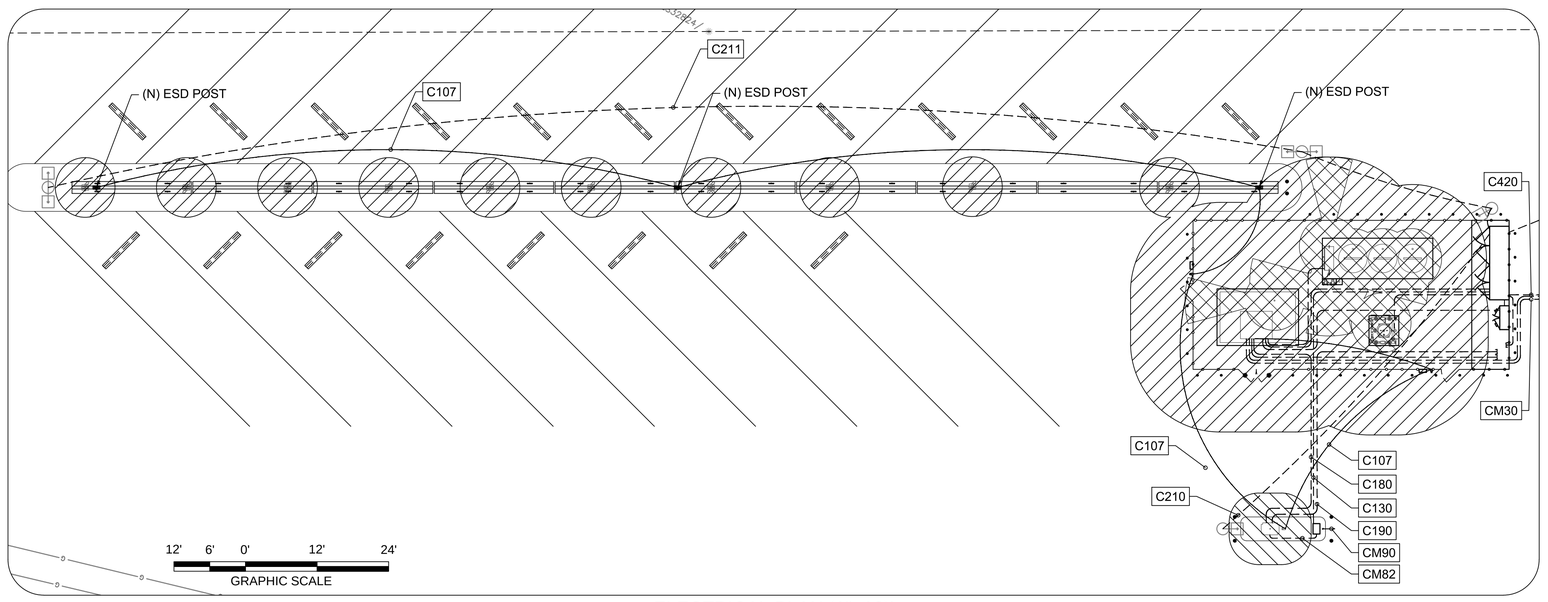
1. PROVIDE #2 PIGTAIL FOR ALL EQUIPMENT GROUNDING. CONNECT ALL #2 PIGTAILS TO MAIN GROUND BUS.
2. ALL BURIED GROUND CONNECTIONS SHALL BE CAD-WELDED.
3. CADWELD #2 PIGTAIL TO COMPRESSOR SLAB REBAR: 2 LOCATIONS MINIMUM.
4. HOME RUN ROUTING TO BE DETERMINED IN THE FIELD.
5. SEE TYPICAL GROUND WELL DETAIL ON SHEET E-4.0.
6. POLE RISER AND UTILITY TRANSFORMER GROUNDING SHALL BE DONE BY THE UTILITY COMPANY.
7. ALL ELECTRICAL WIRING SHALL CONFORM TO NEC SECTION 501.10(A) FOR CLASS 1 DIVISION 1 AREAS AND SECTION 501.10(B) FOR CLASS 1 DIVISION 2 AREAS.
8. CONTRACTOR SHALL PROVIDE CONDUIT SEALS WHERE REQUIRED BY CHAPTER 500 OF THE NEC FOR CLASSIFIED AREAS.
9. REFER TO NFPA 52 TABLE 8.4.2.0 AND NEC ARTICLE 514 FOR EXTENT OF CLASSIFIED AREA(S) FOR PROPOSED CNG AS WELL AS EXISTING LIQUID AND PROPANE FUELS (IF ANY).
10. CLASSIFIED AREA(S) IN PLAN VIEW ARE SHOWN HATCHED. AREA EXTENDING OVER TOP OF UNPIERCED WALL(S) SHOWN AS DASHED LINE.
11. COMPRESSOR SKID WITH EMERGENCY SHUTDOWN (ESD) PUSH BUTTON IS FACTORY INSTALLED.
12. COORDINATE PHONE SERVICE REQUIREMENTS WITH OWNER.
13. COORDINATE EQUIPMENT INSTALLATION AND CONDUIT ROUTING WITH OTHER WORK.
14. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING UTILITIES AND UNDERGROUND PIPING AND CONDUITS PRIOR TO START OF EXCAVATION.
15. COORDINATE ROUTING AND INSTALLATION OF ELECTRIC SERVICE WITH LOCAL UTILITY.
16. EQUIPMENT DIMENSIONS AND TIE-IN POINTS ARE APPROXIMATE. COORDINATE INSTALLATION IN THE FIELD BASED UPON ACTUAL EQUIPMENT AND EQUIPMENT INSTALLATION MANUALS PROVIDED.
17. EMERGENCY SHUTDOWN (ESD) PUSH BUTTONS SHALL BE LOCATED WITHIN 10 FEET AND ALSO GREATER THAN 25-FEET FROM DISPENSING AREAS. (NFPA 52 8.11.5)
18. UNDERGROUND CONDUIT SHALL BE BURIED NOT LESS THAN 24-INCHES BELOW GRADE. MAINTAIN 3 FT MINIMUM HORIZONTAL CLEARANCE BETWEEN INCOMING UNDERGROUND UTILITIES (GAS OR ELECTRIC) AND OTHER PIPING OR CONDUITS RUNNING PARALLEL TO THEM AND 1FT MINIMUM VERTICAL CLEARANCE WHERE CROSSING.
19. REFER TO CONDUIT SCHEDULE AND SINGLE LINE FOR CONDUIT AND CONDUCTOR SIZING AND TYPES. ALL NEW CONDUCTORS SHALL BE TYPE THHN UNLESS OTHERWISE NOTED.
20. ALL CONDUIT RUNS SHOWN ARE SCHEMATIC.

ELECTRICAL LEGEND

C400 DENOTES CONDUITS LISTED ON SHEET E-2.0

CLASS 1, DIV I SPACE

CLASS 1, DIV 2 SPACE SEE NOTES 7, 8, 9, 10



ELECTRICAL PLAN (1"=12')

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

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CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
ELECTRICAL PLAN

EXP. DATE: 10/31/2017
COLORADO LICENSED
RICHARD L. REMILLARD
0047005
PROFESSIONAL ENGINEER
DATE SIGNED:

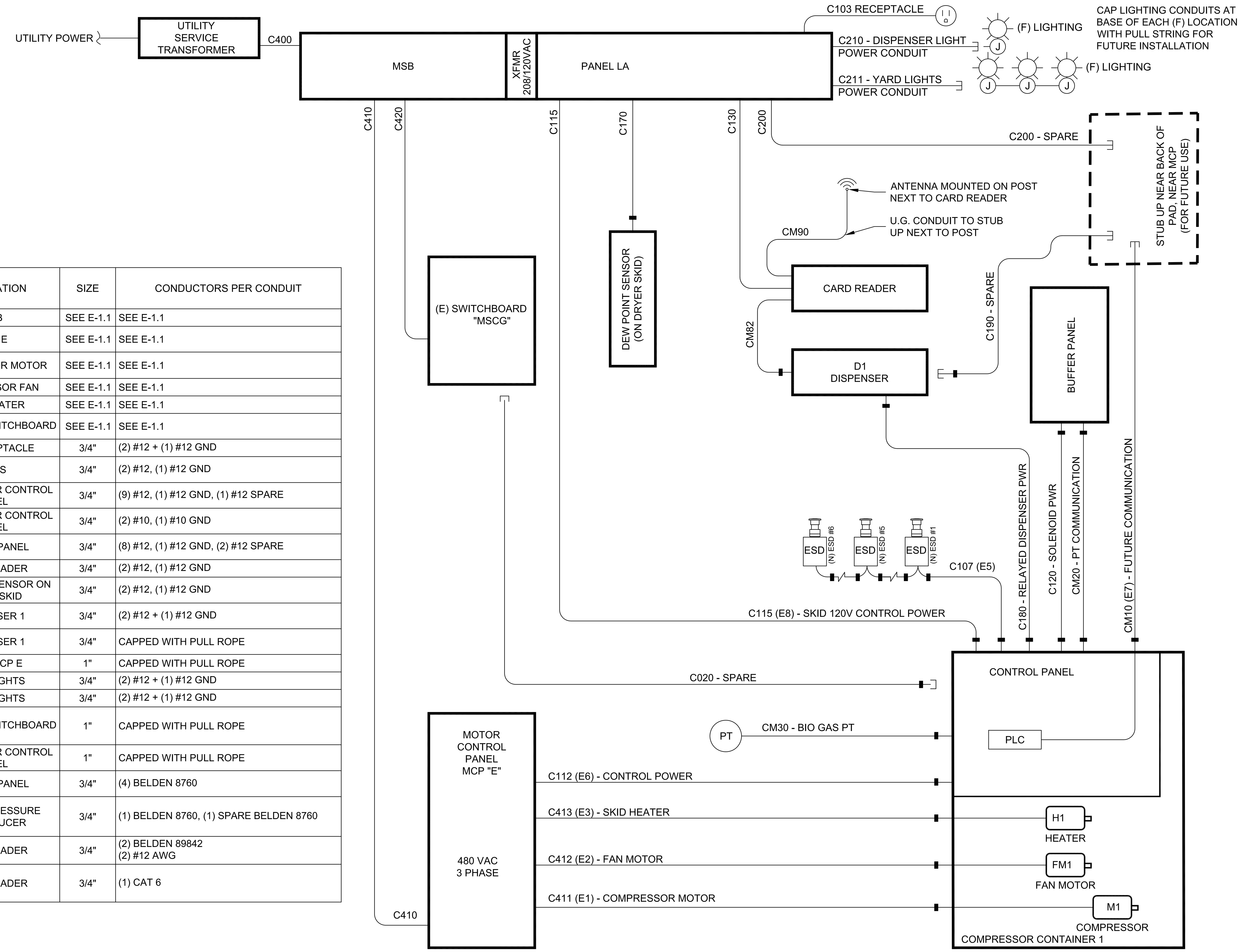
DATE 05/01/2017	DESIGNED BY HVT CHECKED BY MES APPROVED BY RLR
SCALE	AS NOTED
SHEET	E-2.0

ASSET NO: 160-11-17307.02.00

W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.00)\2.0 Drawings and Engineering\03 E02 ELECTRICAL PLAN.dwg - PLOTTED: May 12, 2017 - 1:30pm

NOTES:

1. SEE JW POWER CNG MANUFACTURER'S DRAWING SHEET FOR ALL REQUIRED FEEDERS AND COMMUNICATION LINES FROM MOTOR CONTROL PANEL TO COMPRESSOR CONTAINER EQUIPMENT. PROVIDE ALL REQUIRED CONNECTIONS. FIELD COORDINATE WITH EQUIPMENT DRAWING.
2. SEE JW POWER CONTROL PANEL DRAWING FOR WIRING TERMINATIONS.
3. INDICATES ─▮─ CONDUIT SEAL FITTING REQUIRED.



CKT NO.	JW CKT. NO.	DESCRIPTION	VOLTAGE [V]	#-ϕ	ORIGIN	DESTINATION	SIZE	CONDUCTORS PER CONDUIT
C400	-	UTILITY POWER	480	3	UTILITY XFMR	MSB	SEE E-1.1	SEE E-1.1
C410	-	POWER TO MCP E	480	3	MSB	MCP E	SEE E-1.1	SEE E-1.1
C411	E1	COMPRESSOR MOTOR CONDUIT	480	3	MCP E	COMPRESSOR MOTOR	SEE E-1.1	SEE E-1.1
C412	E2	POWER TO JUNCTION BOX #930	480	3	MCP E	COMPRESSOR FAN	SEE E-1.1	SEE E-1.1
C413	E3	DRYER POWER	480	3	MCP E	SKID HEATER	SEE E-1.1	SEE E-1.1
C420	-	POWER TO (E) "MSCG" SWITCHBOARD	480	3	MCP E	(E) "MSCG" SWITCHBOARD	SEE E-1.1	SEE E-1.1
C103	-	POWER TO WP RECEPTACLE	120	1	PANEL "LA"	WP RECEPTACLE	3/4"	(2) #12 + (1) #12 GND
C107	E5	ESD LOOP	24	1	COMPRESSOR CONTROL PANEL	ESD'S	3/4"	(2) #12, (1) #12 GND
C112	E6	CONTROL POWER	120	1	MCP E	COMPRESSOR CONTROL PANEL	3/4"	(9) #12, (1) #12 GND, (1) #12 SPARE
C115	E8	CONTROL POWER	120	1	PANEL "LA"	COMPRESSOR CONTROL PANEL	3/4"	(2) #10, (1) #10 GND
C120	-	BUFFER PANEL SOLENOID PWR	120	1	COMPRESSOR CONTROL PANEL	BUFFER PANEL	3/4"	(8) #12, (1) #12 GND, (2) #12 SPARE
C130	-	CARD READER POWER	120	1	PANEL "LA"	CARD READER	3/4"	(2) #12, (1) #12 GND
C170	-	DEW POINT SENSOR PWR	120	1	PANEL "LA"	DEW POINT SENSOR ON DRYER SKID	3/4"	(2) #12, (1) #12 GND
C180	-	RELAYED POWER TO DISPENSER	120	1	COMPRESSOR CONTROL PANEL	DISPENSER 1	3/4"	(2) #12 + (1) #12 GND
C190	-	SPARE CONDUIT	-	-	NEAR MCP E	DISPENSER 1	3/4"	CAPPED WITH PULL ROPE
C200	-	SPARE PWR CONDUIT	-	-	PANEL "LA"	NEAR MCP E	1"	CAPPED WITH PULL ROPE
C210	-	(F) POWER TO DISPENSER LIGHT	208	1	PANEL "LA"	YARD LIGHTS	3/4"	(2) #12 + (1) #12 GND
C211	-	(F) POWER TO YARD LIGHTS	208	1	PANEL "LA"	YARD LIGHTS	3/4"	(2) #12 + (1) #12 GND
C020	-	SPARE CONDUIT	-	-	COMPRESSOR SKID	(E) "MSCG" SWITCHBOARD	1"	CAPPED WITH PULL ROPE
CM10	E7	SPARE CONDUIT - FUTURE LAN COMMUNICATION	(DATA)	-	NEAR MCP E	COMPRESSOR CONTROL PANEL	1"	CAPPED WITH PULL ROPE
CM20	-	BUFFER PANEL PRESSURE TRANSDUCERS	(DATA)	-	COMPRESSOR CONTROL PANEL	BUFFER PANEL	3/4"	(4) BELDEN 8760
CM30	-	BIO GAS PRESSURE TRANSDUCER	(DATA)	-	COMPRESSOR CONTROL PANEL	BIO GAS PRESSURE TRANSDUCER	3/4"	(1) BELDEN 8760, (1) SPARE BELDEN 8760
CM82	-	CARD READER COMMUNICATION	RS-485 24VDC	1	DISPENSER 1	CARD READER	3/4"	(2) BELDEN 89842 (2) #12 AWG
CM90	-	CARD READER ANTENNA COMMUNICATION TO ELECTRICAL ROOM	(DATA)	1	DISPENSER 1	CARD READER	3/4"	(1) CAT 6

