SANTA FE SOLID WASTE MANAGEMENT AGENCY

REQUEST FOR BIDS

BID NO. '17/42/B

FOR

BUCKMAN ROAD RECYCLING AND TRANSFER STATION

WATER LINE AND MISTING SYSTEM IMPROVEMENTS

MAY 19, 2017

BIDS DUE:
JUNE 23, 2017 at 2:00 P.M.
PURCHASING OFFICE
CITY OF SANTA FE
2651 SIRINGO ROAD – BUILDING H
SANTA FE, NEW MEXICO 87505

BUCKMAN ROAD RECYCLING AND TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS
BID NO. '17/42/B

TABLE OF CONTENTS

CONTRACT DOCUMENTS

TABLE OF CONTENTS
(Continued)

TECHNICAL SPECIFICATIONS

CONSTRUCTION PLAN INDEX

DRAWING	TITLE
-	Cover Sheet, Vicinity Map and Site Location Map
G-1	General Notes and List of Drawings
P-1	Plumbing Legends, Symbols, Notes, Schedules and Abbreviations
P-2	Tipping Building Demolition Plan
P-3	Tipping Building Tunnel and Hopper Area Demolition Plumbing Plan
P-4	Administration Building Demolition Plumbing Plan
P-5	Tippling Building Plumbing Plan
P-6	Tipping Building Tunnel and Hopper Area Plumbing Plan
P-7	Miscellaneous Plumbing
PD-1	Plumbing Details I
PD-2	Hopper Dust Suppression System Plan and Details
PD-3	Overhead Dust Suppression System and Miscellaneous Details
E-1	Electrical Legends and Abbreviations I
E-2	Electrical Legends and Abbreviations II
E-3	Electrical Single Line Diagram
E-4	Electrical MCC Elevation
E-5	Electrical Schedules
E-6	Electrical Schematics
E-7	Tipping Building Electrical Power Plan I
E-8	Tipping Building Power Plan II
E-9	Administration Building Electrical Room Enlarged Plan
E-10	Tipping Building Heat Trace Isometric Plan
E-11	Electrical Details

Section 1
Invitation to Bid

SANTA FE SOLID WASTE MANAGEMENT AGENCY
ADVERTISEMENT FOR BIDS

INVITATION TO BID NO.:	**'17/42/B**
SEALED BID FOR:	Santa Fe Solid Waste Management Agency (SFSWMA) Buckman Road Recycling and Transfer Station (BuRRT) Water Line and Misting System Improvements
BID SCHEDULE	Advertisement: May 19, 2017 Issuance of Bid Packages: May 19, 2017 Pre-Bid Conference: June 5, 2017 @ 10:00 a.m. Bid Opening: June 23, 2017 @ 2:00 p.m. Bid Award (Joint Powers Board): July 20, 2017 Notice to Proceed: August 7, 2017 (Estimated)
TO BE OPENED AT:	City Purchasing Office City of Santa Fe 2651 Siringo Road, Building H Santa Fe, NM 87505
TIME:	2:00 p.m. Local Prevailing Time
DATE:	June 23, 2017
ADDRESSED TO:	Mr. Robert Rodarte Purchasing Director City of Santa Fe 2651 Siringo Road, Building H Santa Fe, NM 87505

PRE-BID CONFERENCE: A non-mandatory pre-bid conference will be held at 10:00 a.m. on June 5, 2017, at the Buckman Road Recycling and Transfer Station, 2600 Buckman Road, Santa Fe, NM 87507. The pre-bid conference will provide significant aspects of the project and address any potential bidder questions. Immediately after the pre-bid conference, bidders may participate in an optional site visit of the water line and misting system improvements project with representatives from CDM Smith Inc. (Engineer) and Santa Fe Solid Waste Management Agency (Owner).

The work to be performed for this project consists of furnishing all equipment, labor and materials for the construction of the Buckman Road Recycling and Transfer Station Water Line and Misting System Improvements in accordance with the Construction Plans, Specifications, and other Contract Documents ("Work").

Bids will be received until the above time, then opened publicly at the City of Santa Fe Purchasing Office, 2651 Siringo Road, Building H, Santa Fe, New Mexico and read aloud. Bids received after the above time will be returned unopened.

