Addendum No. 1
TERMINAL TANK PH IMPROVEMENTS
PWP Bid No.: WA-2017-029
TMWA Capital Project No.: 11-0014
December 5, 2016

The following information, clarifications, changes and modifications are by reference incorporated into the bid documents for the above referenced project. Any work item or contract provision not changed or modified will remain in full force and effect. The bid date and time and construction schedule remain the same.

QUESTION AND RESPONSE

Question No. 1: In looking through the spec book for the above mentioned project, I did not see a Supplementary Conditions section.

Is there a missing section, or no Supplementary Conditions for this project? (Trying to figure out if Builder's Risk is required.)

Response to Question No. 1: Please see attached Section 800 Supplementary Conditions which are to be included on the project.

Question No. 2: Sheet E110 refers you to Detail D on sheet E031. That details shows underground 90 degree elbows to be PVC coated ridged. Do all underground 90degree elbows need to be PVC coated ridged, or can they be ridged 90s wrapped w/10Mil tape?

Response to Question No. 2: All below grade 90 degree elbows need to be PVC- coated ridged.

Question No. 3: Please find the following list of questions pertaining to the HVAC portion of the above referenced project:

1) Please provide specification for UH-1 & UH-2 including required temperature control device.
2) Please provide specification for the required control device for EF-1 & EF-2.

Response to Question No. 3:

UH-1 and UH-2 shall be wall mounted, 18 amp, 5kw. QMARK MUH0571 or equal. Unit heaters are to be provided with internal thermostats from Qmark Electric. EF-1 and EF-2 are to be controlled by two Dayton Line Voltage Mechanical Themostats Manufacturer Number 1UHH2, Heating or Cooling, 24 to 600VAC, 1 stage. All wiring and conduit to be provided by the contractor.

Question No. 4: On drawing M120, details A, B and C show a fill line , vaporizing balancing and pressure relief system. The photo in detail D appears to show existing fill and balancing assemblies. Are

all three of these assemblies provided with the owner furnished tank? If not provided are there specifications for these assemblies.

Response to Question No. 4: The fill line, vaporizing balancing and pressure relief systems as shown on drawing M120 are provided with the owner furnished tank.

Question No. 5: In Specification Section 01025 paragraph 4.6, it says that the install of the CO2 tank is included in this bid item. Paragraph 5.6 Install Existing and Owner Supplied equipment says that the installation of the owner supplied tank is included here. Which is correct?

Response to Question No. 5: In Specification Section 01025 Paragraph 4.6 delete the following: "This item does include the installation of the 18 ton CO2 tank and connection to new CO2 gas feed line." And "… and installation of the 18 to CO2 storage tank."

Question No. 6: Sheet E100 note 3 calls for NVE primary splice boxes to be used in the primary feed conduit run. With many different styles and boxes, which one would NVE like us to use?

Response to Question No. 6: For bidding purposes, provide splice box per NVE RS-3 standard. Final box size and requirements shall be per NVE service design drawings to be provided by NVE.

Question No. 7: I have a question as to who is providing the pump controller (irrigation pump 3hp) as shown on drawing E002. If that is in the electrical scope of work, what functionality and product is required? Part number or diagram?

Response to Question No. 7: Relocate the existing pump controller shown in drawing D101 as "Remove and Salvage" to within the new building.

Question No. 8 On Sht. M110 equipment list, item 6 references a meter pump stand and detail M711. Item 18 references detail M710. The pumps are listed as owner furnished. In the pump specification 11240 2.1B it states the each pump be supplied with PRV, calibration column and be pre-plumbed on existing chemical stand. Please clarify if new stand is required to be supplied by contractor. Also, please clarify which appurtenances are required in detail M710.

Response to Question No. 8: The FRP utility stand shown in detail M711 is to be provided by the contractor. All piping shown in detail M710 should be assumed to be provided by the contractor.

SPECIFICATIONS

Section	Page(s)	Description of amendment
00800	Entire Section	Add the attached specification section 00800 Supplementary Conditions to the contract documents.
01010	1	Please add the following sentence to the end of paragraph 1.1: "Wetted materials that inherently contain lead must have NSF 61- or NSF 372 certification."
01025	4, 6-7	Please remove the two sentences from paragraph section 4.6 as shown in the attached specification. Payment for these items is included in section 5.6. Add Part 8 as shown in the attached specification.
02800	7	Added paragraph 2.13 on page 7 to include fusion epoxy lined pipe specification.

10400	3	Please see attached specification 10400 for revisions to pipe identification color requirements.
11010	16	Change the Unit heater from Wall mounted, 6 Amp, 5kW. QMARK MUH05-41 to Wall mounted, 18 Amp, 5kw, QMARK MUH0571.
15100	4	In paragraph 2.11.A.1.a, please replace "Watts, Number 223" with "Watts, Number LF 223."

DRAWINGS

Sheet Number	Description of amendment
M100	The booster pump suction line diameter was increased from 3 inches to 4 inches. Please see attached drawing for changes.
M110	The booster pump suction line diameter was increased from 3 inches to 4 inches, and the booster pump suction was reconfigured. A 2" check valve was added to the CO2 unit suction line. A portion of the lines material was changed from galvanized steel to fusion epoxy lined and coated steel. Please see attached drawing for changes.
M111	Added a 2" Check valve to the suction side of the CO2 feed panel.
M112	The booster pump suction line diameter was increased from 3 inches to 4 inches, and the booster pump suction was reconfigured. Please see attached drawing for changes.
E001	The power wire size and ground wire size to UH-1 and UH-2 was changed from #12 to #10 wires. See attached drawing E001
E002	The circuit breakers to UH-1 and UH-2 were changed from 20A breakers to 30A breakers. Power supply was changed from 3 phase to single phase. See attached drawing E002

Section 00800

SUPPLEMENTARY CONDITIONS

ARTICLE 1: GENERAL

1.01 General

A. These Supplementary Conditions amend or supplement the General Conditions and other provisions of the Contract Documents as indicated below.

B. All provisions which are not so amended or supplemented remain in full force and effect.

1.02 Project Representative and Engineer

A. The Project Representative is the sole point of contact for the Contractor on matters relating to the Work. References to "Engineer" or "Architect" in the Specifications shall be understood to mean the Project Representative. The Project Representative for this Project is Ryan Owens, Stantec Consulting, 6995 Sierra Center Parkway, Reno, NV 89511, office phone 775-398-1261, cell phone 775-870-2192.

B. The Engineer for this project is Mike Wilkin, P.E., Stantec Consulting, 6995 Sierra Center Parkway, Reno, NV 89511, office phone 775-398-1234, cell phone 775-771-8233.

ARTICLE 2: CONTRACTOR'S INSURANCE

2.01 General

A. The Contractor shall provide insurance as specified in Articles 5.02 and 5.03 of the General Conditions and as modified below.

2.02 Builders Risk

A. Per Article 5.03 A of the General Conditions, Contractor shall provide builders risk insurance for the structures being constructed and renovated under this Contract.

1. Insurance amount shall be for the full cost of replacement at the time of loss.
2. The Builders Risk policy shall cover all physical loss including but not limited to fire, lightning, explosion, wind, hail, aircraft, theft, vandalism, and water damage.

2.03 Engineer and Architect Insurance

B. The Engineer and Architect shall be named as an additional insured on the general liability and automobile liability insurance policies under the provisions of Article 5.02 C. of the General Conditions.

2.04 TMWA Furnished Equipment

Contractor shall provide insurance for TMWA furnished equipment.

1. Contractor shall include in the insurance for work under this Contract, sufficient coverage to protect the TMWA-furnished products against all losses during loading,

unloading, storage, handling, transportation, protection, and installation and until final acceptance of the work by TMWA.

2. In the event that any product is lost, stolen, damaged, or destroyed prior to final acceptance by TMWA, the Contractor shall replace it at no cost to TMWA.
3. For purposes of this insurance coverage, the total estimated value of all TMWA-furnished products is **$250,000.00**

ARTICLE 3: PERMITS

3.01 General

A. Refer to Article 6.06 "Permits" of the General Conditions for requirements governing responsibility for obtaining permits and paying permit fees.

3.02 Construction Site Stormwater Permit

A. Refer to Article 6.14 "Construction Site Stormwater Control" of the General Conditions for additional requirements.

B. The estimated area of land that will be disturbed by the Project is less than one acre therefore the Contractor is not required to prepare a SWPPP or file a NOI with NDEP.

3.03 Dust Control Permit

A. Refer to Article 6.15 "Dust Control" of the General Conditions for additional requirements.

B. The estimated area of land that will be disturbed by the Project is less than one acre therefore TMWA will not obtain a dust control permit from the Washoe county Health District.

3.04 Building Permit

A. The Contractor is responsible for picking up the building permit at the Washoe County Building Department office. TMWA will provide a check for the permit fee.

ARTICLE 4: ACCESS TO WORK SITE

4.01 General

A. Refer to Article 4.01 of the General Conditions for general requirements governing availability of lands.

4.02 Site Specific

A. The terminal tank site is located on property owned by TMWA or is within public easements. The Contractor shall limit his activities to within the boundaries of the easements at all times. The Contractor shall provide notice to TMWA prior to moving equipment or materials onto the site.

ARTICLE 5: DOCUMENTS FOR CONSTRUCTION

5.01 General

A. TMWA will prepare conformed Drawings and Specifications for construction that incorporate all addenda issued during bidding.

B. TMWA will provide 10 sets of the conformed documents to the Contractor for use during construction. Additional sets can be obtained at cost.

C. Only conformed documents shall be used for construction. TMWA will not compensate the Contractor for incorrect work done as a result of not using the conformed Drawings and Specifications.

5.02 Ownership of Documents

A. Per Article 3.06 "Ownership and Return of Contract Documents" of the General Conditions, ownership of the Contract Documents remains with TMWA. All copies shall be returned to the Project Representative before payment will be made for demobilization and before a Notice of Completion will be filed.

ARTICLE 6: PROJECT CLOSEOUT

6.01 General

A. Refer to Article 7.06 "Retention and Final Payment" of the General Conditions for additional information.

B. Project closeout starts when the Contractor submits a letter to the Project Representative stating that the Project is complete and requesting release of retention.

C. The project closeout process is part of the Work and must be completed within the specified Contract Time.

6.02 Procedures

A. Upon receipt of the Contractor's letter, the Project Representative will determine if the Project has been completed as required by the Contract Documents. To be considered complete:

1. The Project shall be in service or be ready to be placed in service.
2. All punch list items shall be completed to the satisfaction of the Project Representative.
3. The final conforming Change Order shall be signed by the Contractor and be ready for execution by TMWA.
4. The retention release pay request shall be submitted and approved by the Project Representative.
5. The Record Drawing set shall be submitted and approved by the Project Representative.
6. All copies of the Contract Documents shall be returned to the Project Representative.
7. All conditions of the Project permits shall be fulfilled. Evidence of acceptance or sign off by each permitting agency shall be submitted to the Project

Representative. The building permit drawing set and completed permit sign off card shall be delivered to the Project Representative.

8. The following items shall be submitted and approved by the Project Representative:
   i. Warranties.
   ii. Test reports and certifications.
   iii. Operation and Maintenance manuals.
   iv. Spare parts.
   v. Special tools.
   vi. If the Contractor utilized other property for staging, equipment storage, stockpiling, or similar uses, a written statement from each property owner stating that all provisions of the agreement between the Contractor and property owner have been complied with.

B. If the Project is complete, the Project Representative will submit the required documentation to TMWA's Contracts Administrator and request that the Notice of Completion be issued. The one year warranty required by Article 6.18 "Warranty" of the General Conditions shall start on the date of the Project Representative's determination that the project is complete.

C. If the Project is not complete, the Project Representative will notify the Contractor in writing of items that need to be completed or submitted before the Project will be considered complete.

ARTICLE 7: PROJECT MILESTONES

7.01 General

A. Refer to Article 3 of the Agreement, the Definitions contained in the General Conditions and Article 2.05 of the General Conditions for additional information.

B. Time is of the essence on this construction Contract and the Work shall be one hundred percent (100%) complete no later than the date specified in the Agreement. As defined in the Agreement, the Time of Completion is based on a specific number of calendar days after the date of the Notice to Proceed (NTP).