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

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EXP. DATE: 10/31/2017
COLORADO LICENSED PROFESSIONAL ENGINEER RICHARD L. REMILLARD 0047005
DATE SIGNED:

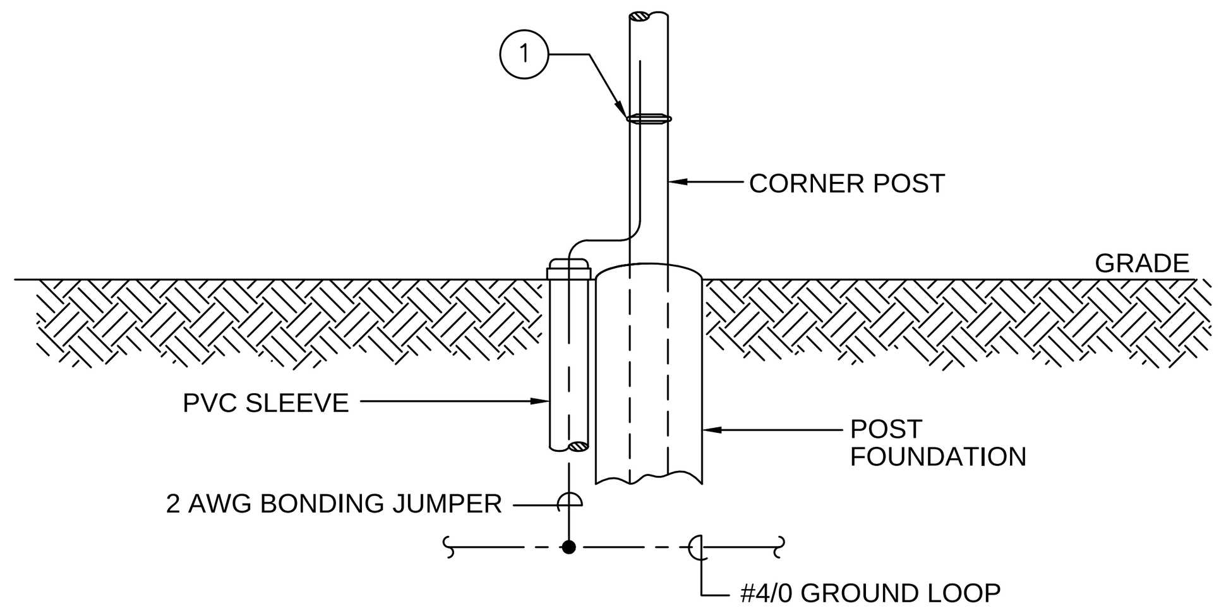
CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
ELECTRICAL CONDUIT SCHEDULE

ASSET NO: 160-11-17307.02.00

DATE 05/01/2017 | DESIGNED BY ARY | CHECKED BY MES | APPROVED BY RLR

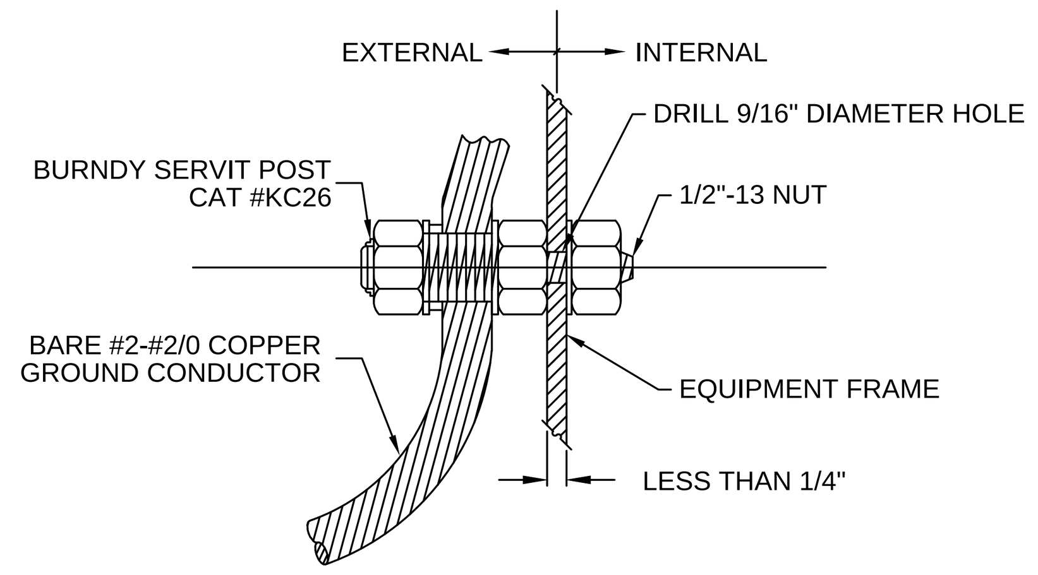
SCALE: AS NOTED

SHEET: E-3.0

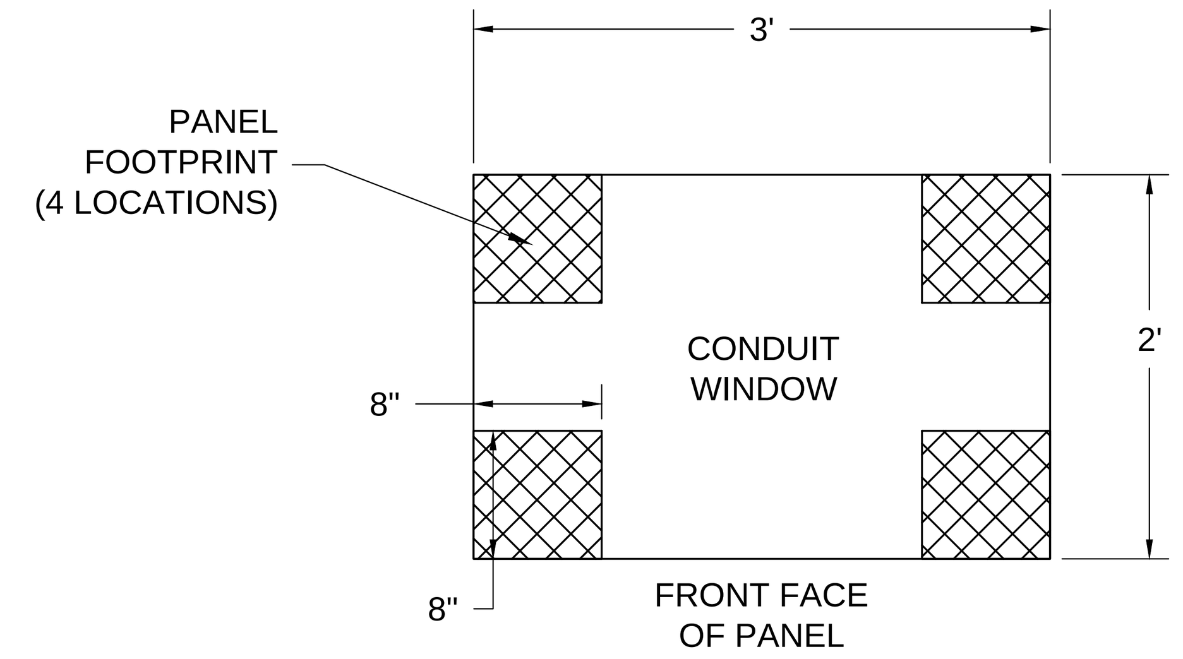


ITEM	QTY	DESCRIPTION
1	1	CONNECTOR, GROUND, BURNDY, TYPE GAR OR EQUAL

FENCE POST GROUNDING 3 E-2.0
N.T.S.



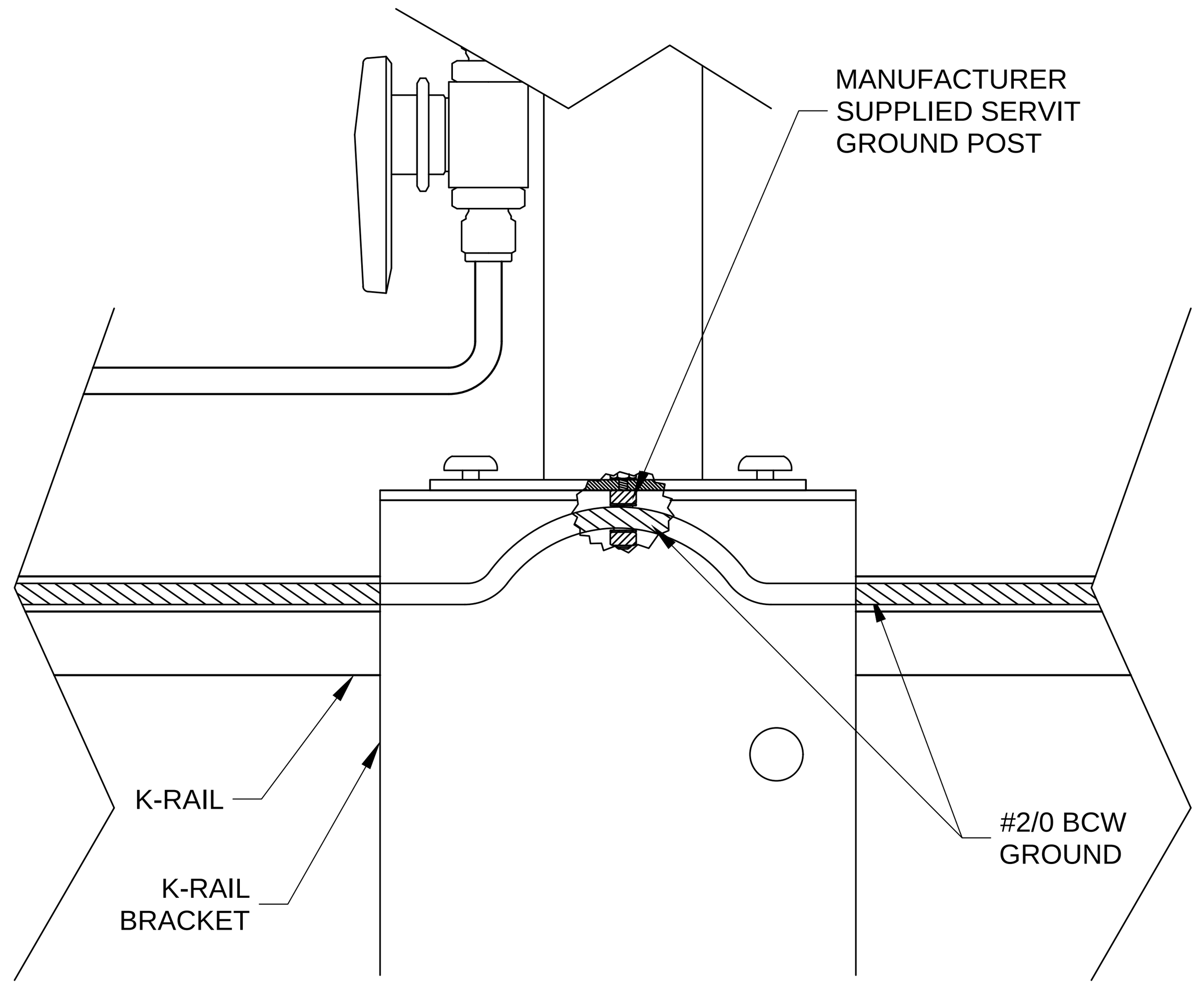
BOLTED EQUIPMENT GROUNDING 6 E-2.0
N.T.S.



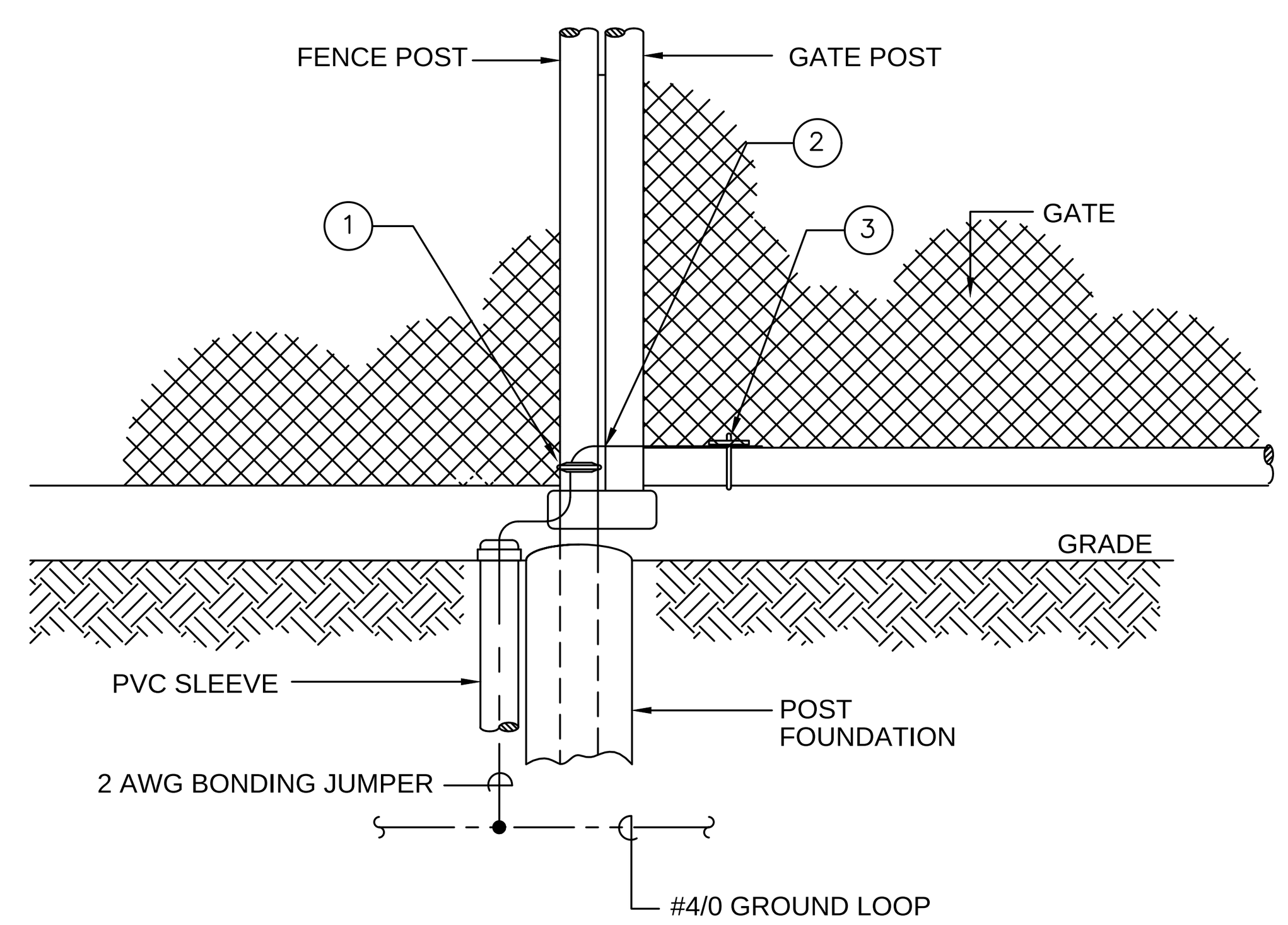
FUEL SYSTEM SUPPORT PANEL CONDUIT WINDOW 10 E-2.0
N.T.S.