Contract Documents may be reviewed at the following address:

Santa Fe Solid Waste Management Agency
Attn: Rosalie Cardenas
149 Wildlife Way
Santa Fe, NM 87506
(505) 424-1850
Email: rcardenas@sfswma.org

OBTAINING COPIES OF CONTRACT DOCUMENTS: Construction plans, specifications and other contract documents ("Contract Documents") may be obtained at the following address:

Academy Reprographics
8900-N San Mateo Blvd NE
Albuquerque, NM 87113
Phone: (505) 821-6666
Email: plot@acadrepro.com

Prospective bidders may go directly to Academy Reprographics' web site (www.acadrepro.com) to review or obtain (for a fee) a complete set of the Contract Documents, including construction plans and specifications. Bidders are advised that the cost of the CD and/or any costs to reproduce hard copies of the Contract Documents or portions thereof are non-refundable. Bidders may also view the Contract Documents at http://www.santafenm.gov/bids.aspx.

Bids for the project will be presented in the form of a unit price or lump sum bid as indicated on the **Bid Form**. The bidder shall bid all items listed. Each bidder must conform to the conditions specified in the section entitled **Instructions for Bidders.**

BID GUARANTEE: Each bid shall be accompanied by an acceptable form of bid Guarantee (Bid Security) in an amount equal to at least five percent (5%) of the amount of the bid payable to the Santa Fe Solid Waste Management Agency as a guarantee that if the bid is accepted, the Bidder will execute the Contract and file acceptable **Performance and Labor and Material Payment Bonds** within fifteen (15) days after the award of the Contract.

The bid shall also include a signed **Non-Collusion Affidavit of Prime Bidder**, a signed **Certificate of Bidder Regarding Equal Employment Opportunity**, **Certificate of Nonsegregated Facilities**, and **Acknowledgement for Receipt of Addenda**. The successful Bidder shall, upon notice of award of Contract, secure from each of its subcontractors a signed **Non-Collusion Affidavit of Subcontractor**. Bidders must possess an applicable license to perform the Work under the Contract, provided for in the New Mexico Construction Industries Rules and Regulations.

The Work shall be complete within sixty (60) calendar days following issuance of a notice-to-proceed to the successful Bidder. Following the sixty (60) calendar day contract time, SFSWMA will impose liquidated damages for failure to comply with this time limit, as specified in the Contract Documents.

Performance Bond and Labor & Material Payment Bond, each 100% of the Contract sum, will be required of the successful Bidder entering into the construction Contract.

Bidders agree to hold their bid prices for sixty (60) days subject to action by the Owner.

OWNERS RIGHTS RESERVED: The Santa Fe Solid Waste Management Agency, herein referred to as the Owner, reserves the right to reject any or all bids and to waive any formality or technicality in any bid in the best interest of the Owner.

Wages paid on this project shall not be less than the minimum prevailing wage rates listed in the Contract Documents.

To receive a resident or resident veteran contractor preference pursuant to Section 13-4-2 NMSA 1978, a resident or resident veteran contractor shall submit with its bid a copy of a valid resident or resident veteran contractor certificate issued by the New Mexico Taxation and Revenue Department pursuant to Section 13-1-22 NMSA 1978.

EQUAL OPPORTUNITY IN EMPLOYMENT: All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, or national origin. Bidders on this work will be required to comply with the Presidents Executive Order No. 11246 as amended.

ATTEST:

Robert Rodarte, Purchasing Officer

Received by the Santa Fe New Mexican on: May 16, 2017
To be published on: May 19, 2017

Received by the Albuquerque Journal on: May 16, 2017
To be published on: May 19, 2017

Section 2
Instructions to Bidders

INSTRUCTIONS FOR BIDDERS

Bids are requested by the Santa Fe Solid Waste Management Agency for construction of the Buckman Road Recycling and Transfer Station Water Line and Misting System Improvements in accordance with the construction plans, specifications and contract documents.