C. The date of the NTP begins the Contract Time. Contract Time is defined in the General Conditions. Contractor shall not move onto, store materials, or perform any work at the site prior to the Notice to Proceed. Any mobilization of labor, material or equipment by Contractor prior to TMWA issuing the Notice to Proceed is done at the sole risk and expense of the Contractor, and shall not modify the Contract Time. The allotted Contract Time includes all preliminary Work tasks including permits, surveying, potholing, submittals, etc.

   The tentative project schedule is shown below. The actual project schedule may be slightly different depending upon whether intermediate milestones are met.

Bids Due	**December 7, 2016**
Notice of Award Issued	**December 8, 2016**
Pre-Construction Meeting	**December 22, 2016**
Notice to Proceed	**December 22, 2016**
Start Construction	**December 22, 2016**
Substantial Completion	**One Hundred Sixty-Nine (169) Calendar Days after NTP; on or about June 9, 2017**
Work 100 Percent Complete	**Two Hundred Four (204) Calendar days after NTP; on or about July 14, 2017**

Substantial Completion will be defined as the pH adjustment and monitoring system is completely installed and functioning as intended. The 100 percent completion date requires acceptance of all work by TMWA and cleanup and demobilization from the site by the Contractor.

END OF SUPPLEMENTARY CONDITIONS

SECTION 01010

GENERAL CONSTRUCTION INFORMATION AND REQUIREMENTS

PART 1 GENERAL

1.1 THE REQUIREMENT

The Work to be performed under this Contract shall consist of, but not limited to, furnishing tools, equipment, materials, supplies, and manufactured articles, and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all work or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. All equipment and materials will be in contact with potable water or chemicals for the treatment of potable water shall be NSF 61 certified – this requirement supersedes all other specifications sections that do not explicitly require NSF 61 certification for equipment and materials in contact with potable water chemicals for the treatment of potable water. **Wetted materials that inherently contain lead must have NSF 61- or NSF 372 certification.**

Addendum 1

1.2 WORK COVERED BY CONTRACT DOCUMENTS

The Work to be completed as indicated on the construction drawings will occur at one site owned by the Truckee Meadows Water Authority (TMWA) or within public right-of-way. Below is a general description of the work that will be performed at each site. This is not an all-inclusive list, and the Contractor is responsible for preforming all the work shown in the Plans and Specifications.

A. Terminal Tank Site improvements

1. Equipment Description:

a. Relocation of an existing TMWA owned 18 ton carbon dioxide (CO_2) storage tank from the Longley Lane Water Treatment Facility and installed at the Terminal Tank off Matterhorn Blvd

b. New duplex water booster pump assembly including all electrical and controls

c. New carbonic acid feed system including control/mixing panel and diffuser

d. New HDPE and/or schedule 80 PVC pipe and fittings

e. New stainless steel pipe and fittings

f. New pH monitoring assembly

g. New CO_2 solution and NaOCl injection vault.

h. New irrigation booster pump and backflow preventer

i. New 950 gallon NaOCl storage tank and appurtenances.

j. New peristaltic metering pumps (2)

SECTION 01025

MEASUREMENT & PAYMENT

PART 1 – GENERAL

Payment for the bid items identified in the Bid Schedule, as further described herein, will constitute full compensation to the Contractor for furnishing all labor, equipment, tools, supplies and materials to complete the Work in accordance with the Contract Documents, including the costs of permits and the costs of compliance with the regulations of public agencies having jurisdiction. Any item that is not specifically set forth in the Bid Schedule shall be considered incidental to the cost of the Work. The final pay quantities shall be by field measurement.

The bid items shown in the Bid Schedule shall include as incidental those efforts of similar magnitude and not limited to the following: obtaining permits; removing and replacing fences; removing and replacing landscaping; all rings and hardware required with structures; potholing; clean-up work; dewatering work; resetting disturbed property corners and survey monument replacement; casing adapters, flanged coupling adapters, couplings, pipe reducers, thrust blocks, removal of abandoned equipment, location tape, test fittings, ditches; drainage swales, grading disturbed areas; contract staging areas; miscellaneous code, law, or public health requirements; construction staking or grade setting; dust control; road maintenance and repair; protection of existing improvements; removal of existing surfaces; coordination with public, owner, utilities or other affected agencies; removal of spoils; disposal costs; compliance with standard and manufacturer specifications; conforming to BMP's, overhead and profit; and all other items necessary to provide a complete project, but not specifically mentioned. Damage to existing properties or improvements resulting from the Contractor's operations shall be repaired and restored to a condition as good as or better than that encountered prior to construction activities at the expense of the Contractor.

1.1 MOBILIZATION AND DEMOBILIZATION

The bid price for this item shall include all labor, materials, and equipment required to mobilize and demobilize for the project as specified herein. This item shall also include all utility connections, site preparation and cleanup, permits, and submittals.

The Bid Price for this item shall include all labor, materials, and equipment required to mobilize for the project as specified herein, including, but not limited to, the following:

A. Moving onto each site, including all of the Contractor's plant and equipment.

B. Coordinating access with Truckee Meadows Water Authority.

C. Obtaining all necessary bonds, insurance, and permits.

D. Preparation and submittal of project schedule.

E. Preparation and submittal of all project shop drawings.

F. Demobilization and cleanup of the sites after the project is complete.

No measurement will be made for this item. Payment will be made at the lump sum price as indicated on the Bid Schedule, at the following rates:

A. When 5% of the total original contract amount is earned from other Bid Items, 50% of the amount bid for mobilization, or 5% of the total original contract amount, whichever is the least, will be paid.

B. When 10% of the total original contract amount is earned from other Bid Items, 90% of the amount bid for mobilization, or 10% of the total original contract amount, whichever is the least, will be paid.

C. Upon completion of all work on the Project, including all items on the final punch list generated from the final inspection, payment of all remaining mobilization and demobilization items will be made.

PART 2 TRAFFIC CONTROL

2.1 TRAFFIC CONTROL

The bid price for this item shall include all labor, permits, submittals, materials and equipment required to provide traffic control at all sites during the project execution. The Terminal Tank Site is expected to include traffic control. This item shall include barriers, barricades, resident notification, flagpersons, temporary markings, lights, and all other work needed to provide traffic control in compliance with the latest edition of Orange Book and the MUTCD.

Payment will be made at the lump sum price for the traffic control, complete.

PART 3 SWPP AND BMP'S

3.1 BEST MANAGEMENT PRACTICES

The bid price for this item shall include all labor, equipment and materials required to provide erosion protection on the project, including compliance with all of the requirements of the construction activity for the project. This item shall also include all temporary erosion control measures, sediment barriers, temporary project fencing, slope protection, dust abatement, erosion control requirements, development and maintenance during project construction and site cleanliness.

PART 4 DEMOLITION & SITE WORK

4.1 DEMOLITION

The bid price for this item shall include all labor, equipment and materials required to remove and salvage or waste the existing hypochlorite storage shed, disinfection system, equipment, piping, and site fence. This item shall also include modifications to the existing irrigation system.

Payment will be made at the lump sum price for demolition at the Terminal Tank site.

4.2 SITE GRADING, SURFACING, & REVEGETATION

The bid price for this item shall include all labor, equipment and materials required to perform the site grading and earthwork, including clearing and grubbing, grading the existing site, providing survey elevations, installation of rip rap, removal of any unsuitable materials, import and install base or fill material as necessary, and install aggregate base surfacing.

The bid price for this item shall also include all labor, equipment and materials required to apply an approved native seed mix to areas disturbed by the construction operation and not specifically shown on plans with surfacing as described above.

Payment will be made at the lump sum price for all grading, surfacing, & revegetation site work.

4.3 FURNISH & INSTALL SITE PIPING

The bid price for this item shall include all labor, equipment and materials required to provide installation of all site piping for the Terminal Tank Site. This item includes all piping between and through new and existing vaults, building, and CO2 storage tank; including pipes, drain piping, chemical conduits and tubing, fittings, thrust blocks, excavation, dewatering, shoring, bedding, backfill, testing and disinfection, abandonment and capping of the old lines and appurtenances. This bid item shall include all incidentals necessary to provide a complete functioning project for the Terminal Tank Site.

Payment will be made at the lump sum price for all grading, surfacing, & revegetation site work.

4.4 EXISITNG HYOCHLORITE MONITORING & FEED SYSTEM MODIFICATIONS

The bid price for this item shall include all labor, equipment and materials required to remove & re-install portions of the existing hypochlorite monitoring and feed system. Items to be re-used are specifically called out in the bid documents. The bid price also includes modifications to the existing vaults, cabinets, and shed to properly terminate the old system and transition to the new system. This bid item shall include all incidentals necessary to provide a complete functioning disinfection and chlorine residual monitoring system for the Terminal Tank Site.

Payment will be made at the lump sum price for all modifications to the existing hypochlorite system.

4.5 FURNISH & INSTALL HOT TAPS AND INJECTION VAULT

The bid price for this item shall include all labor, equipment and materials required to provide installation for four taps on 30" ductile iron pipe and install a hybrid pre-cast/poured-in-place reinforced concrete injection vault for the Terminal Tank Site. This item includes all of the necessary appurtenances associated with the vault such as access hatch, collar, access ladder, sump grating, and grouting.

Payment will be made at the lump sum price for the installation of the hot taps and injection vault assemblies.

4.6 CO2 TANK PAD & CO2 TANK INSTALLATION

The bid price for this item shall include all labor, equipment and materials required to provide construction of the reinforced concrete equipment pad for the existing owner supplied 18 ton CO2 storage tank. This item does not include the 18 ton CO2 storage tank of which is owner supplied nor does it

include delivery to the site. This item does include the installation of the 18 ton CO_2 tank and connection to new CO_2 gas feed line.

Payment will be made at the lump sum price for the construction of the reinforced concrete slab and installation of the 18 to CO_2 storage tank.

4.7 SITE FENCING & REMOVABLE BARRIER POSTS

The bid price for this item shall include all labor, equipment and materials required to install new or re-install existing 8' tall vinyl coated chain-link fence with 3-strand barbed wire, including foundations, excavation, concrete, posts, fence materials, and incidentals as necessary for a complete installation. This item shall also include provisions for the installation of new removable barrier posts surrounding CO_2 storage tank.

Payment will be made at the lump sum price for the installation of site fencing and barrier posts.

PART 5 TREATMENT BUILDING & EQUIPMENT

5.1 TREATMENT BUILDING INCLUDING HVAC

This item covers the construction of the masonry block treatment building, including all necessary appurtenances. These items include excavation, foundation, interior fill material, vapor barriers, floor slab, walls, trusses, standing seam metal roofing, roof hatch, doors, HVAC system and any other items necessary to provide the finished building, complete and approved for occupation. This item does not include any piping, electrical work or chemical feed equipment, which are included in other items.

Payment will be made at the lump sum price for the building construction, complete.

5.2 PAINTING

The bid price for this item shall include all labor, equipment and materials required for all painting and coatings at the Terminal Tank site, including coatings within vault(s) and CO_2 storage tank equipment pad. This includes but not limited to block sealer, concrete epoxy corrosion protection, pipe priming and painting, and all finish surface coatings as indicated on the Plans.

Payment will be made at the lump sum price for coatings and painting at the Terminal Tank site, complete.

5.3 MECHANICAL PIPING AND EQUIPMENT

The bid price for this item shall include all labor, equipment, and materials required to install the piping within the building, including all piping not included in the site piping, vaults, and CO_2 Storage Tank. This item shall include but not limited to, carrier water pumps, irrigation pump, gate valves, ball valves, pH monitoring systems, pressure transducers, plumbing items, pipe supports and all other piping related work in the treatment building. This item does not include the acid solution feed panel or diffuser of which is supplied by the owner. This item does not include the hypochlorite feed and storage system or the exterior piping, which are included in other items. This bid item shall include all incidentals necessary to provide a complete functioning pH adjustment and monitoring system for the Terminal Tank Site.

Payment will be made on a lump sum basis for the treatment building mechanical piping and equipment piping and mechanical, installed and tested.

5.4 HYPOCHLORITE STORAGE, PIPING, & EQUIPMENT

The bid price for this item shall include all labor, equipment and materials required to install the hypochlorite feed and storage system at the Terminal Tank Site.