GROUNDING NOTES

1. FOR ELECTRICAL ABBREVIATIONS, LEGEND, NOTES & SPECIFICATIONS, SEE DRAWING E-0.0.
2. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY ONLY AND IS NOT INTENDED TO SHOW EXACT EQUIPMENT LOCATION OR CONDUIT ROUTING. THE ELECTRICAL CONTRACTOR SHALL DETERMINE, IN THE FIELD, THE BEST ROUTING TO AVOID ANY INTERFERENCE WITH EXISTING UNDERGROUND UTILITIES, EXISTING ABOVEGROUND STRUCTURES OR OTHER EQUIPMENT.
3. THE ELECTRICAL CONTRACTOR SHALL FOLLOW EQUIPMENT MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION AND TERMINATION OF CONDUIT AND WIRING.
4. GROUND CONNECTIONS AT MAIN GROUND LOOP SHALL BE MADE USING BURNDY "HYGROUND" IRREVERSIBLE COMPRESSION FITTINGS, OR APPROVED EQUAL. THE NEW GROUND LOOP CABLE SHALL BE CONTINUOUS.
5. GROUNDING CABLE SHALL BE INSTALLED WITHOUT SHARP BENDS OR KINKS, AND WHERE BENDS OR LOOPS ARE REQUIRED, THEY SHALL BE MADE WITH AS LARGE A RADIUS AS POSSIBLE.
6. ALL CONNECTIONS TO BE GROUNDED, CONNECTED OR BONDED MUST BE MADE TO CLEAN AND BRIGHT METAL SURFACES.
7. ELECTRICAL CONTRACTOR SHALL VERIFY GROUND CONNECTION POINTS ON COMPRESSOR AND DRYER SKIDS.
8. UNDERGROUND GROUND WIRE SHALL BE A MINIMUM OF 30 INCHES BELOW FINISHED GRADE.
9. GROUNDING SHALL BE PERFORMED AS SPECIFIED IN THE PER NEC, ARTICLE 250.
10. GROUND WIRES THRU CONCRETE SHALL HAVE A SLEEVE THAT EXTENDS 4" ABOVE GRADE. THE SLEEVES SHALL BE SCHEDULE 40 PVC PIPE FILLED WITH GE RTV SILICONE, AFTER GROUND WIRE HAS BEEN INSTALLED.
11. #4/0 BARE COPPER GROUND RING WIRE SHALL BE BURIED AT A DEPTH THE EARTH'S SURFACE OF NOT LESS THAN 30" WITH POWER CONDUITS AND CONTROL CONDUITS.
12. USE COUPLING AND DRIVING STUD TO DRIVE GROUND ROD TO AVOID MUSHROOMING.
13. BOND TOGETHER ALL CONDUIT STUB-UPS IN SAME LOCATION AND CONNECT TO MAIN GROUND CABLE.
14. THE NEW GROUNDING SYSTEM SHALL BE TESTED TO SHOW A RESISTANCE TO GROUND OF NO MORE THAN 25 OHMS. GROUND TESTS CALLED FOR IN THIS NOTE SHALL BE CARRIED OUT USING A "DEDICATED GROUND TESTER".
15. REMOVABLE GUARD POSTS HAVE SUBSTANTIAL CONCRETE FOOTING. ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF GROUND LOOP TO AVOID THESE FOOTINGS.
16. EACH VESSEL SHALL BE GROUNDED.
17. ALL CONDUITS IN PULL BOXES SHALL BE BONDED TOGETHER AND CONNECTED TO THE MAIN GROUND LOOP WITH #2 AWG COPPER WIRE.

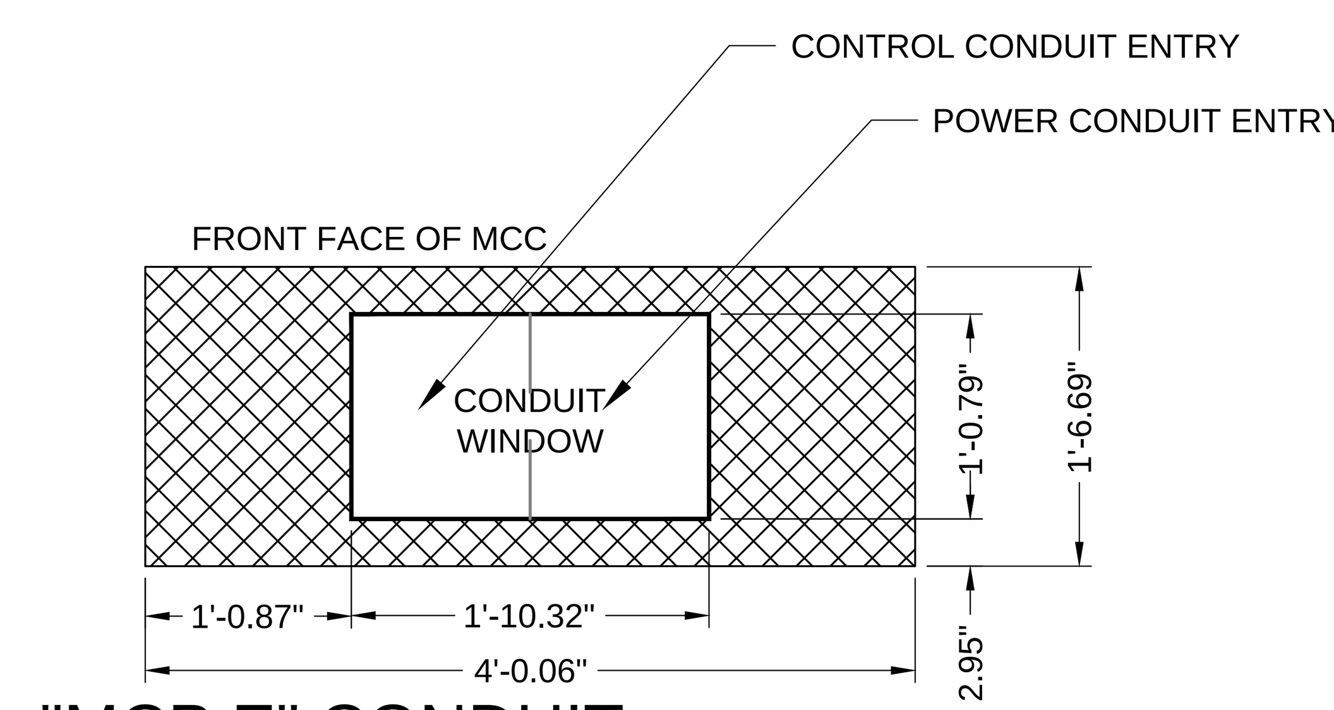


TIME-FILL GROUNDING 2 E-2.0
N.T.S.

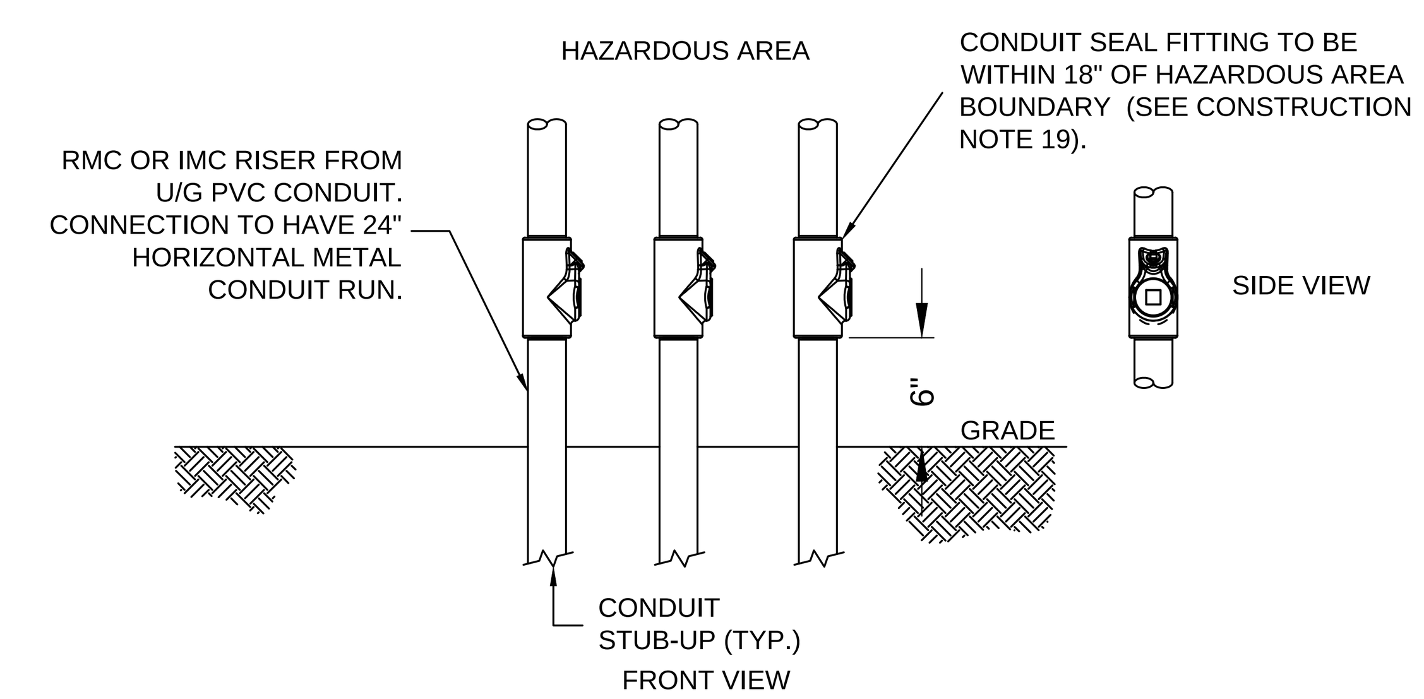


ITEM	QTY	DESCRIPTION
1	1	CONNECTOR, GROUND, BURNDY, TYPE GAR OR EQUAL
2	12"	BRAID, COPPER, FLEXIBLE, BURNDY TYPE B
3	1	CONNECTOR, GROUND, BURNDY, FOR COPPER BRAID, BURNDY TYPE GG

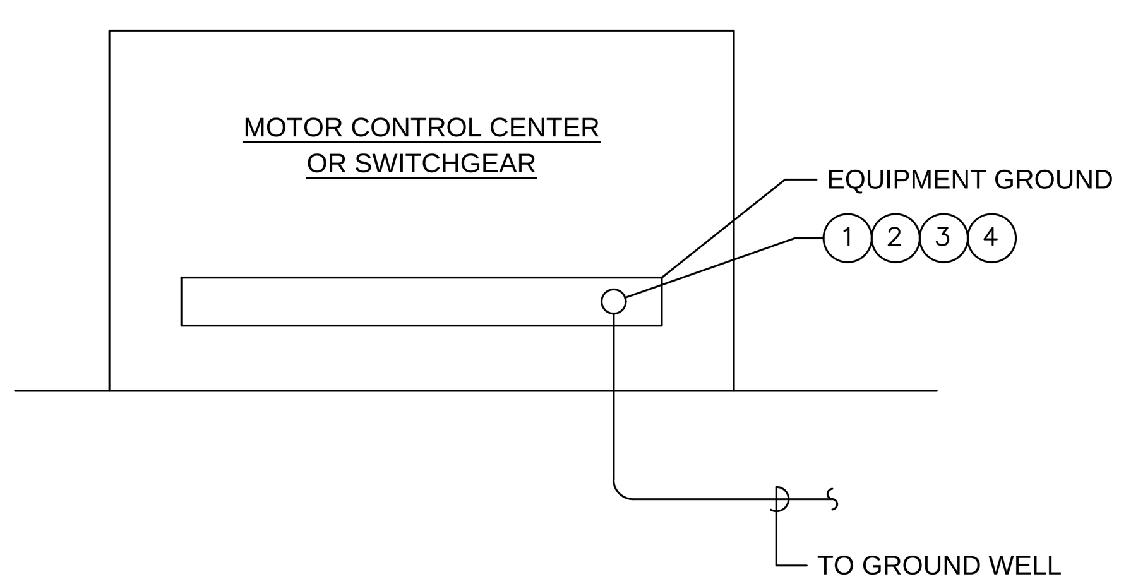
GATE POST 5 E-2.0
N.T.S.



"MCP E" CONDUIT WINDOW 9 E-2.0
N.T.S.