1. LOCATION AND DESCRIPTION OF WORK: The Work under this Contract shall be performed on-site at the Buckman Road Recycling and Transfer Station, 2600 Buckman Road, Santa Fe, New Mexico 87507. The Work consists of construction for water line and misting system improvements, including demolition of existing water lines and appurtenances, tempered water system improvements, potable water system improvements, overhead dust suppression system, and electrical systems for tempered and potable water systems and overhead dust suppression system, as shown and specified in the Contract Documents.
2. TIME AND PLACE OF RECEIVING AND OPENING BIDS: This information will be found in the "Advertisement for Bids" form attached hereto. A bid received after the specified time will not be considered and will be returned to the bidder unopened.
3. SPECIFICATIONS: The construction of this project will be in accordance with the General and Supplemental Conditions, Construction Plans and Technical Specifications contained in the Contract Documents.
4. CONTRACT DOCUMENT DEPOSIT: Prospective bidders may go directly to Academy Reprographics' web site (www.acadrepro.com) to review or obtain (for a fee) a complete set of the Contract Documents, including construction plans and specifications. Bidders are advised that the cost of the CD and/or any costs to reproduce hard copies of the Contract Documents or portions thereof are non-refundable.
5. DEFINED TERMS: Terms used in these Instructions to bidders have the meanings assigned to them in this Request for Bids.
6. EXAMINATION OF CONTRACT DOCUMENTS AND SITE: Before submitting the bid, each bidder must (a) examine the Contract Documents thoroughly, (b) visit the site to familiarize itself with local conditions that may in any manner affect performance of the Work, (c) become familiar with Federal, State and local laws, ordinances, rules and regulations affecting performance of the Work; and (d) carefully correlate the bidder's observations with the requirements of the Contract Documents. The submission of a bid constitutes representation by Bidder that Bidder has complied with every requirement of this section and that the Contract Documents are sufficient in scope to indicate and convey understanding of all terms and conditions for performance of the Work.
7. THE COMPLETE CONTRACT DOCUMENTS CONTAIN THE FOLLOWING: Everything that is contained herein, as well as General and Supplemental Conditions, Construction Plans and Technical Specifications referenced herein.
8. INTERPRETATIONS, ADDENDA AND AMENDMENTS: Any prospective bidder who desires to receive notice of interpretations, addenda, or amendments to this Request for Bids shall provide contact information to the Owner. All questions about the meaning or intent of the Contract Documents shall be submitted to the Owner in writing or e-mailed to Gregory Larson, P.E., larsongs@cdmsmith.com. Replies will be issued by Addenda mailed, emailed, or faxed to all parties recorded by the Owner as having provided their contact information at

least two (2) days before the Addenda is sent. Questions received less than five (5) days prior to the date for opening of bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. The Owner reserves the right to amend these time frames if a critical Addendum is required or if the proposal deadline needs to be extended in the best interest of the Owner.

9. BID SECURITY: Bid Security (bid guarantee) in the amount of 5% of the amount of the bid shall accompany the Bid Form and must be in the form of a certified or bank cashier's check made payable to the Owner or a bid bond issued by a surety licensed to conduct business in the State of New Mexico, or otherwise supplied in a form satisfactory to the Owner. The Bid Security of the successful Bidder will be retained until the Bidder has executed the Construction Agreement and furnished the required Contract Security (Performance and Labor and Material Payment Bonds), whereupon it will be returned. If the Bidder fails to execute and deliver the Construction Agreement and furnish the required Contract Security within ten (10) days of the Notice of Award, the Owner may annul the Notice of Award and the Bid Security of that Bidder will be forfeited. The Bid Security of any Bidder whom the Owner believes to have a reasonable chance of receiving the award may be retained by the Owner until either the seventh day after the executed Construction Agreement is delivered by the Owner to Contractor and the required Contract Security is furnished; or the sixty-first (61) day after the bid opening, whichever is earlier. Bid Security of other Bidders will be returned within fifteen (15) days of the bid opening, or sooner.

10. RESIDENT PREFERENCE:

    INTENT AND POLICY: The Owner recognizes that the intent of the state resident preference statute is to give New Mexico businesses and contractors an advantage over those businesses, manufacturers and contractors from outside the State of New Mexico. The underlying policy is to give a preference to those persons and companies who contribute to the economy of the State of New Mexico by maintaining plants and other facilities within the State and giving employment to residents of the State (1969 OP. Attorney. Gen. No. 6942).

    APPLICATION: With acknowledgement of this intent and policy, the resident preference will only be applied when bids are received from in state businesses, manufacturers and contractors that are within five (5) percent of low bids received from out-of-state businesses, manufacturers and contractors (NMSA 1978, §§ 13-1-21 and 13-4-2).

    To be considered a resident for application of the preference, the in-state Bidder must include a valid resident business certificate or resident contractor certificate with the submitted bid.