The installation shall include all miscellaneous work associated with the installation, including, chemical piping, open grated metering pump stands, double wall storage tank, assembly of components, interconnection wiring, conduits, initial chemical fills, startup, testing, etc. needed to provide a complete and functional hypochlorite feed and storage system. In addition, this item includes the solution injector and piping from storage to the pumps and from the pump to the injection points. The installation shall include all miscellaneous small diameter piping, floor drains, water main taps, valves, chemical pump, graduated cylinder, injectors, etc. needed to provide a complete and functional chemical feed system for sodium hypochlorite disinfection system. Any control items not included in the electrical items must be included in this item, such as flow switches, level sensors, etc. Also included are an initial fill of all chemicals prior to final acceptance. This item shall also include the onsite services of the supplier's representative for initial startup and training services. This item does not include furnishing the hypochlorite metering pumps of which are owner supplied equipment.

Payment will be made on a lump sum basis for the treatment building hypochlorite feed and storage system, complete.

5.5 EYEWASH AND TEPID WATER HEATER SYSTEM

The bid price for this item shall include all labor, equipment and materials required to install the freeze proof, tepid water eyewash system in the treatment building at the Terminal Tank Site. The installation shall include an exterior wall mounted, self-draining eyewash, tempered water heater with internal heat adjustment, and all incidental piping necessary to provide a safe and reliable eyewash system.

Payment will be made on a lump sum basis for the treatment building freeze-proof and tepid water eye wash system, complete.

5.6 INSTALL EXISTING AND OWNER SUPPLIED EQUIPMENT

The bid price for this item shall include all labor and necessary materials required to install the owner supplied equipment. Owner supplied equipment includes; existing CO_2 storage tank, acid solution feed panel, acid solution diffuser, hypochlorite metering pumps, and chlorine residual analyzer. This bid item is intended to supplement the various systems on this facility to integrate existing or owner supplied equipment with contractor furnished and installed piping and equipment.

Payment will be made on a lump sum basis for the contractor to install owner furnished equipment and test system, complete.

PART 6 FURNISH & INSTALL ELECTRICAL SYSTEMS

6.1 ELECTRICAL

This item includes the provision of all electrical work within and outside the new treatment building at the Terminal Tank site. Items included are the NVE primary underground conduits, riser, primary pullboxes, transformer pad, secondary conduits, power service entrance panel, building electrical wiring, manual transfer switch, shunt trips, connections to the motors, enclosed motor starters, and electrical power upgrade. This item also includes all incidental power connections, including connections to the metering pump, ventilation fans and louvers, and all incidental electrical work not included in the Instrumentation and Control item. This item shall also include all incidental electrical work required to assemble, install, and test all equipment provided in various separate components, such as the hypochlorite chemical feed system. This item does not include the instrumentation and control items, which are included in a separate item below.

No measurement will be made for this item, and the lump sum price bid shall include all conduits, wire, equipment, trenching, backfill and all other items necessary to provide electrical service to the building and equipment.

PART 7 FURNISH & INSTALL CONTROL SYSTEMS

The bid price for this item shall include all labor, equipment and materials required to install all the instrumentation and controls equipment at the Terminal Tank site, cables and equipment, software if required, and all other items needed to provide a control system complete and correctly functioning. The telemetry RTU, radio system, PLC programming, SCADA development, are not included in this item, and will be provided by the Owner separately.

No measurement will be made for this item, and payment will be at the lump sum price as indicated in the Bid Schedule.

PART 8 TRENCHING AND ROCK EXCAVATION

8.1 UNIT COST ADJUSTMENT FOR EXTRA TRENCH DEPTH **Addendum 1**

Payment for this item is contingent and will be based on extra trenching depth, per foot of depth, within the range of 6 to 12 feet below finished grade. The extra trenching depth Bid Item is not applicable to conflicts that could be reasonably anticipated from existing facilities shown on the Drawings or from an inspection of the job site (such as valve covers, manholes, underground location markings, etc.). The cost of trenching 6 feet or less in depth shall be included in the price shown on the Bid Schedule. The unit price for extra trenching depth shall include shoring, bracing, additional backfill, etc. Extra depth is rounded to the nearest foot. Measurement for this item will be per linear foot of trench. See Notes at the end of the Bid Schedule.

8.2 UNIT COST ADJUSTMENT FOR ROCK EXCAVATION

Reference Article 4 of the TMWA general conditions for this contingent item. The measurement for this item will be per linear foot of trench. See Notes at the end of the Bid Schedule.

END OF SECTION

B. Tubing shall be installed in continuous manner from service tap compression nut to water service vault. No joints will be allowed between the service tap and service vault.

C. All connections and compression nuts shall be installed in accordance with manufacturer's specifications.

2.13 Fusion epoxy lined and coated steel (FELCS) pipe

Addendum 1

A. Where specified or shown on the Contract Drawings, steel pipe and fittings shall be fusion epoxy lined and coated. The fusion epoxy coating shall be 3M™ Scotchkote™ Fusion-Bonded Epoxy Coating 206N, Fluid Bed Grade, or approved equal. Surface preparation shall be in accordance with SSPC-SP 10 - Near White Blast Cleaning. The application method shall be by the fluidized bed method and shall attain 16 mils minimum dry film thickness.

B. Field welds, connections and otherwise damaged areas shall be coated and patched, with 3M™ Scotchkote™ 312 or approved equal, according to the manufacturer's instructions.

2.14 RESTRAINED JOINTS

Restrained joint fittings shall be mechanical joint fittings with a mechanical joint restraint gland for use with ductile iron pipe and PVC C900 and C905 pipe. The mechanical joint restraint shall be EBAA Iron, Inc., or approved equal, rated for the project's test pressure.

2.15 FLANGED COUPLING ADAPTERS

Flanged Coupling Adapters shall be manufactured from ductile iron or steel with flange template compatible with adjacent fitting or valve. Minimum working pressure rating shall be not less than the adjacent valve, fitting or piping. Couplings shall be factory furnished with fusion bonded epoxy coating per AWWA C213. FCA shall be manufactured by Romac, Dresser or approved equal.

2.16 RESTRAINED FLANGE ADAPTERS

Restrained flange adapters, where called for on the Plans, shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10 (125#/Class 150 Bolt Pattern). Restraint for flange adapter shall consist of a series of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.

The flange adapters shall be capable of deflection during assembly or permit lengths of pipe to be field cut to allow a minimum 0.6 inch gap between the end of the pipe and the mating flange without affecting the integrity of the seal.

All internal surfaces of the gasket ring (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. Sealing gaskets shall be constructed of EPDM. The coating shall meet ANSI/NSF-61 and NSF 372. Exterior surfaces of the gasket ring shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.

Pressure ratings shall be a minimum of 250 psi, or as shown on the Plans. The flange adapter shall be the Series 2100 MEGAFLANGE® Restrained Flange Adapter as produced by EBAA Iron, Inc., Uni-flange Series 400, or approved equal.

High pressure flange adapters, where called for on the Plans, shall be rated for 350 psi service minimum and provided with ANSI/AWWA Class 250 flange drilling, High pressure flange

No. of Signs Required	Text Wording	Placement
1	"FIRE EXTINGUISHER"	One Per Building
2	"EYE PROTECTION"	Water Treatment Bldg.
1	"HEARING PROTECTION"	Water Treatment Bldg.

2.6 BUILDING IDENTIFICATION

A. Not required.

2.7 IDENTIFICATION OF PIPING AND VALVES

A. Piping:

1. Plastic markers for coding pipe shall conform to ANSI A13.1 and shall be as manufactured by W.H. Brady Company, Seton Name Plate Corporation, or equal. Markers shall be the mechanically attached type that are easily removable; they shall not be the adhesive applied type. Markers shall consist of pressure sensitive legends applied to plastic backing which is strapped or otherwise mechanically attached to the pipe.
2. Plastic zip ties shall not be allowed for fastening.
3. Legend and backing shall be resistant to petroleum based oils and grease and shall meet criteria for humidity, solar radiation, rain, salt, fog and leakage fungus, as specified by MIL-STD-810C. Markers shall withstand a continuous operating temperature range of -40°F to +180°F, for aeration piping provide temperature rating up to 300°F. Plastic coding markers shall not be the individual letter type but shall be manufactured and applied in one continuous length of plastic.

   Markers shall be provided in the following letter heights:

Outside Pipe Diameter (inches*)	Letter Height (inches)
Less than 1.5	1/2
1.5 through 6	1/2 - 1
Greater than 6	1 - 2

* Outside pipe diameter shall include insulation and jacketing.

4. In addition, pipe markers shall include uni- and bi-directional arrows in the same sizes as the legend.

Addendum 1

5. Colors of identification and letters shall comply with the legend below and with ANSI A13.1. ~~**See Section 15010 for color code usage.**~~

Pipe Identification Color	Background Color	Color of Lettering/Arrows
Chemical Feed	Yellow	Black
Sanitary or Storm Sewer	Green	White
Potable Water	Blue	White

percent of the synchronous displacement amplitude component without manufacturer's detailed verification of the origin and ultimate effect of said excitation.

Any equipment showing excessive vibration shall be corrected by the Contractor at his expense and the equipment retested.

D. The Contractor shall furnish a written report covering all the test values and data for each unit tested.

2.28 UNIT HEATERS

Electrical unit heaters shall be Wall mounted, ~~6 Amp~~ 18 amp, 5kW. QMARK ~~MUH05-41~~ MUH0571 or equal.

Addendum 1

PART 3 EXECUTION

3.1 EQUIPMENT INSTALLATION

A. Belt Driven Equipment: Mount with motors on common steel base with adjustable motor mount.

B. Pumps: Align pump and motor. Completely fill steel and cast iron pump bases with concrete grout after properly set.

C. Install equipment so nameplates are visible.

D. Basis for equipment and material installation is the published recommendations of manufacturer. Submit such recommendations for review.

E. Pipelines and other connections to mechanical equipment shall be installed square and shall not put in strain or use the equipment for support unless it is specifically designed for it.

3.2 IDENTIFICATION

A. Provide manufacturers' nameplates on all equipment, identifying manufacturer's name, model number, size, capacity, and electrical characteristics.

B. Leave all manufacturers' nameplates clean and legible. Install all equipment so view of nameplates is not obstructed.

C. Identify all equipment with symbol number and service as shown. Identification shall be on 1-1/4 inch by 3 inch, or larger nameplates, securely fastened to equipment. See section 2.4 Nameplates.

D. Provide engraved identification of function on switches and manually operable controls.

3.3 CLEANING

A. During progress of work, keep premises reasonably free of debris, cuttings, and waste material. Upon completion of work, and at other times as directed, remove all such debris from premises.

B. Clean equipment and materials. Remove foreign materials including dirt, grease, splashed paint, and plaster. Restore to original condition any finish damaged.

design pressure. CAVs on 12-inch and smaller mains shall be 1 inch unless shown otherwise on the plans. Valves shall be APCO Model 143C combination air valve, or approved equal.

2.9 GLOBE VALVES

A. Design: Valve rated for 200 psi at 150 degrees F. Manual opening valve shall have a handwheel with outside screw and yoke assembly.

B. Materials: Body and bonnet shall be constructed of cast iron, conforming to ASTM A 126 class B. Disc shall be bronze faced.

C. Manufacturers: Crane, or equal.

2.10 NEEDLE VALVES (NV)

A. ¾ -inch and Smaller: Crane No. 88 or 89; Stockham B64, or equal.

2.11 WATER PRESSURE REGULATING VALVES

A. Water Pressure Regulating Valves, less than 4-inches:

1. Manufacturers:

Addendum 1

a. Valves 2 inches and smaller: **Watts, Number LF 223**; Masoneilan Number 227; Cla-Val Model 90-01 or equal.

b. Valves 2 inches to 3 -1/2 Inches: Watts/Bailey, Number 30A; Fisher Controls Company, Type 616; Masoneilan Number 525 Cla-Val Model 90-01; or equal.

2. Water Pressure Reducing Valves less than 4 inch size: Direct acting, spring loaded valves except where otherwise specified in the Specifications.

3. Materials:

a. Valves 2-inches or smaller: Bronze body , nylon reinforced diaphragm single seat, composition disc.

b. Valves 2-inches to 3-1/2 inches: Double port with stainless steel V-ported or contoured plug, reinforced neoprene diaphragm, and stainless steel stem.