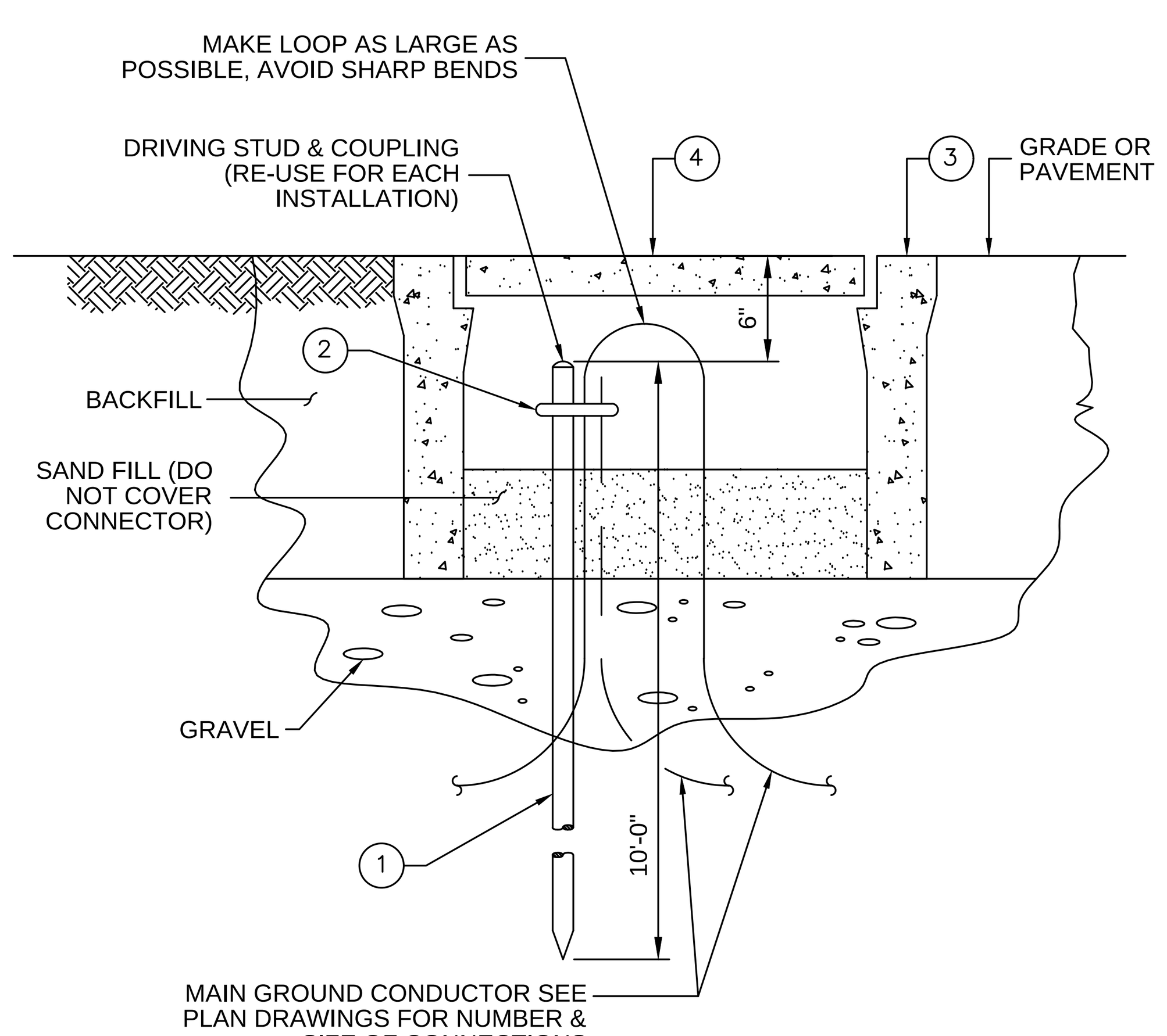


CONDUIT SEAL AT STUBUP 8 E-2.0
N.T.S.



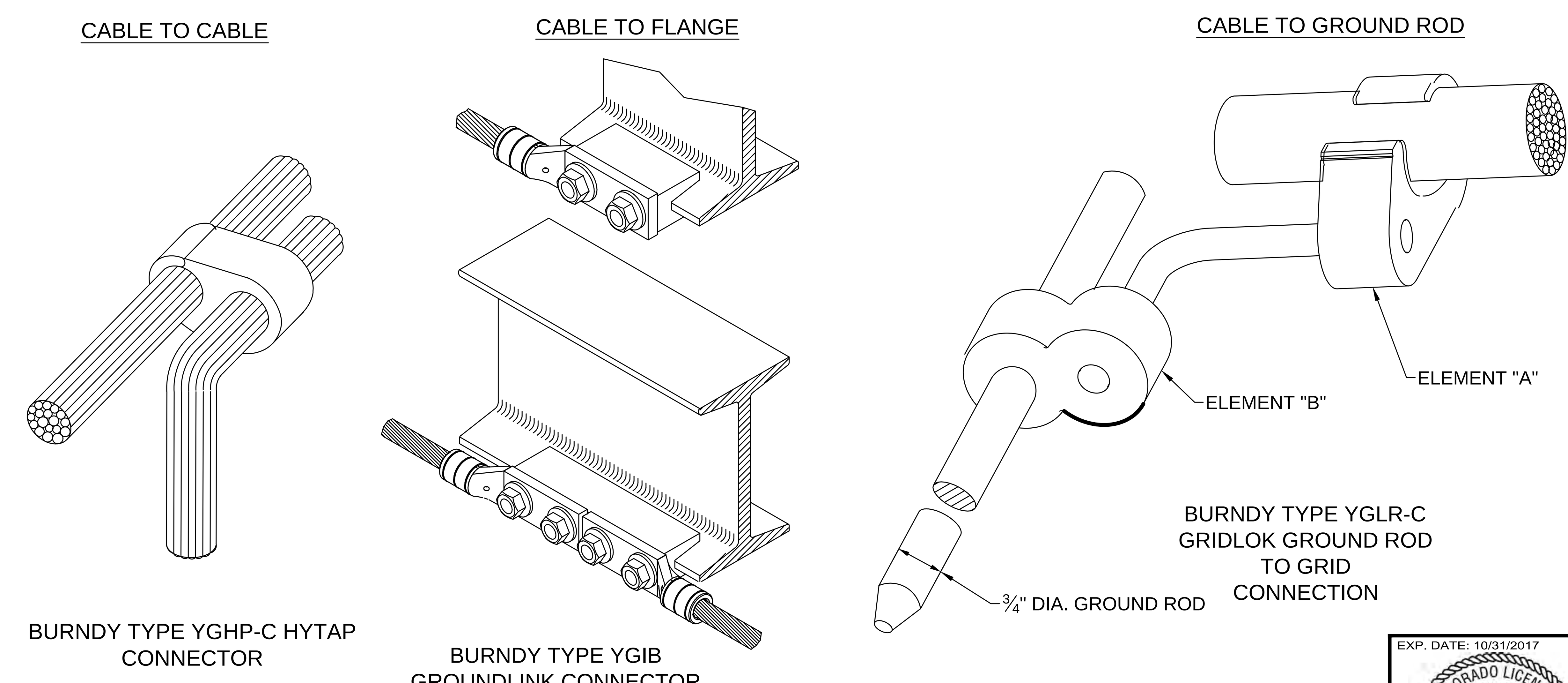
ITEM	QTY	DESCRIPTION
1	2	LUG, #4/0 CABLE, COMPRESSION TYPE
2	2	BOLT, 1/2"-13x1", SILICON BRONZE
3	2	LOCKWASHER, 1/2", SILICON BRONZE
4	2	NUT, HEX, 1/2"-13, SILICON BRONZE

EQUIPMENT GROUND BUS DETAIL 1 E-2.0
N.T.S.



ITEM	QTY	DESCRIPTION
1	-	SECTIONAL GROUND ROD, 3/4"x10'-0", COPPER CLAD STEEL
2	-	CONNECTOR, 3 #4/0 THRU 250KCMIL TO 3/4" ROD
3	-	CONCRETE BOX, 10"x17"x12" DEEP
4	-	BOX COVER (CONCRETE), MARKED "GROUND"

DETAIL - GROUND WELL 4 E-2.0
N.T.S.



GROUNDING CONNECTION DETAIL 7 E-2.0
N.T.S.

EXP. DATE: 10/31/2017
COLORADO LICENSED PROFESSIONAL ENGINEER RICHARD L. REMILLARD 0047005
DATE SIGNED:

REV	DATE	REVISIONS	BY
0	05/15/2017	ISSUED FOR PERMIT SUBMITTAL	HVT

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CNG FUELING FACILITY
GRAND VALLEY TRANSIT
333 WEST AVENUE
GRAND JUNCTION, CO 81501
ELECTRICAL DETAILS

ASSET NO: 160-11-17307.02.00

DATE	DESIGNED BY	HVT
05/01/2017	CHECKED BY	MES
	APPROVED BY	RLR

SCALE: AS NOTED

SHEET: E-4.0

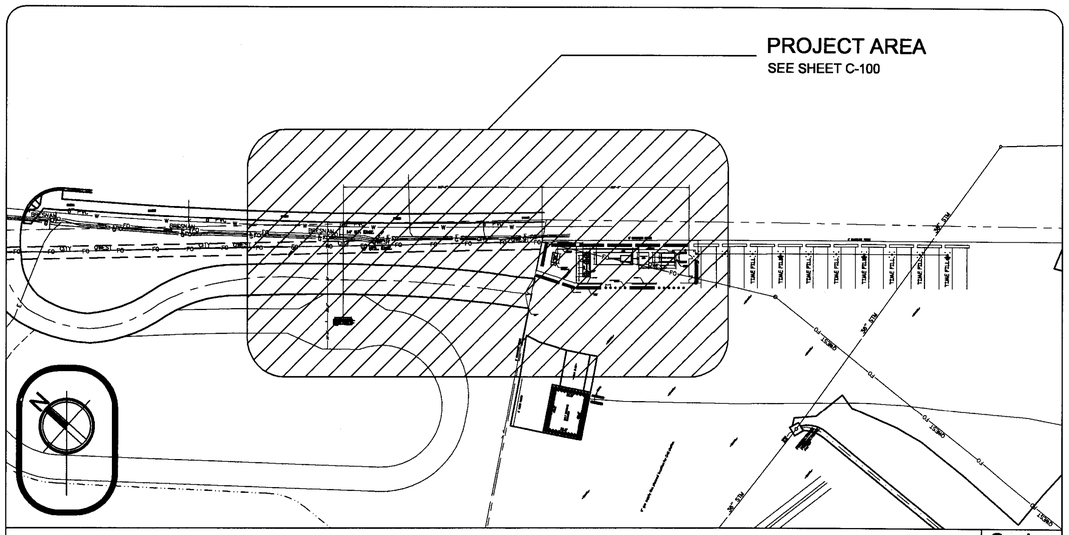
W:\Engineering Projects - Current\Grand Junction, CO - Grand Valley Transit (20820.00)\2.0 Drawings and Engineering\018-E04-ELECTRICAL SECTIONS AND DETAILS.dwg - PLOTTED: May 12, 2017 - 1:30pm

CITY OF GRAND JUNCTION, CO

UPGRADE FOR FAST FILL TO EXISTING CNG STATION

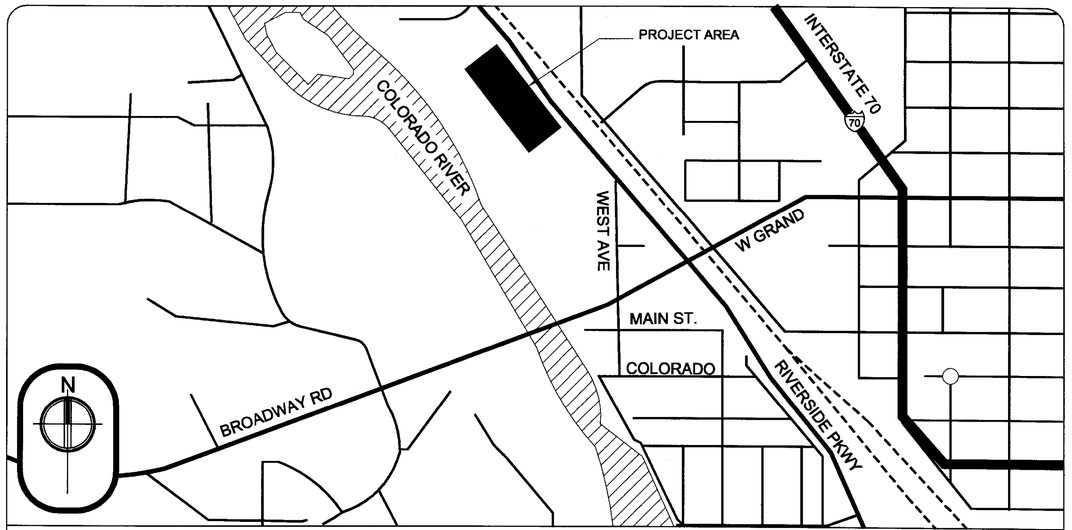
333 WEST AVENUE

GRAND JUNCTION, CO 81501



{ Project Area }

Scale
N.T.S.



{ Vicinity Map }

Scale
N.T.S.

Project Summary:

Project Summary:

City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

Project Description:

Upgrade for Fast Fill to existing CNG Station

Equipment:

-CNG Compressor 1-58 CFM GESI Natural Gas Compressor Skid
-3 x CNG Storage Tanks
-Priority Panel

Fast Fill:

-Dual GESI/Kraus Fast Fill dispenser dual hose 3600 PSI
-Card Reader Fuelmaster

ALL EQUIPMENT PER SUBMITTAL DOCUMENTS

General Notes:

1. The contractor shall verify and be responsible for; all contract documents, omissions and/or conflicts between various elements of contract documents, and all dimensions elevations and conditions at the site.
2. Contractor is responsible for any and all permits required for this project.
3. Contractor is responsible for the project design compliant with the scope of work (this page).
4. All work shall conform to the minimum standards of all regulating agencies having jurisdiction over any or all portions of the work including the state of california.
5. All work to conform to the best practices prevailing in the various trades at the time of the work.
6. Specific notes and details shall take precedence over general notes and typical details. do not scale dimensions from drawings.
7. It is the responsibility of the contractor to locate all existing utilities whether shown on these drawings or not, and to protect them from damage. the contractor shall bear all cost of repair or replacement due to such damage in the execution of his work.
8. Contractor shall assume sole and complete responsibility for the job site conditions during the course of the construction of the project, including safety of all persons and not limited to normal working hours. the contractor shall indemnify and hold the owner and the engineer harmless from any and all liability real or alleged in the connection with the performance of work on the project, excepting for liability rising from the sole negligence of the owner or the engineer.
9. The contract structural drawings and specifications represent the finished structure. they do not indicate the method of construction. the contractor shall provide all measures necessary to protect the structure during construction. such measures shall include but are not limited to bracing, shoring for loads due to construction equipment, temporary structural and partial structures, and partially completed work, etc. observation visits to the site by the structural engineer shall not include inspection of these protection measures.
10. Contractor shall verify all measurements and take all necessary field measurements prior to fabrication.
11. Contractor's scope of work includes the coordinating of the work of all subcontractors and consultants.
12. Any damage to the existing building and its contents during the execution of this work shall be repaired or restored to original condition at the contractor's expense.
13. Contractor shall maintain a set of as-built drawings of all work as it progresses on the job site.
14. Access to fire safety equipment must be provided and maintained serviceable prior to and during construction.
15. Contractor to remove all excavated material and debris.
16. New concrete to be 2500 PSI strength after 28 days.
17. Parking lot striping is the responsibility of others.