    NON-APPLICATION OF RESIDENT PREFERENCES:

    If the lowest responsive bid and the next responsive bids within five (5) percent of the lowest bid are all from bidders who have submitted a resident business certificate or a resident contractor certificate, then the resident preference will not be applied

    Preferences shall not be applied when expenditures of Federal funds designated for a specific contract is involved.

    NEW MEXICO RESIDENT VETERAN PREFERENCE: New Mexico law, NMSA 1978, § 13-1-22, provides a preference in the award of a public works contract for a "resident veteran business." Certification by the NM Department of Taxation and Revenue for the resident

veteran business requires the Offeror to provide evidence of annual revenue and other evidence of veteran status.

An Offeror who wants the veteran business preference to be applied to its proposal is required to submit with its proposal the certification from the NM Department of Taxation and Revenue and the sworn affidavit attached hereto in Section 3, Bid Proposal.

If an Offeror submits with its proposal a copy of a valid and current veteran resident business certificate, 7%, 8%, or 10% of the total weight of all the evaluation factors used in the evaluation of proposal may be awarded as set forth in NMSA 1978, § 13-1-21 and 13-1-22.

The resident business or contractor preference is not cumulative with the resident veteran business preference.

11. CONTRACT TIME: The number of days for the completion of Work (the Contract Time) is sixty (60) calendar days as set forth in the Bid Proposal and will be included in the executed Construction Agreement.

12. SUBCONTRACTORS, SUPPLIERS AND OTHERS:

A. Contractor, in the bid documents, must identify in writing to the Owner those portions of the Work that are proposed to be subcontracted and after the Notice of Award, may only subcontract other portions of the work with the Owner's written consent.

B. Contractor shall list all Subcontractor names, addresses and type of work to be performed.

C. The Subcontractor threshold amount for this project is $5,000. Contractor must list all subcontractors who will perform work in excess of this threshold. Only one Subcontractor may be listed for each category of work as defined by Contractor. The Subcontractors Fair Practices Act (NMSA 1978, §§13-4-31 thru 13-4-42) shall apply.

D. EXEMPTION: In accordance with the "SUBCONTRACTOR'S FAIR PRACTICES ACT", Section 13-4-35, Contractor shall not be required to submit a Subcontractor's Listing form with the bid for contracts for construction, improvement or repair of streets or highways, including bridges, underground utilities within easements, including but not limited to waterlines, sewer lines and storm sewer lines. The SUBCONTRACTOR'S FAIR PRACTICES ACT shall apply, however, to that portion of contracts for construction, improvement or repair of streets or highways which covers street lighting and traffic signals.

E. The Bidder shall list the Subcontractor(s) or material supplier(s) proposed to be used for all trades or items on the Subcontractor Listing Form attached to the Bid Form. The listing must include Subcontractors specifically identified in Paragraph D above. If awarded the contract, the Bidder shall use the firm listed, or itself if "General Contractor" has been listed, unless a request for a change or substitution is approved by the Owner of any reason as outlined herein.

F. For subcontract work involving the application of the "SUBCONTRACTORS FAIR PRACTICES ACT," NMSA 1978 §§13-4-31thru 13-4-42 the following provisions, shall apply:

1. Contractor may not substitute any Subcontractor listed, unless the Owner approves, in writing, the substitution based on the following situations:

a. The Subcontractor fails or refuses to execute a contract due to bankruptcy or

insolvency;

b. The Subcontractor fails or refuses to perform;

c. Contractor demonstrates to the Owner that the listed Subcontractor was due to an inadvertent clerical error;

d. Acceptance of an alternate by the Owner causes the original Subcontractor's bid not to be low;

e. Contractor can substantiate to the Owner that a Subcontractor's bid is incomplete, or;

f. The Subcontractor fails or refuses to meet bond requirements of Contractor.

2. Prior to approval of Contractor's request for substitution, the Owner shall give notice to the listed Subcontractor by certified mail. The Subcontractor shall have five (5) working days to submit written objections to the Owner. Failure to respond shall constitute Subcontractor's consent to the substitution. If written objections are received, the Owner shall give five (5) working days of a notice of a hearing.

3. No other substitution of Subcontractors may be permitted by Contractor, other than for requested change orders to the Work or unless Contractor can show that no bids were received.

4. It shall be the responsibility of the Subcontractor to be prepared to submit performance or payment bonds if requested by Contractor. If the Subcontractor does not furnish such requested bonding, Contractor may substitute another Subcontractor, as per the provisions of item 1 above. (The requirement of such bonding must be included in Contractor's written or published request for Subcontract bids.)