2.12 TUBING VALVES

A. Manufacturers: One of the following or equal:

1. Stockham, Figure S-127
2. Jenkins, 1336
3. Crane, 950 TF

B. Valves: 1 piece bar stock ball valve.

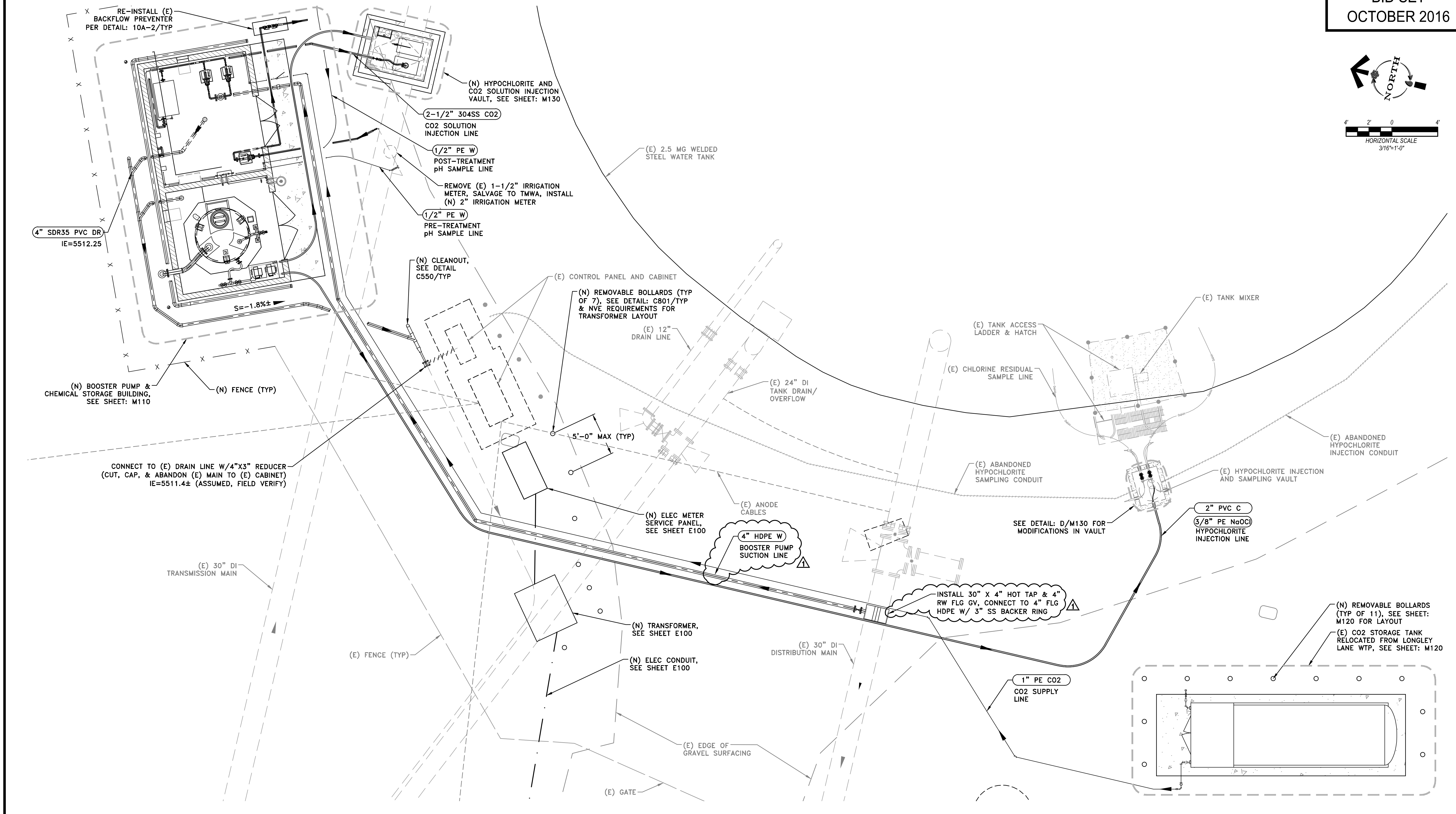
1. Materials:

a. Body: Type 316 Stainless Steel

b. Bull: Type 316 Stainless Steel

c. Insert: Type 316 Stainless Steel

BID SET
OCTOBER 2016


RE-INSTALL (E) BACKFLOW PREVENTER PER DETAIL: 10A-2/TYP
(N) HYPOCHLORITE AND CO2 SOLUTION INJECTION VAULT, SEE SHEET: M130
2-1/2" 304SS CO2
CO2 SOLUTION INJECTION LINE
1/2" PE W
POST-TREATMENT pH SAMPLE LINE
REMOVE (E) 1-1/2" IRRIGATION METER, SALVAGE TO TMWA, INSTALL (N) 2" IRRIGATION METER
1/2" PE W
PRE-TREATMENT pH SAMPLE LINE
4" SDR35 PVC DR
IE=5512.25
S=-1.8%±
(N) BOOSTER PUMP & CHEMICAL STORAGE BUILDING, SEE SHEET: M110
(N) FENCE (TYP)
(N) CLEANOUT, SEE DETAIL C550/TYP
(E) CONTROL PANEL AND CABINET
(N) REMOVABLE BOLLARDS (TYP OF 7), SEE DETAIL: C801/TYP & NVE REQUIREMENTS FOR TRANSFORMER LAYOUT
(E) 12" DRAIN LINE
(E) 24" DI TANK DRAIN/ OVERFLOW
5'-0" MAX (TYP)
CONNECT TO (E) DRAIN LINE W/4"X3" REDUCER (CUT, CAP, & ABANDON (E) MAIN TO (E) CABINET) IE=5511.4± (ASSUMED, FIELD VERIFY)
(N) ELEC METER SERVICE PANEL, SEE SHEET E100
(E) ANODE CABLES
4" HDPE W
BOOSTER PUMP SUCTION LINE
(E) 30" DI TRANSMISSION MAIN
INSTALL 30" X 4" HOT TAP & 4" RW FLG GV, CONNECT TO 4" FLG HDPE W/ 3" SS BACKER RING
(N) TRANSFORMER, SEE SHEET E100
(E) FENCE (TYP)
(E) 30" DI DISTRIBUTION MAIN
(N) ELEC CONDUIT, SEE SHEET E100
(E) EDGE OF GRAVEL SURFACING
(E) GATE
(E) 2.5 MG WELDED STEEL WATER TANK
(E) TANK MIXER
(E) TANK ACCESS LADDER & HATCH
(E) CHLORINE RESIDUAL SAMPLE LINE
(E) ABANDONED HYPOCHLORITE INJECTION CONDUIT
(E) ABANDONED HYPOCHLORITE SAMPLING CONDUIT
(E) HYPOCHLORITE INJECTION AND SAMPLING VAULT
SEE DETAIL: D/M130 FOR MODIFICATIONS IN VAULT
2" PVC C
3/8" PE NaOCl
HYPOCHLORITE INJECTION LINE
(N) REMOVABLE BOLLARDS (TYP OF 11), SEE SHEET: M120 FOR LAYOUT
(E) CO2 STORAGE TANK RELOCATED FROM LONGLEY LANE WTP, SEE SHEET: M120
1" PE CO2
CO2 SUPPLY LINE
NORTH
4' 2' 0 4'
HORIZONTAL SCALE
3/16"=1'-0"

REVISION	DESCRIPTION	BY	APP	DATE
1	ADDENDUM #1	EHP	MSW	12/1/16

WORK ORDER NO. PO-002109
DESIGNED JPB
DRAWN AAA
DATE OCTOBER 2016
CHECKED MSW
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
1355 CAPITAL BLVD. / PO BOX 30013
RENO, NEVADA 89520-3013
PH 775-834-8080 / FX 775-834-8003

TERMINAL TANK pH ADJUSTMENT SYSTEM

TERMINAL TANK MECHANICAL SITE PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
MICHAEL S. WILKIN
EXP: 6/30/18
CIVIL
No.17270
10/07/2016

SHEET NUMBER
M100
19 OF 46

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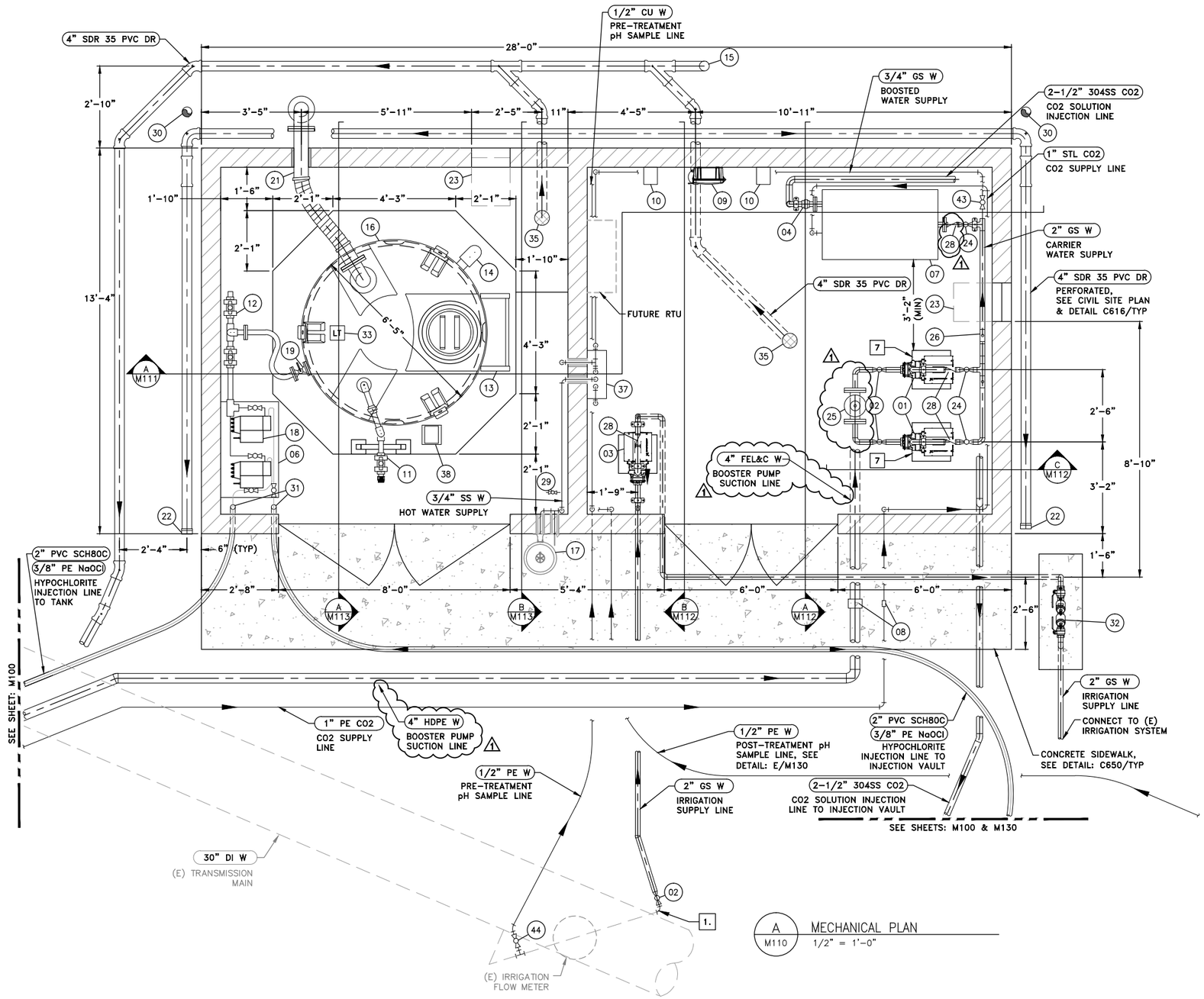
BID SET
OCTOBER 2016



A M110 MECHANICAL PLAN
1/2" = 1'-0"