Build Codes:

The system shall be designed in full compliance with the latest edition of the applicable sections of the following codes, standards, and guidelines. Where conflict exists, contractor shall follow the most stringent requirements. in case of a conflict between the uniform fire code, national fire prevention association and Cal-OSHA standards, the most stringent condition shall apply:

2010 National Fire Protection Association (NFPA)-#52-2010
National Electric Code (NEC)
Underwriters Laboratory (UL) or Factory Mutual (FM)

Owner:
City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

Revisions:

01	11/12/2010	80% Preliminary
02	11/19/10	90% Preliminary
03	11/30/10	Final

Drawn By:	J.V.
Checked By:	B.B.
Date:	11/30/10
Scale:	As Noted
Job No.	

Site Information:

GRAND JUNCTION
UPGRADE FOR FAST FILL TO EXISTING CNG STATION
333 WEST AVENUE
GRAND JUNCTION, CO 81501

Seal:

Plans Prepared By:

GESI
GAS EQUIPMENT SYSTEMS, INC.
Specialists in Gas Compression Equipment for NGV's
8753 LION STREET, RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 466-6920
LICENSE# 783360

Sheet Title:

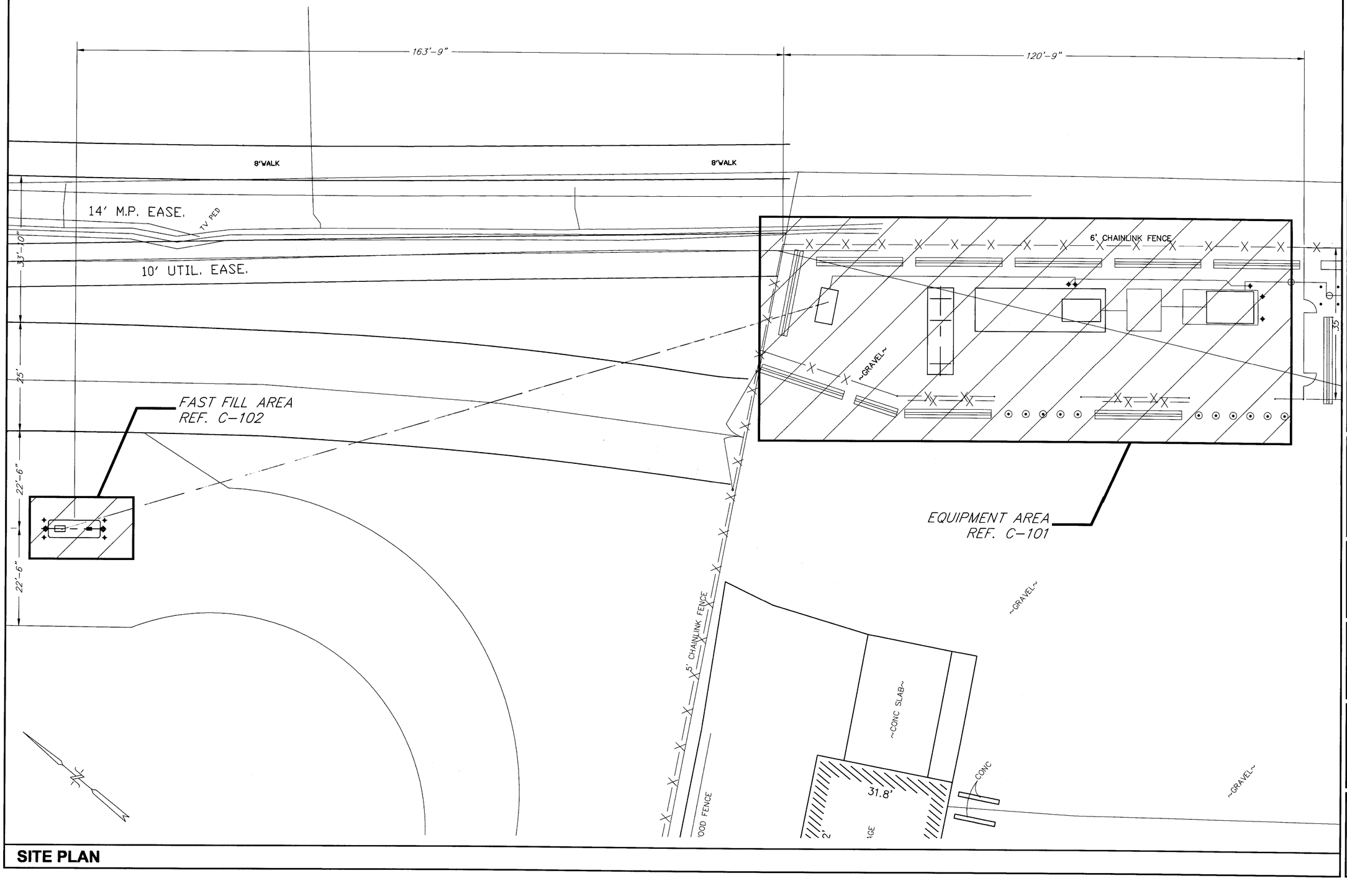
COVER SHEET

Sheet Number:

CS-100

CONSTRUCTION WARNING:

THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS WERE MADE BY SEARCHING AVAILABLE EXISTING RECORDS. HOWEVER, NO GUARANTEE IS MADE THAT SUBSTRUCTURES OR THEIR LOCATIONS ARE EXACT. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ALL UTILITY LINES INCLUDING THOSE NOT SHOWN OR NOT ON RECORD BY CALLING USA 48 HOURS BEFORE EXCAVATING. CONTRACTOR SHALL EXPOSE AND POT HOLE (HAND DIG) ALL EXISTING UTILITIES WITHIN CONSTRUCTION ZONE.



SITE PLAN

Owner:

City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

Revisions:

01	11/12/2010	80% Preliminary
02	11/19/10	90% Preliminary
03	11/30/10	Final

Drawn By:	J.V.
Checked By:	B.B.
Date:	11/30/10
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Job No.	

Site Information:

GRAND JUNCTION

UPGRADE FOR FAST FILL TO EXISTING CNG STATION
333 WEST AVENUE
GRAND JUNCTION, CO 81501

Seal:

Plans Prepared By:

GAS EQUIPMENT SYSTEMS, INC.
Specialists in Gas Compression Equipment for NGV's
8753 LION STREET
RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 466-6620
LICENSE# 783360

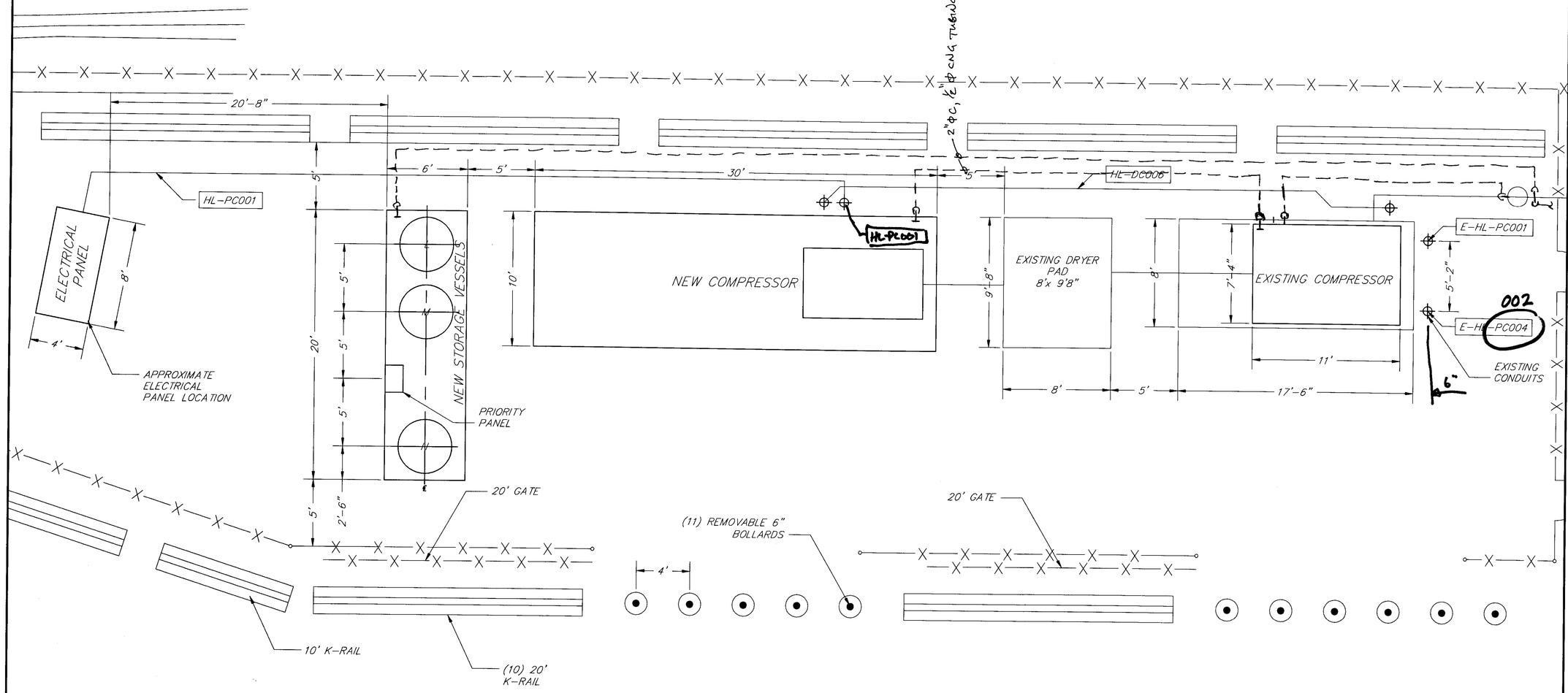
Sheet Title:

SITE LAYOUT

Sheet Number:

C-100

THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS WERE MADE BY SEARCHING AVAILABLE EXISTING RECORDS. HOWEVER, NO GUARANTEE IS MADE THAT SUBSTRUCTURES OR THEIR LOCATIONS ARE EXACT. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ALL UTILITY LINES INCLUDING THOSE NOT SHOWN OR NOT ON RECORD BY CALLING USA 48 HOURS BEFORE EXCAVATING. CONTRACTOR SHALL EXPOSE AND POT HOLE (HAND DIG) ALL EXISTING UTILITIES WITHIN CONSTRUCTION ZONE.



SITE PLAN

SCALE 1/4" = 1'-0" (0 1' 2' 4')

1

Owner:
City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

Revisions:

01	11/12/2010	80% Preliminary
02	11/19/10	90% Preliminary
03	11/30/10	Final

Drawn By:	J.V.
Checked By:	B.B.
Date:	11/30/10
Scale:	As Noted
Job No.	

Site Information:

GRAND JUNCTION

UPGRADE FOR FAST FILL TO EXISTING CNG STATION
333 WEST AVENUE
GRAND JUNCTION, CO 81501

Seal:

Plans Prepared By:

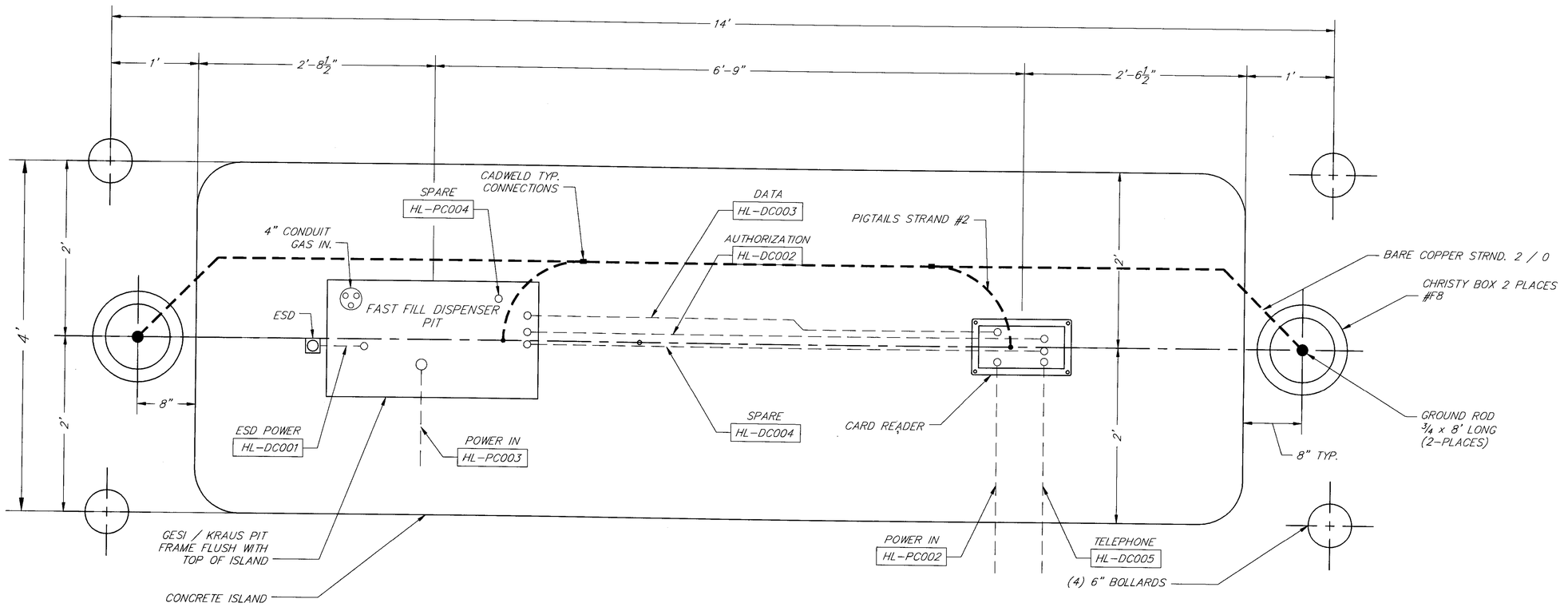
GAS EQUIPMENT SYSTEMS, INC.
Specialists in Gas Compression Equipment for NGV's
8753 LION STREET
RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 466-6826
LICENSE# 783360

Sheet Title:

CIVIL LAYOUT

Sheet Number:

C-101

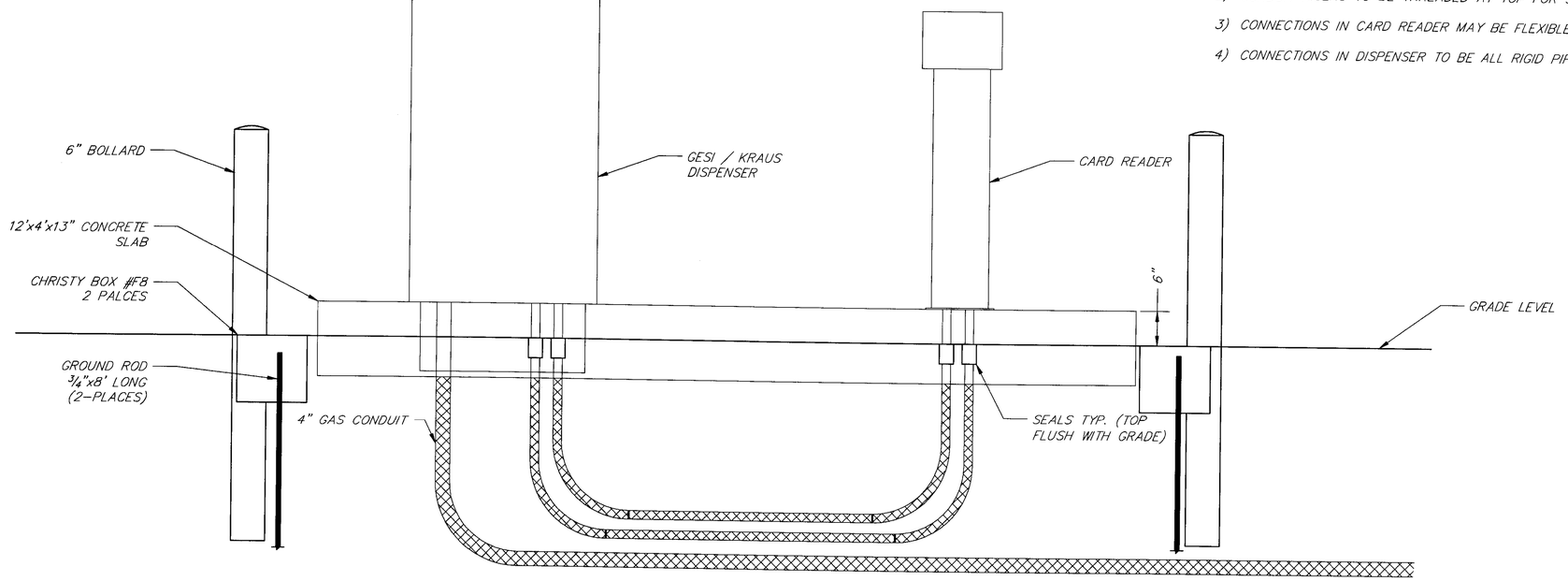


FAST FILL ISLAND LAYOUT

SCALE N.T.S. 1

NOTE:

1) TRANSITION FROM PVC TO RIGID STEEL TO BE HORIZONTAL.
2) CONDUIT RISERS TO BE THREADED AT TOP FOR SEALS.
3) CONNECTIONS IN CARD READER MAY BE FLEXIBLE CONDUIT UL.
4) CONNECTIONS IN DISPENSER TO BE ALL RIGID PIPE.



FAST FILL ISLAND ELEVATION

SCALE N.T.S. 1

Owner:
City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

Revisions:

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Checked By:	B.B.
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RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 466-6920
LICENSE# 783360

Sheet Title:

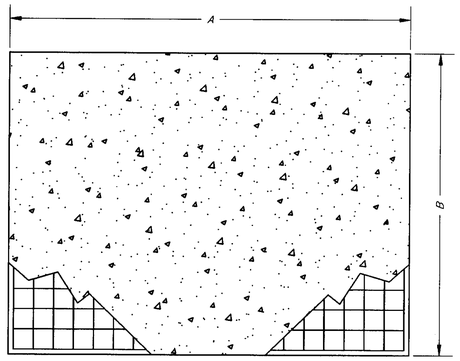
FAST FILL LAYOUT

Sheet Number:

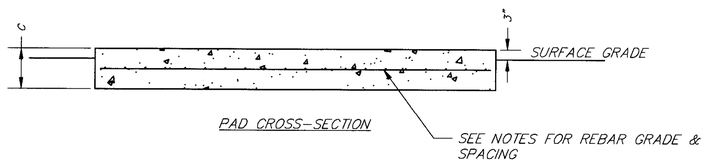
C-102

EQUIPMENT PAD FOUNDATIONS LIST

ID	DESCRIPTION	"A"	"B"	"C"	BOLT	MATTE LOCATION
P1	STORAGE VESSEL	20'-0"	6'0"	18"	3/4"Ø	#5-8" O/C-MID. HT.
P3	FAST FILL DISPENSER	12'-0"	4'-0"	13"	N/A	#5-12" O/C-MID. HT.
P3	CARD READER	12'-0"	4'-0"	13"	3/8"Ø	#5-12" O/C-MID. HT.



PAD PLAN VIEW



PAD CROSS-SECTION

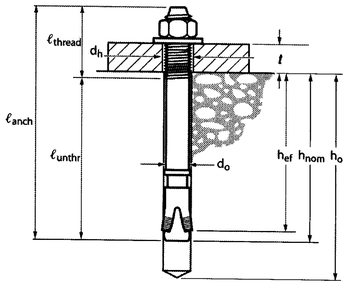
EQUIPMENT PAD NOTES:
1. CONCRETE DESIGNED FOR 2500 PSI AFTER 28 DAYS, USE 3000 PSI, NO SPECIAL INSPECTION REQUIRED. 2% SLOPE WITH BROOM FINISH.
2. POSITION REBAR NO CLOSER THAN 3" TO EDGE.
3. ALL EQUIPMENT WILL BE ANCHORED AFTER PLACEMENT.

SLAB DETAIL

SCALE N.T.S. | 1

SETTING INFORMATION	Symbol	Units	Nominal anchor diameter (in.)													
			3/8			1/2			5/8				3/4			
Anchor O.D.	d_o	in. (mm)	0.375 (9.5)			0.5 (12.7)			0.625 (15.9)				0.75 (19.1)			
Nominal bit diameter	d_{bit}	in.	3/8			1/2			5/8				3/4			
Effective min. embedment	h_{ef}	in. (mm)	2 (51)			2 (51)	3-1/4 (83)		3-1/8 (79)	4 (102)			3-3/4 (95)	4-3/4 (121)		
Min. hole depth	h_o	in. (mm)	2-5/8 (67)			2-5/8 (67)	4 (102)		3-3/4 (95)	4-3/4 (121)			4-5/8 (117)	5-3/4 (146)		
Min. thickness of fixture[1]	t_{min}	in. (mm)	1/4 (6)			3/4 (19)	1/4 (6)		3/8 (9)	3/4 (19)			1/8 (3)	1-5/8 (41)		
Max. thickness of fixture	t_{max}	in. (mm)	2-1/4 (57)			4 (101)	2-3/4 (70)		5-5/8 (143)	4-3/4 (121)			4-5/8 (117)	3-5/8 (92)		
Installation torque	T_{inst}	ft-lb (Nm)	25 (34)			40 (54)			60 (81)				110 (149)			
Min. dia. of hole in fixture	d_h	in. (mm)	7/16 (11.1)			9/16 (14.3)			11/16 (17.5)				13/16 (20.6)			
Available anchor lengths	l_{anch}	in. (mm)	3 (76)	3-3/4 (95)	5 (127)	3-3/4 (95)	4-1/2 (114)	5-1/2 (140)	7 (178)	4-3/4 (121)	6 (152)	8-1/2 (216)	10 (254)	5-1/2 (140)	8 (203)	10 (254)
Threaded length including dog point	l_{thread}	in. (mm)	7/8 (22)	1-5/8 (41)	2-7/8 (73)	1-5/8 (41)	2-3/8 (60)	3-3/8 (86)	4-7/8 (178)	1-1/2 (38)	2-3/4 (70)	5-1/4 (133)	6-3/4 (171)	1-1/2 (38)	4 (102)	6 (152)
Unthreaded length	l_{unthr}	in. (mm)	2-1/8 (54)			2-1/8 (54)			3-1/4 (83)				4 (102)			
Installation embedment	h_{nom}	in. (mm)	2-1/4 (57)			2-3/8 (60)		3-5/8 (92)		3-5/8 (92)		4-1/2 (114)		4-3/8 (111)		5-3/8 (137)

1 The minimum thickness of the fastened part is based on use of the anchor at minimum embedment and is controlled by the length of the thread. If a thinner fastening thickness is required, increase the anchor embedment to suit.



EQUIPMENT INSTALLATION NOTES:
1. USE HILTI KWIK BOLT TZ ANCHORS.
2. TRANSFER DRILL HOLES THRU EQUIPMENT MOUNTING BRACKETS. DRILL HOLE SAME SIZE AS THE NOMINAL DIAMETER OF THE KWIK BOLT TZ ANCHOR. HOLE DEPTH MUST EXCEED THE ANCHOR EMBEDMENT BY AT LEAST 1/4".
3. CLEAN OUT DRILLED HOLE USING COMPRESSED AIR.
4. DRIVE THE ANCHOR INTO THE HOLE USING A HAMMER. THE ANCHOR MUST BE DRIVEN UNTIL AT LEAST FOUR (4) THREADS ARE BELOW THE SURFACE OF THE MOUNTING BRACKET.
5. TIGHTEN THE NUT TO THE RECOMMENDED INSTALLATION TORQUE.

EQUIPMENT ANCHOR INSTALLATION INSTRUCTIONS

SCALE N.T.S. | 2

Owner:
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Checked By:	B.B.
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333 WEST AVENUE
GRAND JUNCTION, CO 81501

Seal:

Plans Prepared By:

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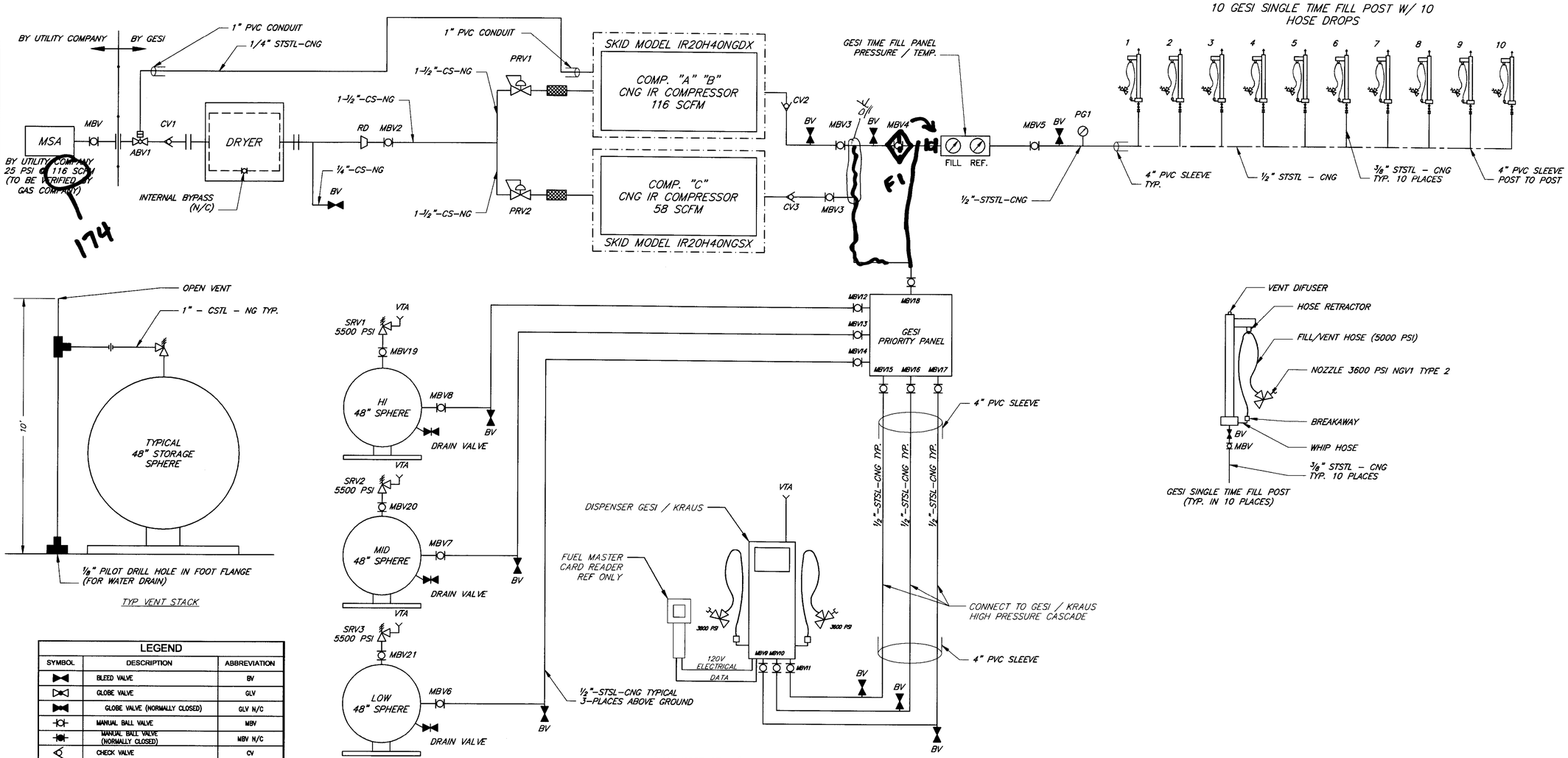
Specialists in Gas Compression Equipment for NGV's
8753 LION STREET, RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 466-8920
LICENSE# 783360

Sheet Title:

CONCRETE SPECS

Sheet Number:

C-200



DUAL HOSE GESI / KRAUS FAST-FILL DISPENSER 3600 PSI BOTH HOSE

LEGEND

SYMBOL	DESCRIPTION	ABBREVIATION
	BLEED VALVE	BV
	GLOBE VALVE	GLV
	GLOBE VALVE (NORMALLY CLOSED)	GLV N/C
	MANUAL BALL VALVE	MBV
	MANUAL BALL VALVE (NORMALLY CLOSED)	MBV N/C
	CHECK VALVE	CV
	NEEDLE VALVE	NV
	NEEDLE VALVE (NORMALLY CLOSED)	NV N/C
	PLUG VALVE	PV
	PLUG VALVE (NORMALLY CLOSED)	PV N/C
	3-WAY VALVE	3WV
	PRESSURE REGULATOR	PRV
	GAS ACTIVATED VALVE	GAV
	SOLENOID VALVE (2-WAY)	SV
	SOLENOID VALVE (3-WAY)	3WSV
	REDUCER	RD
	RELIEF VALVE	RV OR SRV
	FLEXIBLE HOSE	FH
	CAP	CP
	PLUG	PLG
	UNION	UN
	LOCAL INSTRUMENT OR GAUGE	PG
	PANEL MOUNTED INSTRUMENT OR GAUGE	PM
	POINT OF CONNECTION	PC
	FLANGE	FG
	BELOW GRADE	–
	ACTUATED BALL VALVE	ABV

TABLE

SYMBOL	QTY	DESCRIPTION	GESI PART NUMBER
MBV1	1	BALL VALVE ¼"	BY UTILITY
CV1	1	CHECK VALVE	KF SERIES 35
MBV2	1	BALL VALVE 1-1/2"	APOLLO 489-100
MBV3	1	BALL VALVE ½"	7223G8Y
BV	9	BLEED VALVE	667098Y316
CV2-CV3	1	½" CHECK VALVE	625398Y316
PG1	1	PRESSURE GAUGE	K6K6GF-6000
MBV4 – MBV11	9	BALL VALVE ½" GYROLOK OR EQUAL	7223G8Y
SRV1 – SRV3	3	SAFETY RELIEF VALVE 5500 PSI (ALLIED)	SUPPLIED WITH 48" VESSEL
MBV12 – MBV18	7	BALL VALVE (HALE HAMILTON)	PART OF PRIORITY PANEL
MBV 19 – MBV21	3	1" BALL VALVE FEMALE NPT.	HBEV766DTSE1
ABV	1	ACTUATED VALVE	JAMESBURY
–	–	–	–
–	–	–	–

PIPING TABLE

ABBREVIATION	DESCRIPTION
PLP	PE PIPE (PLASTIC)
STSTL	STAINLESS STEEL
NG	NATURAL GAS (INLET)
CS	CARBON STEEL SCH 40.
CNG	COMPRESSED NATURAL GAS
CS2	CARBON STL SCH 80
PVC	PVC PIPE

TYPICAL EXAMPLE – 2"-PLP-NG
IS 2" PIPE X PE MATERIAL X NATURAL GAS.