5. If Contractor does not specify a Subcontractor, Contractor represents that Contractor shall perform the work.

6. If Contractor is claiming an inadvertent clerical error, notice shall be given to the Owner and to the involved Subcontractor within two (2) working days of the bid opening. The Subcontractor shall have six (6) working days from the bid opening to submit written objections. Failure to respond shall constitute Subcontractor's agreement that an error was made.

7. If determined to be an emergency, upon written finding, subcontracting may be permitted although not originally designated in the bid.

8. Violation of this Act may allow the Owner to cancel the Contract or assess Contractor a penalty up to ten (10) percent of the subcontract involved, but in no case less than the difference between the amount of the listed Subcontractor and the Subcontractor used. Contractor shall be entitled a hearing after the notice of intent of assess a penalty.

9. If a hearing is held, the dispute shall be stated in writing and the Owner shall evaluate the issues of both sides and render a determination within ten (10) days of the hearing and provide the parties with a written copy of the decision by certified mail. The Owner may also refer the matter to arbitration.

13. BID FORM:

    A. The Bid Form is included in the Contract Documents.

    B. The Bid Form must be completed in either ink or typewritten. The bid price of each item on the form must be stated in numerals and written words; in case of an error in extensions in the unit price schedule, the unit price shown in written words shall govern.

    C. Bids by corporations must be executed in the corporate name by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign) The corporate address and state of incorporation shall be shown below the signature.

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

    E. All names must be typed or printed below the signature.

    F. The bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).

14. QUALIFICATION OF BIDS: All Bidders must have a valid New Mexico Contractor's License appropriate to the Work herein specified.

15. SUBMISSION OF BIDS: Bids shall be submitted at the time and place indicated in the Advertisement for Bids and shall be enclosed in an opaque sealed envelope, marked with the project title, name and address of the Bidder, N.M. License Number, and accompanied by the Bid Security, list of subcontractors and other required documents. The Bid Form shall not be detached from the bound set of Contract Documents. All blanks must be filled in. Conditional bids will not be considered. The envelope shall be addressed to:

    Mr. Robert Rodarte
    Purchasing Officer
    2651 Siringo Road Bldg. H
    Santa Fe, NM 87505

16. MODIFICATION AND WITHDRAWAL OF BIDS: Bids may be modified or withdrawn by an appropriate document duly executed and delivered to the place where bids are to be submitted at any time prior to the opening of bids.

17. BID OPENING PROCEDURE: The person or persons opening the bids shall verify the following bid components are included:

    A. Bid Proposal;

    B. Bid Form and Completed Bid Schedule - Name of Bidder and Bidder's New Mexico Contractor's License with a check for proper signatures, subcontractor/material listing, and acknowledgement of Addenda, if any;

    C. Bid Bond or Check for Bid Security;

    D. Non-Collusion Affidavit of Prime Bidder;

    E. Non-Collusion Affidavit of Subcontractor(s);

    F. Certification of Nonsegregated Facilities;

    G. Certification of Bidder regarding Equal Employment Opportunity;

H. Certification of Subcontractor regarding Equal Employment Opportunity; and

I. Resident Veteran Contractor / Resident Contractor, if any.

18. BIDS TO REMAIN OPEN: If a Contract is to be awarded, it will be awarded to the lowest responsible base bid whose evaluation indicates to the Owner that the award will be in the best interests of the project and the Owner. All bids shall remain open for sixty (60) days after the day of the bid opening, but the Owner may, in its sole discretion, release any bid and return the Bid Security prior to that date.

19. AWARD OF CONTRACT:

A. The Owner reserves the right to reject any and all bids and waive any and all informalities or technicalities and the right to disregard all nonconforming or conditional bids or counter bids.

B. If a Contract is to be awarded, it will be awarded to the lowest responsible base bid whose evaluation indicates to the Owner that the award will be in the best interests of the project and the Owner. Additive Alternatives may be added in total or in part, based on available funding or timing to be exercised by the Owner at its discretion. If Alternatives are to be awarded, the Owner will award the Contract to the responsible Bidder submitting the low base bid, excluding NMGRT, including any combination of any Additive Alternates or Deductive Alternates.

C. Simultaneously with delivery of the executed counterparts of the Agreement to the Owner, Contractor shall deliver to the Owner the required Contract Bonds.