NORTH

TREATMENT BUILDING MECHANICAL EQUIPMENT

TAG	DESCRIPTION	DETAIL
01	85 GPM @ 130' TDH, 7.5 HP END SUCTION BOOSTER PUMP	
02	2" NPT BV	
03	50 GPM @ 104' TDH 3 HP IRRIGATION PUMP	
04	NPT GS OR STL UNION (SIZE ACCORDINGLY)	
05	1/2" NPT BV	
06	OPEN GRATED METERING PUMP STAND	M711/TYP
07	CO2 FEED PANEL (TOMCO2 UNIT PROVIDED BY TMWA)	
08	HDPE/GS OR STL TRANSITION COUPLING	
09	CHLORINE RESIDUAL ANALYZER SYSTEM	M922/TYP
10	pH MONITORING SYSTEM	M920/TYP
11	CHEMICAL FILL ASSEMBLY	M721/TYP
12	CHEMICAL TANK OUTLET/DRAIN ASSEMBLY	M720/TYP
13	TANK ACCESS LADDER PER MFG RECOMMENDATION	
14	4" SCH 40 PVC TANK OVERFLOW W/ PIPE SUPPORTS	
15	4" CLEANOUT	C550/TYP
16	950 GAL DOUBLE WALL BULK STORAGE TANK (MAX)	
17	PERMANENT FREEZE PROOF EYEWASH STATION	
18	HYPOCHLORITE METERING PUMPS (TYP OF 2)	M710/TYP
19	2" FLG PVC BV	M730/TYP
20	EQUIPMENT DRAIN	M330/TYP
21	6" CHEM TANK VENT ASSEMBLY	M722/TYP
22	4" SLOTTED PVC END CAP LINED W/ SS MESH	
23	1/20 HP EXHAUST FAN (407 CFM) @ 8'-0" AFF	M950/TYP
24	2" TRUE UNION BV	
25	4" FLG TEE 4" X 1" COMAPION FLG & 1" NPT NIPPLE & BV	
26	2" X 1" NPT TEE W/1" BV & PRESSURE TRANSDUCER	M102/TYP
27	2 1/2" X 2" NPT REDUCER	
28	2" NPT CHECK VALVE	
29	3/4" HOSE BIB	M625/TYP
30	4" SDR 35 PVC DOWNSPOUT GUTTER CONNECTION ASSEMBLY	D/M112
31	FLOOR PENETRATION FOR CHEMICAL CONDUIT	M340/TYP
32	2" BACKFLOW PREVENTER	10A-2/TYP
33	ULTRASONIC LEVEL TRANSDUCER	
34	3/4" NPT WYE STRAINER	
35	FLOOR DRAIN	M330/TYP
36	3/4" NPT PRESSURE RELIEF VALVE	
37	18 KW TANKLESS WATER HEATER (MAINTAIN 5' CLEAR IN FRONT OF PANEL)	
38	TANK LEVEL INDICATOR	M921/TYP
39	2" NPT TEE W/2" X 1" BUSHING & 1" NPT NIPPLE & BV	
41	1" NPT BV	
42	2" SCH 40 PVC DRAIN SLEEVE	
43	3/4" NPT BV	
44	1/2" NPT SERVICE SADDLE	M104/TYP

NOTES:

1. CUT, CAP, & ABANDON (E) IRRIGATION MAIN DOWNSTREAM OF IRRIGATION METER. INSTALL 2" GS 90° ELBOW W/ 2" NPT BV. ADJUST MATERIALS & SIZES TO ACCOMODATE (E) PIPING AS NEEDED
2. ALL PRESSURIZED MAINS, PIPES, AND TUBING SHALL HAVE A MINIMUM BURY DEPTH OF 36" TO TOP OF PIPE.
3. ALL WALL PENETRATIONS UNLESS NOTED OTHERWISE SHALL BE CORE DRILLED AND INSTALLED PER DETAIL: M302/TYP.
4. UNLESS NOTED OTHERWISE, ALL PIPING SHALL BE SECURED TO STRUCTURE(S) PER MECHANICAL DETAILS: M410/TYP, M440/TYP & M448/TYP.
5. ALL FLOOR PENETRATIONS UNLESS OTHERWISE NOTED SHALL BE CONSTRUCTED PER DETAIL: M303/TYP.
6. THE ARRANGEMENT OF PIPING ALONG WALLS IS SHOWN FOR CLARITY. PIPING SHALL BE INSTALLED FOR EASE OF MAINTENANCE, SAFETY, CLEANLINESS, AND EFFICIENCY.
7. REINFORCED CONCRETE PUMP PEDESTAL PER DETAIL: M690/TYP.
8. ABOVE GRADE PIPING ELEVATIONS ARE APPROXIMATE. CONTRACTOR TO COORDINATE W/MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR SPECIFIC ELEVATIONS.

REVISION	DESCRIPTION	BY	APP	DATE
1	ADDENDUM #1	EHP	MSW	12/1/16

WORK ORDER NO. PO-002109
DESIGNED JPB
DRAWN AAA
DATE OCTOBER 2016
CHECKED MSW
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
1355 CAPITAL BLVD. / PO BOX 30013
RENO, NEVADA 89520-3013
PH 775-834-8080 / FX 775-834-8003

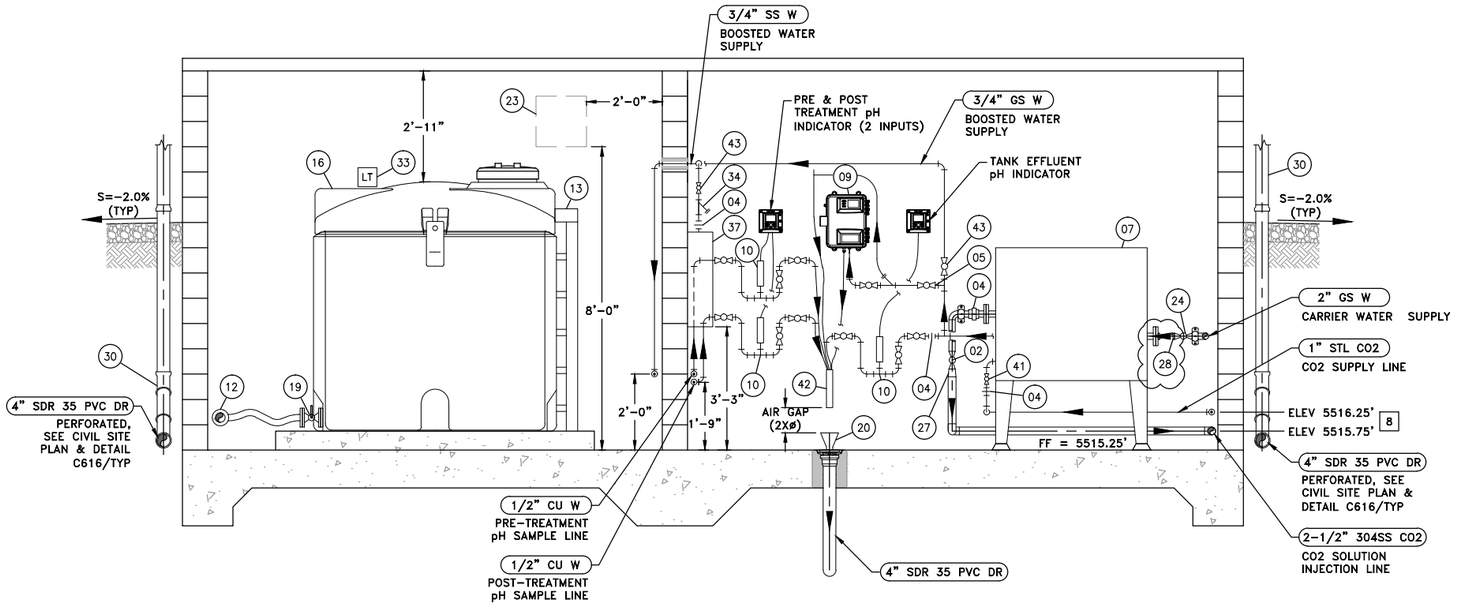
TERMINAL TANK pH ADJUSTMENT SYSTEM

BOOSTER PUMP & CHEMICAL STORAGE BUILDING MECHANICAL PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
MICHAEL S. MILKIN
EXP: 6/30/18
CIVIL
No.17270
10/07/2016

SHEET NUMBER
M110
20 OF 46

BID SET
OCTOBER 2016



A M111 MECHANICAL SECTION/ELEVATION
1/2" = 1'-0"

TREATMENT BUILDING MECHANICAL EQUIPMENT

TAG	DESCRIPTION	DETAIL
01	85 GPM @ 130' TDH, 7.5 HP END SUCTION BOOSTER PUMP	
02	2" NPT BV	
03	50 GPM @ 104' TDH 3 HP IRRIGATION PUMP	
04	NPT GS OR STL UNION (SIZE ACCORDINGLY)	
05	1/2" NPT BV	
06	OPEN GRATED METERING PUMP STAND	M711/TYP
07	CO2 FEED PANEL (TOMCO2 UNIT PROVIDED BY TMWA)	
08	HDPE/GS OR STL TRANSITION COUPLING	
09	CHLORINE RESIDUAL ANALYZER SYSTEM	M922/TYP
10	pH MONITORING SYSTEM	M920/TYP
11	CHEMICAL FILL ASSEMBLY	M721/TYP
12	CHEMICAL TANK OUTLET/DRAIN ASSEMBLY	M720/TYP
13	TANK ACCESS LADDER PER MFG RECOMMENDATION	
14	4" SCH 40 PVC TANK OVERFLOW W/ PIPE SUPPORTS	
15	4" CLEANOUT	C550/TYP
16	950 GAL DOUBLE WALL BULK STORAGE TANK (MAX)	
17	PERMANENT FREEZE PROOF EYEWASH STATION	
18	HYPOCHLORITE METERING PUMPS (TYP OF 2)	M710/TYP
19	2" FLG PVC BV	M730/TYP
20	EQUIPMENT DRAIN	M330/TYP
21	6" CHEM TANK VENT ASSEMBLY	M722/TYP
22	4" SLOTTED PVC END CAP LINED W/ SS MESH	
23	1/20 HP EXHAUST FAN (407 CFM) @ 8'-0" AFF	M950/TYP
24	2" TRUE UNION BV	
25	4" FLG TEE 4" X 1" COMAPION FLG & 1" NPT NIPPLE & BV	
26	2" X 1" NPT TEE W/1" BV & PRESSURE TRANSDUCER	M102/TYP
27	2 1/2" X 2" NPT REDUCER	
28	2" NPT CHECK VALVE	
29	3/4" HOSE BIB	M625/TYP
30	4" SDR 35 PVC DOWNSPOUT GUTTER CONNECTION ASSEMBLY	D/M112
31	FLOOR PENETRATION FOR CHEMICAL CONDUIT	M340/TYP
32	2" BACKFLOW PREVENTER	10A-2/TYP
33	ULTRASONIC LEVEL TRANSDUCER	
34	3/4" NPT WYE STRAINER	
35	FLOOR DRAIN	M330/TYP
36	3/4" NPT PRESSURE RELIEF VALVE	
37	18 KW TANKLESS WATER HEATER (MAINTAIN 5' CLEAR IN FRONT OF PANEL)	
38	TANK LEVEL INDICATOR	M921/TYP
39	2" NPT TEE W/2" X 1" BUSHING & 1" NPT NIPPLE & BV	
41	1" NPT BV	
42	2" SCH 40 PVC DRAIN SLEEVE	
43	3/4" NPT BV	
44	1/2" NPT SERVICE SADDLE	M104/TYP

NOTES:

1. CUT, CAP, & ABANDON (E) IRRIGATION MAIN DOWNSTREAM OF IRRIGATION METER. INSTALL 2" GS 90° ELBOW W/ 2" NPT BV. ADJUST MATERIALS & SIZES TO ACCOMODATE (E) PIPING AS NEEDED
2. ALL PRESSURIZED MAINS, PIPES, AND TUBING SHALL HAVE A MINIMUM BURY DEPTH OF 36" TO TOP OF PIPE.
3. ALL WALL PENETRATIONS UNLESS NOTED OTHERWISE SHALL BE CORE DRILLED AND INSTALLED PER DETAIL: M302/TYP.
4. UNLESS NOTED OTHERWISE, ALL PIPING SHALL BE SECURED TO STRUCTURE(S) PER MECHANICAL DETAILS: M410/TYP, M440/TYP & M448/TYP.
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7. REINFORCED CONCRETE PUMP PEDESTAL PER DETAIL: M690/TYP.
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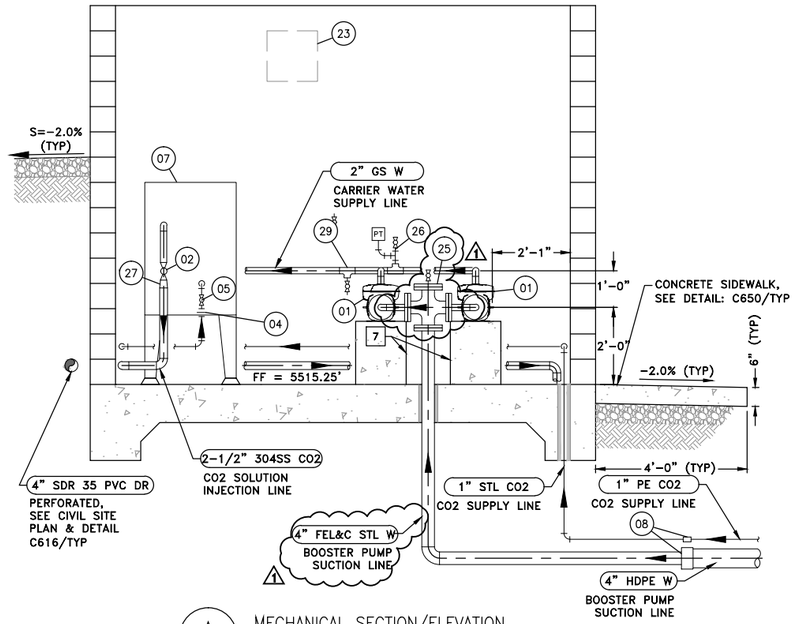
TERMINAL TANK pH ADJUSTMENT SYSTEM

BOOSTER PUMP & CHEMICAL STORAGE BUILDING MECHANICAL SECTION/ELEVATIONS

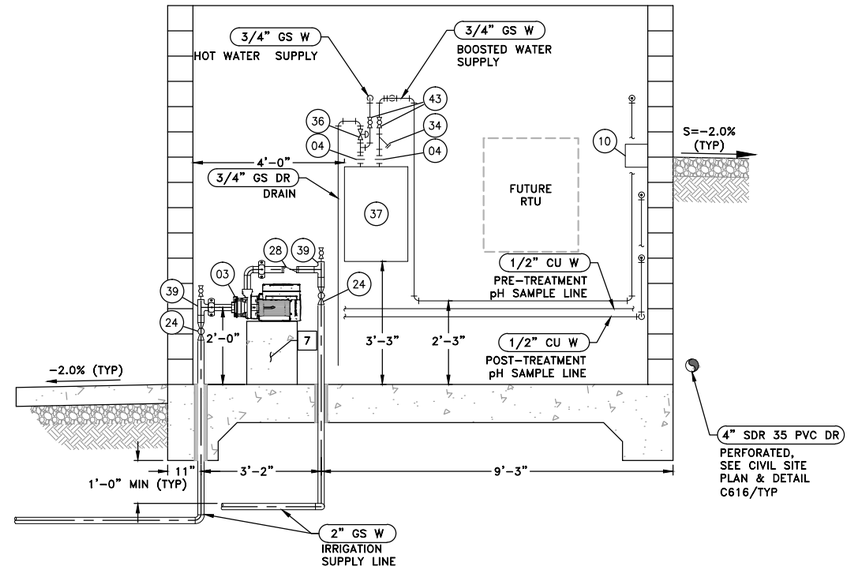
PROFESSIONAL ENGINEER - STATE OF NEVADA
MICHAEL S. WILKIN
EXP: 6/30/18
CIVIL
No.17270
10/07/2016

SHEET NUMBER
M111
21 OF 46

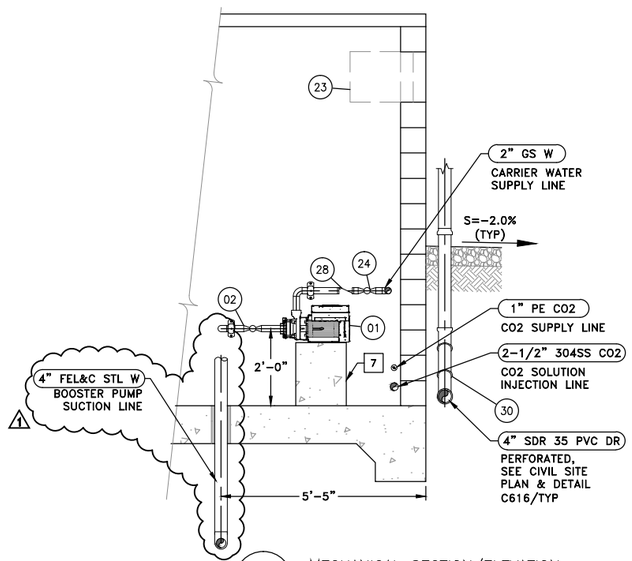
BID SET
OCTOBER 2016



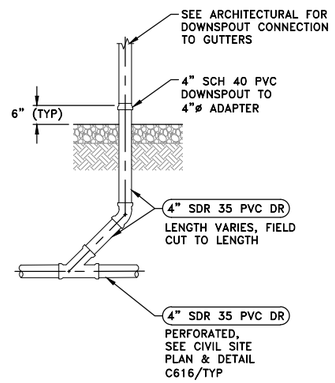
A M112 MECHANICAL SECTION/ELEVATION
1/2" = 1'-0"



B M112 MECHANICAL SECTION/ELEVATION
1/2" = 1'-0"



C M112 MECHANICAL SECTION/ELEVATION
1/2" = 1'-0"



D M112 MECHANICAL SECTION/ELEVATION
1/2" = 1'-0"

TREATMENT BUILDING MECHANICAL EQUIPMENT

TAG	DESCRIPTION	DETAIL
01	85 GPM @ 130' TDH, 7.5 HP END SUCTION BOOSTER PUMP	
02	2" NPT BV	
03	50 GPM @ 104' TDH 3 HP IRRIGATION PUMP	
04	NPT GS OR STL UNION (SIZE ACCORDINGLY)	
05	1/2" NPT BV	
06	OPEN GRATED METERING PUMP STAND	M711/TYP
07	CO2 FEED PANEL (TOMCO2 UNIT PROVIDED BY TMWA)	
08	HDPE/GS OR STL TRANSITION COUPLING	
09	CHLORINE RESIDUAL ANALYZER SYSTEM	M922/TYP
10	pH MONITORING SYSTEM	M920/TYP
11	CHEMICAL FILL ASSEMBLY	M721/TYP
12	CHEMICAL TANK OUTLET/DRAIN ASSEMBLY	M720/TYP
13	TANK ACCESS LADDER PER MFG RECOMMENDATION	
14	4" SCH 40 PVC TANK OVERFLOW W/ PIPE SUPPORTS	
15	4" CLEANOUT	C550/TYP
16	950 GAL DOUBLE WALL BULK STORAGE TANK (MAX)	
17	PERMANENT FREEZE PROOF EYEWASH STATION	
18	HYPOCHLORITE METERING PUMPS (TYP OF 2)	M710/TYP
19	2" FLG PVC BV	M730/TYP
20	EQUIPMENT DRAIN	M330/TYP
21	6" CHEM TANK VENT ASSEMBLY	M722/TYP
22	4" SLOTTED PVC END CAP LINED W/ SS MESH	
23	1/20 HP EXHAUST FAN (407 CFM) @ 8'-0" AFF	M950/TYP
24	2" TRUE UNION BV	
25	4" FLG TEE 4" X 1" COMAPION FLG & 1" NPT NIPPLE & BV	
26	2" X 1" NPT TEE W/1" BV & PRESSURE TRANSDUCER	M102/TYP
27	2 1/2" X 2" NPT REDUCER	
28	2" NPT CHECK VALVE	
29	3/4" HOSE BIB	M625/TYP
30	4" SDR 35 PVC DOWNSPOUT GUTTER CONNECTION ASSEMBLY	D/M112
31	FLOOR PENETRATION FOR CHEMICAL CONDUIT	M340/TYP
32	2" BACKFLOW PREVENTER	10A-2/TYP
33	ULTRASONIC LEVEL TRANSDUCER	
34	3/4" NPT WYE STRAINER	
35	FLOOR DRAIN	M330/TYP
36	3/4" NPT PRESSURE RELIEF VALVE	
37	18 KW TANKLESS WATER HEATER (MAINTAIN 5' CLEAR IN FRONT OF PANEL)	
38	TANK LEVEL INDICATOR	M921/TYP
39	2" NPT TEE W/2" X 1" BUSHING & 1" NPT NIPPLE & BV	
41	1" NPT BV	
42	2" SCH 40 PVC DRAIN SLEEVE	
43	3/4" NPT BV	
44	1/2" NPT SERVICE SADDLE	M104/TYP

NOTES:

1. CUT, CAP, & ABANDON (E) IRRIGATION MAIN DOWNSTREAM OF IRRIGATION METER. INSTALL 2" GS 90° ELBOW W/ 2" NPT BV. ADJUST MATERIALS & SIZES TO ACCOMODATE (E) PIPING AS NEEDED
2. ALL PRESSURIZED MAINS, PIPES, AND TUBING SHALL HAVE A MINIMUM BURY DEPTH OF 36" TO TOP OF PIPE.
3. ALL WALL PENETRATIONS UNLESS NOTED OTHERWISE SHALL BE CORE DRILLED AND INSTALLED PER DETAIL: M302/TYP.
4. UNLESS NOTED OTHERWISE, ALL PIPING SHALL BE SECURED TO STRUCTURE(S) PER MECHANICAL DETAILS: M410/TYP, M440/TYP & M448/TYP.
5. ALL FLOOR PENETRATIONS UNLESS OTHERWISE NOTED SHALL BE CONSTRUCTED PER DETAIL: M303/TYP.
6. THE ARRANGEMENT OF PIPING ALONG WALLS IS SHOWN FOR CLARITY. PIPING SHALL BE INSTALLED FOR EASE OF MAINTENANCE, SAFETY, CLEANLINESS, AND EFFICIENCY.
7. REINFORCED CONCRETE PUMP PEDESTAL PER DETAIL: M690/TYP.
8. ABOVE GRADE PIPING ELEVATIONS ARE APPROXIMATE. CONTRACTOR TO COORDINATE W/MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR SPECIFIC ELEVATIONS.