TIME FILL DETAILS

SYMBOL	QTY	DESCRIPTION	GESI PART NUMBER
MBV	10	BALL VALVE ¼"	7115G4Y
BV	10	BLEED VALVE	6610M6Y316
–	–	–	–
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Owner:
City Of Grand Junction
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Grand Junction, CO 81501

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03	11/26/10	1/4" CNG Line Added
04	11/30/10	Final

Drawn By:	J.V.
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Plans Prepared By:

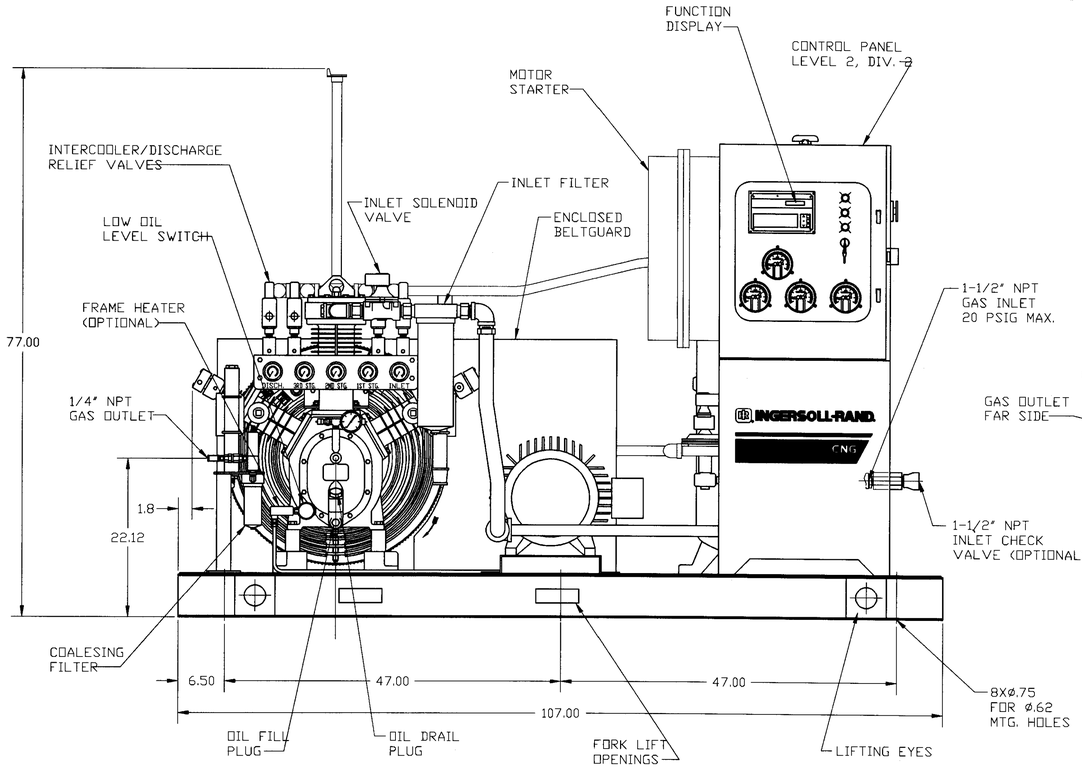
GAS EQUIPMENT SYSTEMS, INC.
Specialists in Gas Compression Equipment for NGV's
8753 LION STREET
RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 484-9600
LICENSE# 783360

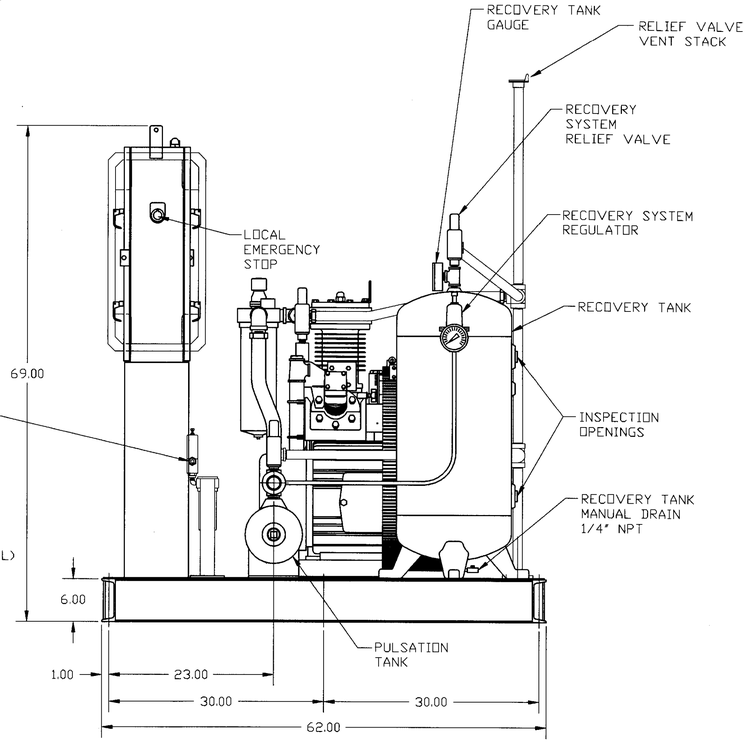
Sheet Title:

P&ID

Sheet Number:

M-100





NOTES:
1. FOUNDATION OR FLOOR MUST BE LEVEL AND SUPPORT THE UNIT EQUALLY; IF NECESSARY SHIM OR GROUT.
2. FOUNDATION BOLTS SHOULD PROJECT THRU NUTS AT LEAST 1/2" TO ALLOW FOR LEVELING.
3. APPROXIMATE NET WEIGHT: 3,100 LBS.
4. SKID ELECTRICS CLASS I, DIVISION 2.
5. ALL DIMENSIONS ±.12 UNLESS OTHERWISE NOTED.

INGERSOLL-RAND Co.
RECIPROCATING COMPRESSOR DIVISION
SMALL COMPRESSOR BUSINESS UNIT
CAMPBELLSVILLE, KY

REF. SIMPLEX CNG, (LEVEL II, DIV. 2)

TITLE
GENERAL ARRANGEMENT, 20H40NGSX

Owner:
City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

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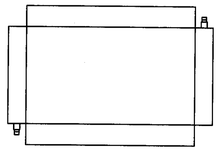
RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 466-6626
LICENSE# 783360

Sheet Title:

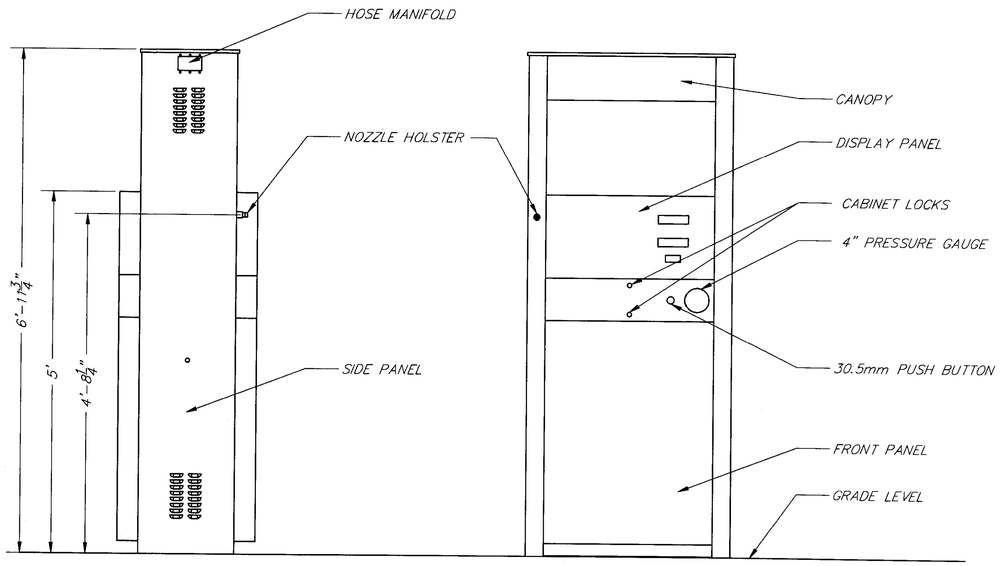
COMPRESSOR

Sheet Number:

M-200

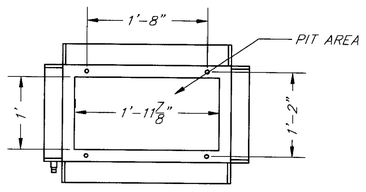


TOP VIEW



SIDE VIEW

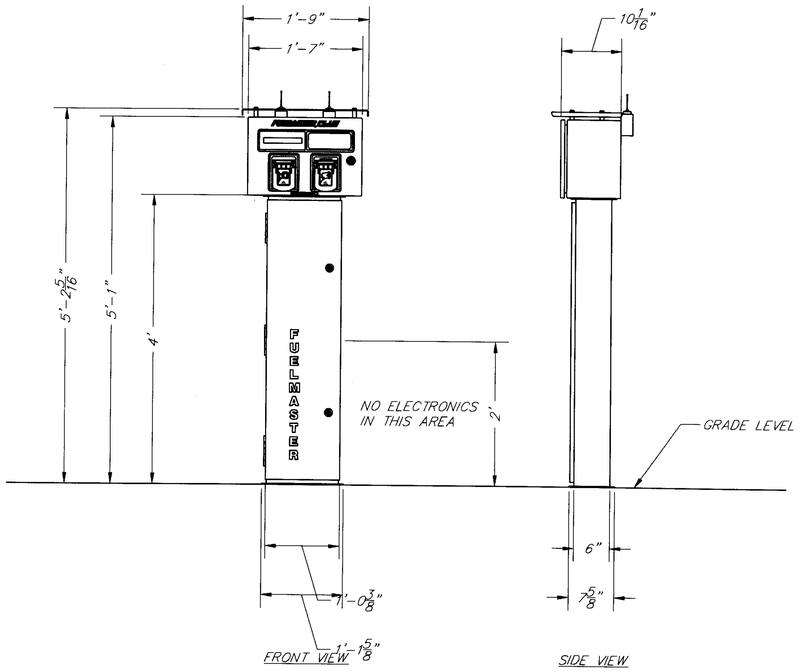
FRONT VIEW



BOTTOM VIEW

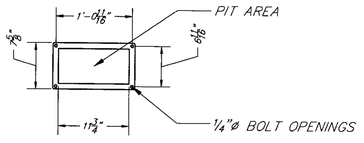
KRAUS /GESI DISPENSER

NOTE:
THIS DRAWING SHOWS A GEN3 CABINET WITH FRONT CONTROLS EQUIPPED WITH TYPICAL SIDE PANELS, CANOPY COVER & BRACKETS, DASH PANELS AND DISPLAY PANELS.



FRONT VIEW

SIDE VIEW



MOUNTING BRACKET

FUELMASTER CARD READER

Owner:
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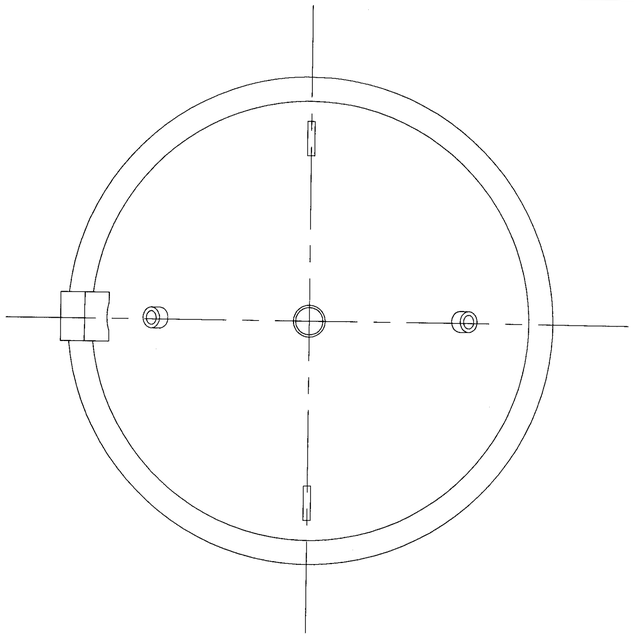
LICENSE# 783360

Sheet Title:

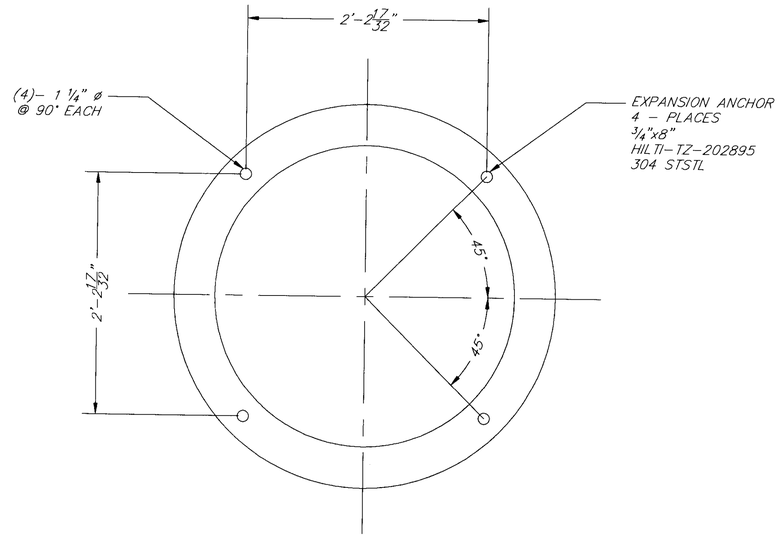
DISPENSER / CARD READER

Sheet Number:

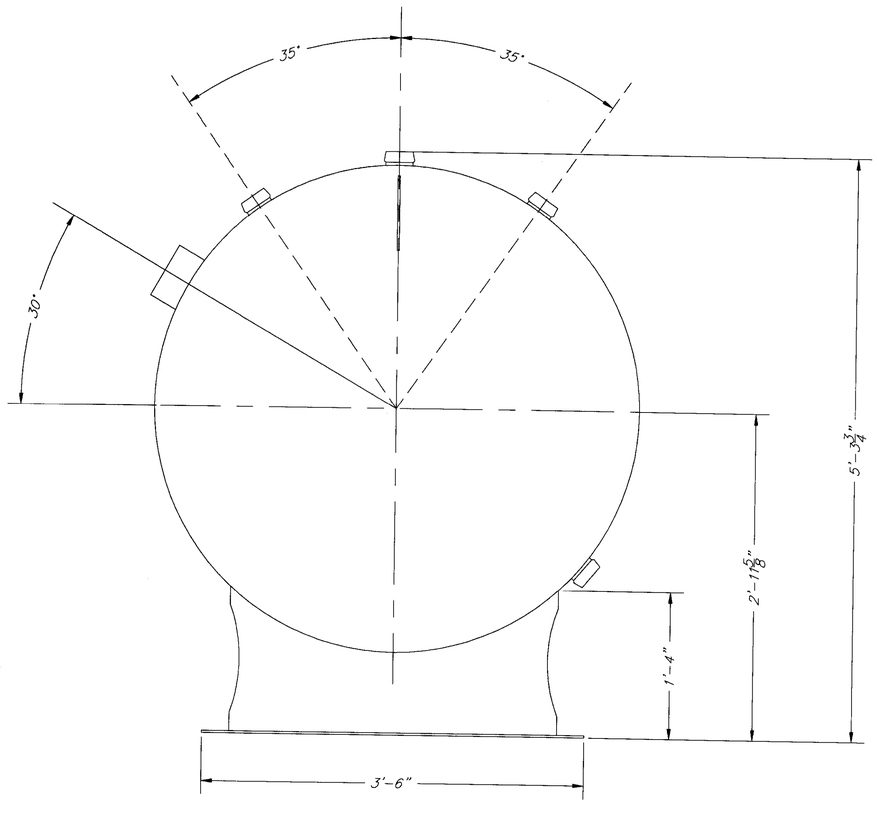
M-300



TOP VIEW



MOUNTING
LAYOUT



SIDE VIEW

CNG STORAGE

Owner:

City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

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LICENSE# 783380

Sheet Title:

CNG STORAGE

Sheet Number:

M-400

ELECTRICAL POWER CONDUIT SCHEDULE

#	SIZE	WIRE	FROM	TO	NOTES
E-NHL-UTILITY.1	(2) 3"	4 x #350MCM 1 X1 (GRD) IN EACH	UTILITY TRANSFORMER	CT's & METER	VERIFY ALL REQUIREMENTS WITH LOCAL UTILITY COMPANY
E-NHL-UTILITY.2	(2) 3"	4 x #350MCM 1 X1 (GRD) IN EACH	CT's & METER	SERVICE "MSCG"	-
E-HL-PC001	1 1/4"	3 x #4 1 x#8 (GRD)	SERVICE "MSCG"	COMPRESSOR #1	-
E-HL-PC002	1 1/4"	3 x #4 1 x#8 (GRD)	SERVICE "MSCG"	COMPRESSOR #2	-
E-HL-PC003	-	-	MINI PANEL "LV1"	AREA LIGHT FIXTURES	REFER TO ES-1-3 FOR ALL CONDUIT, CONDUCTOR AND CIRCUIT BREAKER REQUIREMENTS
E-NHL-PC001	1"	2 x #6 1 x#10 (GRD)	SERVICE "MSCG"	TRANSFORMER IN MINI PANEL "LV1"	-
E-NHL-PC002	3/4"	2 x #10 1 x#10	MINI PANEL "LV1"	AREA POLE LIGHTING	SEE SITE PLAN FOR LOCATIONS
HL-PC001	1 1/4"	3 x#4 1 x#8 (GND)	SERVICE "MSCG"	COMPRESSOR #3	-
HL-PC002	3/4"	2 x#12 1 x#12 (GND)	MINI PANEL "LV1"	CARD READER	-
HL-PC003	3/4"	3 x#12 1 x#12 (GND)	MINI PANEL "LV1"	FAST FILL DISPENSER	-
HL-PC004	3/4"	NOT APPLICABLE	MINI PANEL "LV1"	FAST FILL DISPENSER	VERIFY ALL REQUIREMENTS WITH LOCAL UTILITY COMPANY
HL-PC005	3/4"	3 x#12 1 x#12 (GND)	MINI PANEL "LV1"	FAST FILL ISLAND LIGHT	-

ELECTRICAL DATA CONDUIT SCHEDULE

#	SIZE	WIRE	FROM	TO	NOTES
E-HL-DC001	3/4"	2 x#16 1 x#16 (GND)	CNG CONTROL PANEL	EMERGENCY ESD PUSH BUTTONS	REMOTE LOCATION SEE E-100
HL-DC001	3/4"	2 x#16 1 x#16 (GND)	CNG CONTROL PANEL	EMERGENCY ESD PUSH BUTTONS	REMOTE LOCATION SEE E-100
HL-DC002	3/4"	5 X #14 (RD,RD,GN,BE,BE)	CARD READER	FAST FILL DISPENSER	-
HL-DC003	3/4"	2 x BELDEN #9180 OR EQUAL	FAST FILL DISPENSER	CARD READER	DATA / MONITORING
HL-DC004	3/4"	NOT APPLICABLE	CARD READER	FAST FILL DISPENSER	CONDUIT ONLY
HL-DC005	3/4"	(1) CAT5E CABLE	CARD READER	OWNER'S TELEPHONE BACKBOARD	COMMUNICATION
HL-DC006	3/4"	REQUIRED COMMUNICATION AND MONITORING CABLES	CNG CONTROL PANEL #1	CNG CONTROL PANEL #2	DATA / MONITORING

LOAD SUMMARY:

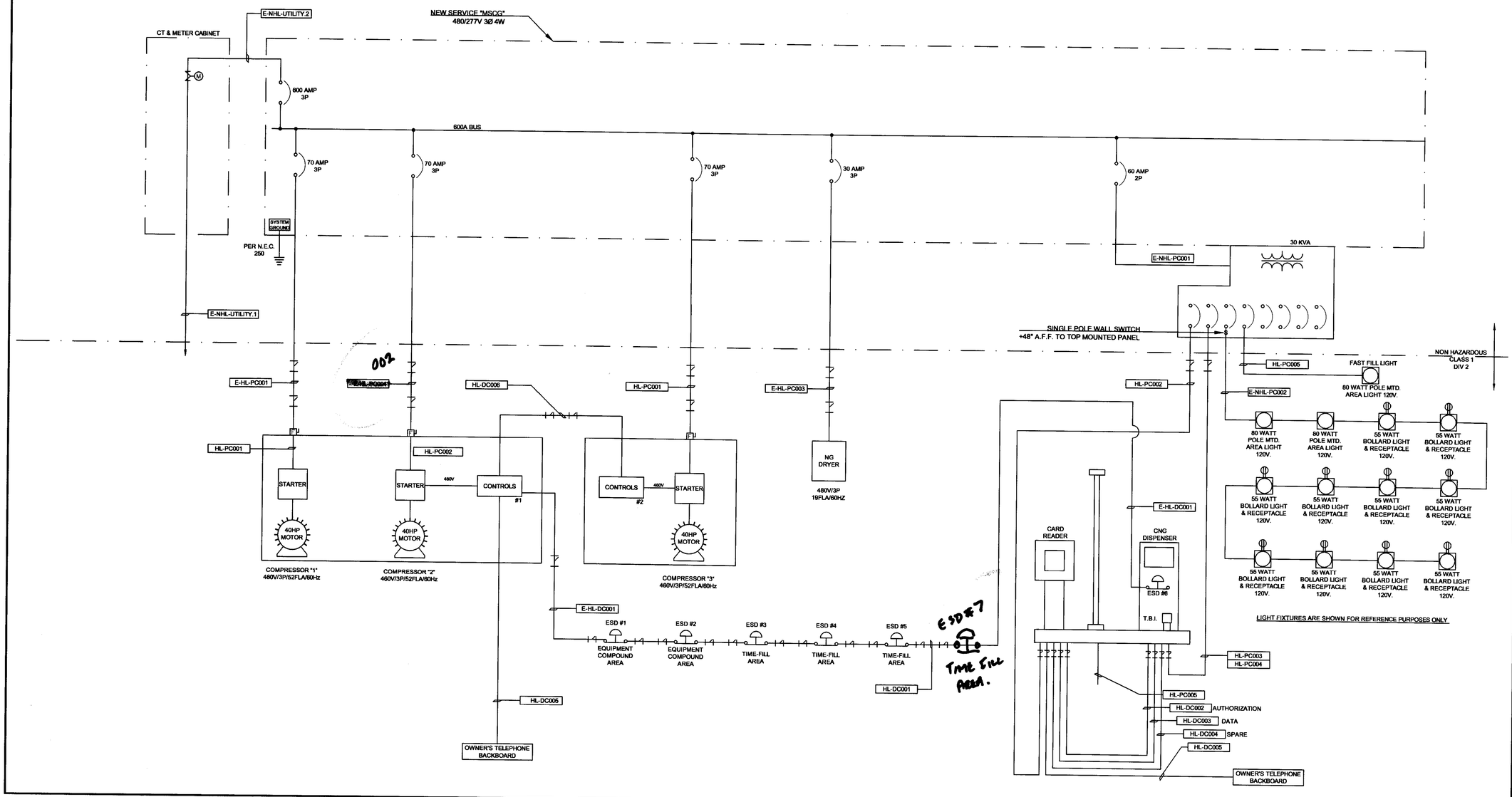
COMPRESSOR 1	=	[illegible] KVA
COMPRESSOR 2	=	43.9 KVA
COMPRESSOR 3	=	43.9 KVA
DRYER	=	15.8 KVA
MIN LOW VOLTAGE PANEL LV1	=	30.0 KVA
CONNECTED LOAD	=	177.0 KVA
43.4 KVA x 25% (LCL PER N.E.C.)	=	14.7 KVA
TOTAL LOAD	=	191.7 KVA

230.0 AMPS

@ 480/277V. 3Ø 4W.

NOTES:

1. ALL WIRE TO BE THWN, CU, STRANDED UNLESS OTHERWISE NOTED
2. ALL CALLOUTS NOTED WITH "N-HL, HL-PL & HL-DC" SHALL BE NEW AND SHALL FOR NEW ADDITIONS (COMPRESSOR #3 AND FAST FILL SYSTEM)
3. ALL SWITCHBOARDS CONFORM TO U.L., ANSI, AND NEMA STANDARDS
4. ALL CIRCUIT BREAKERS ARE LOCKABLE



Owner:

City Of Grand Junction
333 West Avenue
Grand Junction, CO 81501

Revisions:

01	11/12/2010	80% Preliminary
02	11/19/10	90% Preliminary
03	11/22/10	Updated Conduit Line
04	11/30/10	Final

Drawn By:	J.V.
Checked By:	B.B.
Date:	11/30/10
Scale:	As Noted
Job No.	

Site Information:

GRAND JUNCTION
UPGRADE FOR FAST FILL TO EXISTING CNG STATION
333 WEST AVENUE
GRAND JUNCTION, CO 81501

Seal:

Plans Prepared By:

GAS EQUIPMENT SYSTEMS, INC.
Specialists in Gas Compression Equipment for NGV's
8753 LION STREET
RANCHO CUCAMONGA, CA 91730
OFFICE: (909) 466-8620
LICENSE# 783360

Sheet Title:

ELECTRICAL SINGLE LINE DIAGRAM

Sheet Number:

E-100

	scfm Pri Dig	scfm Raw To CNG	scfm Pipline	% methane %CH4Avg	CNG GGE Gallons (GGE)	scfm Tailgas	scfm Gas To Flare
Total 7/14/20	78829	90824	36261	90.76	292.1	65755	288
Total 7/13/20	79448	86285	31223	89.28	247.4	59246	4935
Total 7/12/20	77360	80234	12550	86.80	96.7	21488	41319
Total 7/11/20	74545	80390	32849	90.82	264.8	56642	288
Total 7/10/20	79976	77558	31540	90.66	253.8	54978	225
Total 7/9/20	81925	91186	37330	90.79	300.8	65443	171
Total 7/8/20	82555	90563	36916	90.71	297.2	65852	24
Total 7/7/20	81577	89651	35859	90.71	288.7	65379	213
Total 7/6/20	81068	87647	33377	89.67	265.6	61267	2802
Total 7/5/20	81194	91789	569	76.63	3.9	1125	74417
Total 7/4/20	81155	83209	6224	84.16	46.5	10240	56495
Total 7/3/20	81067	94670	38387	90.78	309.3	64306	2038
Total 7/2/20	82961	87769	34529	91.25	279.7	59337	3071
Total 7/1/20	82525	82071	33430	90.82	269.5	57959	0
Total 6/30/20	81393	93263	34211	90.60	275.1	57534	8984
Total 6/29/20	81685	91153	30281	85.85	230.7	54343	13123
Total 6/28/20	81754	84709	7374	82.83	54.2	12834	55134
Total 6/27/20	81359	91965	30055	89.90	239.8	52131	15256
Total 6/26/20	80845	81695	33470	90.69	269.5	57398	0
Total 6/25/20	80901	88510	36071	90.77	290.6	62867	0
Total 6/24/20	83374	89327	35618	90.80	287.1	64385	112
Total 6/23/20	84907	93049	37471	90.81	302.1	66584	52
Total 6/22/20	85216	93863	34737	88.51	272.9	61435	6186
Total 6/21/20	84819	89519	3845	80.73	27.6	6201	66552
Total 6/20/20	84670	96199	36502	91.57	296.7	62234	6535
Total 6/19/20	82822	81588	33559	90.73	270.3	57690	0
Total 6/18/20	81617	92076	38109	90.80	307.1	64583	0
Total 6/17/20	80693	80514	32485	90.83	261.9	58254	0
Total 6/16/20	82739	92071	36955	90.82	297.9	66743	0
Total 6/15/20	85381	95371	37235	89.86	297.0	65649	2882
Total 6/14/20	86158	85065	5261	81.72	38.2	8700	60199
Total 6/13/20	85620	89780	36123	90.78	291.1	65481	0

Pri Dig	Raw To CNG	Pipline	%CH4Avg	Gallons (GGE)	Tail Gas	Gas To Flare
raw biogas from primary digester	total gas from digester to BioCNG	CNG to fleet fueling		CNG to fleet fueling	waste gas from skid	totally wasted gas, This to be eliminated