REVISION	DESCRIPTION	BY	APP	DATE
1	ADDENDUM #1	EHP	MSW	12/1/16

WORK ORDER NO. PO-002109
DESIGNED JPB
DRAWN AAA
DATE OCTOBER 2016
CHECKED MSW
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
1355 CAPITAL BLVD. / PO BOX 30013
RENO, NEVADA 89520-3013
PH 775-834-8080 / FX 775-834-8003

TERMINAL TANK pH ADJUSTMENT SYSTEM

BOOSTER PUMP ROOM MECHANICAL SECTION/ELEVATIONS

PROFESSIONAL ENGINEER - STATE OF NEVADA
MICHAEL S. MILKIN
EXP: 6/30/18
CIVIL
No. 17270
10/07/2016

SHEET NUMBER
M112
22 OF 46

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12/22/2016 1:12 PM By: Owens, Bryan
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ELECTRICAL SYMBOLS

CLG.	WALL	FLOOR	SYMBOLS DESCRIPTION
			EMERGENCY LIGHT
			CEILING MOUNTED LIGHT FIXTURE
			WALL MOUNTED LIGHT FIXTURE
			EXIT SIGN
			FIXTURE TYPE "A", 2–40 WATT LAMPS TYPICAL FOR ROOM NOTED, UON
	$		SINGLE POLE SWITCH **
	*		+ 18" UON
	**		+ 48" UON
			DETAIL CALL–OUT: X, DETAIL IDENTIFIER; Y, SHEET WHERE DETAIL IS DRAWN
			GROUND ROD, 3/4" x 10'–0" GW NEXT TO SYMBOL INDICATES GROUND ROD IN HANDHOLE
			EQUIPMENT TAG
			CONDUIT CONCEALED IN WALLS OR CEILING 3/4"C–2#12, 1#12G, UON
			CONDUIT UNDER GROUND 3/4"C–2#12, 1#12G, UON
			CONDUIT EXPOSED 3/4"C–2#12, 1#12G, UON
			QUANTITY OF WIRES,CURVE LINE INDICATES GROUND WIRE
			CONNECTION TO GROUND BUS.
			GROUNDING CONDUCTOR 30" BELOW GRADE, #4/0 UON
			EXOTHERMIC WELD CONNECTION
			HOMERUN TO PANEL A, CIRCUIT 1 AND 3
			CONDUIT BENDS TOWARD OBSERVER
			CONDUIT BENDS AWAY FROM OBSERVER
			CONDUIT STUB–OUT AND CAPPED
			FLEXIBLE CONDUIT CONNECTION
			POWER DISTRIBUTION SWITCHBOARD
			SURFACE MOUNTED PANELBOARD
			FLUSH MOUNTED PANELBOARD
			SHEET NOTE, SEE NOTE INDICATED
			UTILITY METERING
			POWER TRANSFORMER
			CIRCUIT BREAKER, 3 POLE UNLESS NOTED MCP INDICATES MOTOR CIRCUIT PROTECTOR
			DISCONNECT SWITCH, NON–FUSIBLE SEE PLANS FOR RATING
			MOTOR, 10 HORSEPOWER
			POWER MONITOR
			GROUND
			INCOMING ELECTRIC SERVICE
			SHUNT TRIP
			PULL BOX, 11"X17" UON

ELECTRICAL SYMBOLS - SCHEMATIC DIAGRAMS

NORMALLY OPEN	NORMALLY CLOSED	DEVICE
		CONTACT
		TIMED CONTACT CONTACT ACTION RETARDED ON ENERGIZATION
		PUSH BUTTON SINGLE CIRCUIT MOMENTARY CONTACT
		PUSH BUTTON SINGLE CIRCUIT LOCK–OUT
		LIQUID LEVEL SWITCH
		TEMPERATURE SWITCH
	D/I	DOOR INTERLOCK SWITCH
	A	PILOT LIGHT R=RED, W=WHITE, G=GREEN, A=AMBER, C=CLEAR
	R	PILOT LIGHT–PUSH TO TEST
	R	RELAY
	TD	TIME DELAY RELAY
	M	STARTER COIL
	S	SOLENOID OPERATED VALVE
		MOTOR
	ETM	ELAPSED TIME METER
		FUSE
		CONTROL POWER TRANSFORMER
		GROUND
		WIRING IN MOTOR STARTER OR CONTROL PANEL
		FIELD WIRING
		TERMINAL BLOCK IN MOTOR STARTER OR PANEL
		TERMINAL BLOCK IN PLC
	PFR	POWER FAILURE
		CIRCUIT BREAKER
	PR	PLC OUTPUT ISOLATION RELAY

POWER WIRE COLOR CODE

SYSTEM	PHASE A	PHASE B	PHASE C	NEUTRAL	GROUND
208Y/120V	BLACK	RED	BLUE	WHITE	GREEN
480Y/277V	BROWN	ORANGE	YELLOW	GRAY	GREEN

ELECTRICAL ABBREVIATIONS

A	AMPERES	MTS	MANUAL TRANSFER SWITCH
AC	ALTERNATING CURRENT	N	NEUTRAL
AFF	ABOVE FINISHED FLOOR	NC	NORMALLY CLOSED
AFG	ABOVE FINISHED GRADE	NIC	NOT IN CONTRACT
AIP	ABANDON IN PLACE	NO	NORMALLY OPEN
ATS	AUTOMATIC TRANSFER SWITCH	NO.	NUMBER
BKBD	BACKBOARD	NTS	NOT TO SCALE
C	CONDUIT, CONDUCTOR	NVE	NEVADA ENERGY
CB	CIRCUIT BREAKER	P	POLE
CL	CONTINUOUS LOAD	PB	PUSH BUTTON, PULL BOX
CKT	CIRCUIT	PH, ø	PHASE
CNTL	CONTROL	PLC	PROGRAMMABLE LOGIC CONTROLLER
CO	CONDUIT ONLY	PS	PRESSURE SWITCH
CPT	CONTROL POWER TRANSFORMER	PVC	POLYVINYL CHLORIDE
DTL	DETAIL	R&S	REMOVE AND SALVAGE
DWG	DRAWING	R&W	REMOVE AND WASTE
E	EXISTING	RECPT	RECEPTACLE
G, GND	GROUND	REQ'D	REQUIRED
GFP	GROUND–FAULT PROTECTION	SPD	SURGE PROTECTIVE DEVICE
GFCI	GROUND–FAULT CIRCUIT INTERRUPTER	SSRV	SOLID STATE REDUCE VOLTAGE
HP	HORSEPOWER	SW	SWITCH
HPS	HIGH PRESSURE SODIUM	TB	TERMINAL BOARD
HZ	HERTZ	TTB	TELEPHONE TERMINAL BOARD
JB	JUNCTION BOX	TYP	TYPICAL
KVA	KILOVOLT–AMPERES	UG	UNDERGROUND
KW	KILOWATT	UON	UNLESS OTHERWISE NOTED
LA	LIGHTNING ARRESTER	V	VOLT
LED	LIGHT EMITTING DIODE	W	WATTS, WIRE
LT	LIQUID TIGHT	W/	WITH
LTG	LIGHTING	WP	WEATHERPROOF
		XFMR	TRANSFORMER

UTILITY DIVISION OF WORK

DESCRIPTION OF WORK	ELECTRICAL CONTRACTOR	UTILITY COMPANY
PRIMARY CONDUITS	√	
PRIMARY CONDUCTORS		√
PRIMARY UTILITY VAULTS (IF SHOWN)	√	
SECONDARY CONDUITS	√	
SECONDARY CONDUCTORS		√
TRANSFORMER PAD	√	
TRANSFORMER		√
TRANSFORMER CONNECTIONS		√
BOLLARDS	√	
METER ENCLOSURE AND BASE	√	
UTILITY METER		√
CT ENCLOSURE	√	
CURRENT TRANSFORMERS (CT)		√
METER ROOM LOCKBOX	N/A	

POWER UTILITY INFORMATION

UTILITY COMPANY	NVE
CONTACT NAME	STEVE GHIGLIERI
PHONE NUMBER	(775) 834-5248
FAX NUMBER	
EMAIL	SGIGLIERI@NVENERGY.COM
STREET ADRESS	1 OHM PLACE
CITY, STATE ZIP+4	RENO, NV 89520

TELCO/ DATA UTILITY INFORMATION

UTILITY COMPANY	
CONTACT NAME	
PHONE NUMBER	
FAX NUMBER	
EMAIL	
STREET ADRESS	
CITY, STATE ZIP+4	

BID SET
OCTOBER 2016

CONDUIT AND CABLE SCHEDULE

CONDUIT TAG	FROM	TO	PARALLEL RACEWAY QTY	CONDUIT SIZE	CONDUIT TYPE	POWER QTY	POWER SIZE	GROUND WIRE	CONTROL QTY	CONTROL SIZE	SIGNAL QTY	SIGNAL SIZE	REMARKS
A01	PLC	LT	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A02	PLC	AIT-PH 1	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A03	PLC	AIT-CL	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A04	PLC	AIT-PH 2	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A05	PLC	PT	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A06	PLC	C02 MIXING PANEL	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A07	PLC	NAOCL PUMP 1	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A08	PLC	NAOCL PUMP 2	1	3/4"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
A09	PLC	CO2 STORAGE TANK	1	1"	PVC40/RMC	-	-	-	-	-	2	#16TSP	
A10	PLC	STUB UP IN BUILDING	4	2"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE, (F) RTU
A11	SIGNAL PULLBOX	STUB OUT	2	2"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE, (F) TANK 2
A12	PLC	SERVICE POWER PANEL	1	1"	PVC40/RMC	-	-	-	-	-	1	#16TSP	
C01	PLC	ZS CHEM ROOM	1	3/4"	PVC40/RMC	-	-	#16	2	#16	-	-	
C02	ZS CHEM ROOM	ZS PUMP ROOM	1	3/4"	RMC-PVC	-	-	#16	2	#16	-	-	PVC COATED COND
C03	PLC	CO2 STORAGE TANK	1	1"	PVC40/RMC	-	-	#16	2	#16	-	-	
C04	PLC	STUB UP IN BUILDING	4	2"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE, (F) RTU
C05	SIGNAL PULLBOX	STUB OUT	2	2"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE, (F) TANK 2
C06	PLC	BOOSTER PUMP 1 STARTER	1	1"	PVC40/RMC	-	-	#16	8	#16	-	-	
C07	PLC	BOOSTER PUMP 2 STARTER	1	1"	PVC40/RMC	-	-	#16	8	#16	-	-	
C08	PLC	SERVICE POWER PANEL	1	3/4"	PVC40/RMC	-	-	#16	10	#16	-	-	
L01	PANEL LP-B	EXHAUST FAN 1	1	3/4"	RMC-PVC	2	#12	#12	-	-	-	-	PVC COATED COND
L02	PANEL LP-B	RCPT - IRR CONTROLLER	1	3/4"	PVC40/RMC	2	#12	#12	-	-	-	-	
L03	PANEL LP-B	RCPT - NAOCL PUMP 1	1	3/4"	PVC40/RMC	2	#12	#12	-	-	-	-	
L04	PANEL LP-B	RCPT - NAOCL PUMP 2	1	3/4"	PVC40/RMC	2	#12	#12	-	-	-	-	
L05	PANEL LP-B	EXHAUST FAN 2	1	3/4"	RMC	2	#12	#12	-	-	-	-	
L06	PANEL LP-B	C02 MIXING PANEL	1	3/4"	PVC40/RMC	2	#12	#12	-	-	-	-	
P01	NVE TRANSFORMER	SERVICE POWER PANEL	2	4"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE, PER NVE
P02	MTS	GENERATOR CONN BOX	1	4"	PVC40/RMC	3	#500	#3	-	-	-	-	
P03	SERVICE POWER PANEL	C02 STORAGE TANK	1	1"	PVC40/RMC	2	#6	#10					
P04	SERVICE POWER PANEL	UNIT HEATER 1	1	1"	PVC40/RMC	2	#10	#10	-	-	-	-	
P05	SERVICE POWER PANEL	UNIT HEATER 2	1	1"	PVC40/RMC	2	#10	#10	-	-	-	-	
P06A	SERVICE POWER PANEL	BOOSTER PUMP 1 STARTER	1	1"	PVC40/RMC	3	#12	#12					
P07A	SERVICE POWER PANEL	BOOSTER PUMP 2 STARTER	1	1"	PVC40/RMC	3	#12	#12	-	-	-	-	
P06B	BOOSTER PUMP 1 STARTER	BOOSTER PUMP 1	1	1"	PVC40/RMC	3	#12	#12	-	-	-	-	
P07B	BOOSTER PUMP 2 STARTER	BOOSTER PUMP 2	1	1"	PVC40/RMC	3	#12	#12	-	-	-	-	
P09	SERVICE POWER PANEL	WATER HEATER	1	1"	PVC40/RMC	3	#10	#10	-	-	-	-	
P10	SERVICE POWER PANEL	(E) TERM TANK LP PANEL	1	1.25"	PVC40/RMC	3	#2	#6	-	-	-	-	
P11	(E) TERM TANK LP PANEL	PANEL LP-B	1	1.25"	PVC40/RMC	3	#2	#6	-	-	-	-	
P12	PLC	AIT-PH1	1	1"	PVC40/RMC	2	#12	#12	-	-	-	-	
P13	PLC	AIT-CL	1	1"	PVC40/RMC	2	#12	#13	-	-	-	-	
P14	PLC	AIT-PH2	1	1"	PVC40/RMC	2	#12	#12	-	-	-	-	
P15	POWER PULLBOX	STUB OUT	2	2"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE, (F) TANK 2
P16	SERVICE POWER PANEL	POWER PULLBOX	4	1"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE
P17	PANEL LP-B	STUB UP IN BUILDING	1	1"	PVC40/RMC	-	-	-	-	-	-	-	PULLROPE, (F) RTU

LIGHTING FIXTURE SCHEDULE

TYPE		MANUFACTURER/ CATALOG NO.	VOLTS	BALLAST TYPE	NO. LAMPS/ LAMP TYPE	LAMP WATTAGE	FIXTURE WATTAGE	MOUNTING	DESCRIPTION
A		LITHONIA LIGHTING FEM4 LED	120	LED DRIVER	LED	4000 LUMENS	61	SURFACE	SURFACE MOUNT LED FIXTURE WITH ACRYLIC LENS AND FIBERGLASS HOUSING. UL LISTED FOR WET LOCATIONS
B		LITHONIA TWHLED20C50K	120	LED DRIVER	LED	7000 LUMENS	72	WALL	OUTDOOR LED FIXTURE, TEMPERED GLASS LENS, DIE-CAST ALUMINUM HOUSING. UL LISTED FOR WET LOCATIONS. BRONZE FINISH WITH PHOTOCELL.

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. PO–002109
DESIGNED LVH
DRAWN HAM
DATE OCTOBER 2016
CHECKED LVH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
1355 CAPITAL BLVD. / PO BOX 30013
RENO, NEVADA 89520–3013
PH 775–834–8080 / FX 775–834–8003

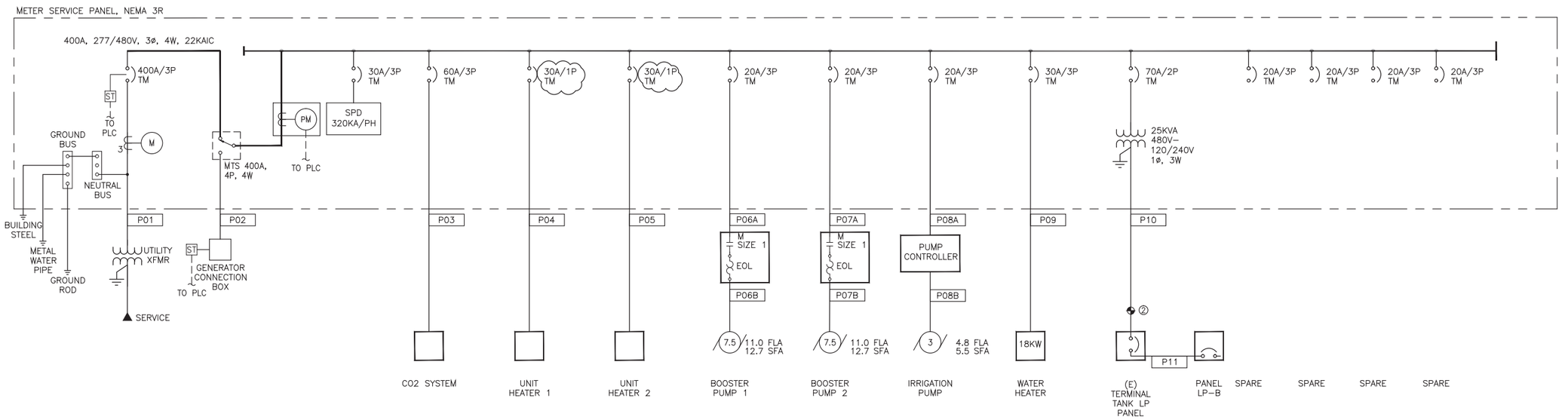
TERMINAL TANK pH ADJUSTMENT SYSTEM

ELECTRICAL SYMBOLS, ABBREVIATIONS & SCHEDULES

REGISTERED PROFESSIONAL ENGINEER
LONG V. HOANG
No. 013006
EXP. 6–30–17
ELECTRICAL
STATE OF NEVADA

SHEET NUMBER
E001
35 OF 46

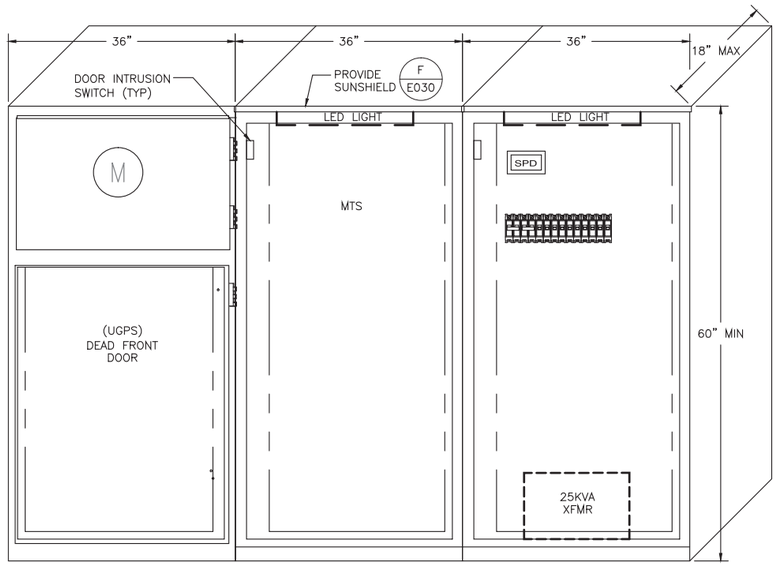
BID SET
OCTOBER 2016



ONE LINE DIAGRAM

SCALE: NONE

A E002



SERVICE PANEL ELEVATION

SCALE: NONE

B E002

LOAD CALCULATION

LOAD CENTER: SERVICE POWER PANEL — **480 VAC, 3 PHASE SERVICE** — **4 WIRE**

FED FROM:				CONNECTED			UTILITY		GENERATOR	
EQUIPMENT NUMBER	HP	MOTOR CONTROL	EQUIPMENT DESCRIPTION	LOAD (AMPS)	QTY	LOAD (KVA)	RUN QTY	RUN (KVA)	RUN QTY	RUN (KVA)
		CB	EXISTING TERMINAL TANK PANEL	133.2	1	110.7	1	110.7	1	110.7
		CB	CO2 SYSTEM	45.0	1	37.4	1	37.4	1	37.4
	20KW	CB	WATER HEATER	24.1	1	20.0	1	20.0	1	20.0
	5KW	CB	UNIT HEATER	18.0	2	29.9	2	29.9	2	29.9
	7.5	CB	CARRIER WATER PUMP	11.0	2	18.3	2	18.3	2	18.3
	3	CB	IRRIGATION PUMP	4.8	1	4.0	1	4.0	1	4.0
SUBTOTAL						220.4		220.4		220.4
LARGEST MOTOR @ 25%					HP			27.7		
TOTAL								248.1		220.4

3 PHASE CURRENT	298 AMPS
	100% MAXIMUM LOAD CURRENT
CALCULATED SERVICE SIZE	298 AMPS
MAIN BREAKER SIZE	400 AMPS
% MAIN BREAKER LOAD	75%

SHEET NOTES:

① MODIFY PANEL CB AND NAMEPLATE SCHEDULE AS NOTED.

② INTERCEPT EXISTING LP AND RECONNECT TO NEW SERVICE POWER PANEL.

①

LOCATION (E) SERVICE PANEL — **MAIN BKR** 150A
VOLTAGE 120/240 — **SYSTEM** 1Φ, 3W
TRIM SURFACE — **BUS RATING** 225A

				PHASE LOADS-AMPS						
CKT	LOAD	VA	AMPS	CB	A	B	CB	AMPS	VA	LOAD	CKT
1	~~CHLORINE SHED % TIMER~~ **SPARE**		0.0	20/1	0.0		20/1	0.0		~~CHLORINE SHED HEATER~~ **SPARE**	2
3	~~CHLORINE SHED GFI~~ **SPARE**		0.0	20/1		0.0	20/1	0.0		~~CHLORINE SHED HEATER~~ **SPARE**	4
5	~~CHLORINE SHED LIGHTS~~ **SPARE**		0.0	20/1	0.0		20/1	0.0		~~CHLORINE SHED GFI~~ **SPARE**	6
7	~~SPARE TO CHLORINE SHED~~ **SPARE**		0.0	20/1		0.0	20/1	0.0		~~CHLORINE SHED GFI~~ **SPARE**	8
9	DC CATHODIC	2000	16.7	30/1	24.2		20/2	7.5	900	MIXER MOTOR IN TANK	10
11	DC CATHODIC	2000	16.7	30/1		24.2		7.5	900		12
13	MAIN CABINET FANS	500	4.2	20/1	9.2		20/1	5.0	600	PLC	14
15	MAIN CABINET LIGHTS	200	1.7	20/1		6.7	20/1	5.0	600	PLC	16
17	MAIN CABINET HEATERS	1200	10.0	20/1	10.0		20/1	0.0		~~CHLORINE ANALYZER CAB HEATERS~~ **SPARE**	18
19	UPS	500	4.2	20/1		4.2	20/1	0.0		~~CHLORINE ANALYZER CAB OUTLET~~ **SPARE**	20
21	~~IRRIGATION PUMP CONTROLLER~~	3292	27.4	~~20/2~~	27.4		20/1	0.0		~~IRRIGATION TIMER~~ **SPARE**	22
23	**(N) SUB PANEL LP-B**	3292	27.4	**100/2**		27.4	15/1	0.0		~~IRRIGATION PUMP HEAT TAPE GFI~~ **SPARE**	24
25	SPACE				0.0					SPACE	26
27	SPACE					0.0				SPACE	28
29	SPACE				0.0					SPACE	30

Notes		A	B			
(L)	**Lockout Provision Required**	**71 A**	**62 A**			
(H)	**HACR - Rated Breaker**	**8492 VA**	**7492 VA**			
(GFI)	**Ground Fault Interupt Rated Breaker**	**PHASE LOADS**		**AVERA**	**67 A**	
(AFI)	**Arc-Fault Interupt Rated Breaker**	**106%**	**94%**	**TOTAL**	**15984 VA**	

PANEL SCHEDULE - LP B

LOCATION (N) PUMP CHEMICAL BUILDING — **MAIN BKR** 100A
VOLTAGE 120/240 — **SYSTEM** 1Φ, 3W
TRIM SURFACE — **BUS RATING** 125A

					PHASE LOADS-AMPS						
CKT	LOAD	VA	AMPS	CB	A	B	CB	AMPS	VA	LOAD	CKT
1	LIGHT - CHEMICAL/PUMP ROOM	200	1.7	20/1	16.7		20/1	15.0	1800	NAOCL PUMP 1 RECEPTACLE	2
3	LIGHT - EXTERIOR	144	1.2	20/1		16.2	20/1	15.0	1800	NAOCL PUMP 2 RECEPTACLE	4
5	RECEPTACLES - CONVENIENCE	360	3.0	20/1	3.5		20/1	0.5	60	IRRIGATION CONTROL RECEPTACLE	6
7	EXHAUST FAN, EF-1	510	4.3	20/1		14.3	20/1	10.0	1200	CO2 FEED PANEL	8
9	EXHAUST FAN, EF-2	510	4.3	20/1	4.3		20/1	0.0		SPARE	10
11	SPARE		0.0	20/1		0.0	20/1	0.0		SPARE	12
13	SPARE		0.0	20/1	0.0		20/1	0.0		SPARE	14
15	SPARE		0.0	20/1		0.0	20/1	0.0		SPARE	16
17	SPARE		0.0	20/1	0.0		20/1	0.0		SPARE	18
19	SPARE		0.0	20/1		0.0	20/1	0.0		SPARE	20
21	SPARE		0.0	20/1	0.0		20/1	0.0		SPARE	22
23	SPARE		0.0	20/1		0.0	20/1	0.0		SPARE	24

Notes		A	B			
(L)	**Lockout Provision Required**	**24 A**	**30 A**			
(H)	**HACR - Rated Breaker**	**2930 VA**	**3654 VA**			
(GFI)	**Ground Fault Interupt Rated Breaker**	**PHASE LOADS**		**AVERA**	**27 A**	
(AFI)	**Arc-Fault Interupt Rated Breaker**	**89%**	**111%**	**TOTAL**	**6584 VA**	

REVISION	DESCRIPTION	BY	APP	DATE

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DRAWN HAM
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TERMINAL TANK pH ADJUSTMENT SYSTEM

ONE LINE DIAGRAM, SCHEDULES AND ELEVATION

REGISTERED PROFESSIONAL ENGINEER — LONG V. HOANG — No. 019006 — EXP. 6-30-17 — ELECTRICAL — STATE OF NEVADA

SHEET NUMBER
E002
36 OF 46

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