D. If a Contract is to be awarded, the Owner will give the apparent successful Bidder a Notice of Award within thirty (30) days after the day of the bid opening.

E. If the lowest responsible Bidder has otherwise qualified, the lowest Bidder may negotiate with the Owner for a lower bid if the lowest bid is within ten percent over budgeted project funds. No change in the original scope of the terms or terms and conditions will be allowed. Terms and conditions refer to the Contract requirements, warranties, and bonds. Negotiation may be permitted with product, materials, and equipment alternatives as determined to be in the best interest of the Owner.

20. WAGE RATES: The Bidder's attention is directed to the fact that wages to be paid on this project shall not be less than the prevailing wage rates as listed by the New Mexico State Labor and Industrial Commission. It shall be the successful Bidder's responsibility to inform itself thoroughly of all state, federal and local laws and statutes pertaining to the employment of labor, the freedom of organization and the conditions of employment and shall strictly adhere to such laws and regulations as are applicable. There shall be no discrimination because of race, creed, color, national origin or legal political affiliation in the employment of persons qualified by training and experience for work under this contract.

21. REQUIRED SUBMITTALS:

A. Bid Proposal;

B. Bid Form and Completed Bid Schedule - Name of Bidder and Bidder's New Mexico Contractor's License with proper signatures, subcontractor/material listing, and acknowledgement of Addenda, if any;

C. Bid Bond or Check for Bid Security;

D. Non-Collusion Affidavit of Prime Bidder;

E. Non-Collusion Affidavit of Subcontractor(s);

F. Certification of Nonsegregated Facilities;

G. Certification of Bidder regarding Equal Employment Opportunity;

H. Certification of Subcontractor regarding Equal Employment Opportunity; and

I. Resident Veteran Contractor / Resident Contractor / Local Contractor Certification (where applicable).

If any of the above requirements have not been met, the bid shall not be read.

22. SUBSTITUTIONS: The bid shall not be qualified by the bid of substitutions for specified materials or equipment.

23. OWNER PREFERENCES: In the construction of this project, the Owner has no preference for any process, type of equipment, or kind of material, but will consider all processes, types of equipment or kinds of material offered on a usual competitive basis if they are in fact the equal to that specified and will accomplish the purpose intended. The Owner reserves the right to be the sole judge as to whether or not a different process, type of equipment or kind of material offered is in fact equal to that specified.

24. LICENSE OR ROYALTY FEES: Licenses and/or royalty fees for products or for processes must be paid for directly by Contractor.

25. PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND: Contractor will be required to furnish surety bonds in an amount at least equal to one hundred percent (100%) each of the total Contract price as security for faithful performance of the Contract and payment for all labor and materials. The surety company must be authorized to do business in the State of New Mexico and must be acceptable to the Owner.

26. ADDENDUM: Each Addendum shall be made a part of the Contract Documents to the same extent as though contained in the original Documents and itemized listing thereof. Each Bidder shall acknowledge receipt of each Addendum in the space provided on the Bid Form.

27. COLLUSION: No Bidder shall be interested in more than one bid. Collusion among Bidders or the submission of more than one bid under different names by any firms or individual shall be cause for rejection of all bids in question without consideration.

28. QUANTITIES: The quantities set forth in the Bid Form are estimated quantities on which bids will be compared and which will be the basis for Award of Contract. Payment will be made for the Work actually performed.

29. UTILITY INSPECTION: All work done on the existing Owner owned utilities shall be inspected by a representative of the Owner before backfilling.

30. POWER OF ATTORNEY: Attorneys in fact who sign bonds must attach certified effective copies of their Power of Attorney to all bonds.

31. PRE-BID CONFERENCE: A non-mandatory pre-bid conference will be held at 10:00 a.m. on June 5, 2017, at the Buckman Road Recycling and Transfer Station, 2600 Buckman Road, Santa Fe, NM 87507, as specified in the Advertisement for Bids.

32. PROTEST PROCEDURE: Any Bidder or Contractor who is aggrieved in connection with the procurement may protest to the City Purchasing Director. The protest must be in writing and be submitted within fifteen (15) days after the facts or occurrences.

The complete procedures and requirements regarding protests and resolution of protests are available from the Purchasing Office upon request.

33. CONSIDERATION OF BIDS:

33.1 RECEIPT, OPENING AND RECORDING

Bids received on time will be opened publicly and will be read aloud, and an abstract of the amounts of the Base Bids and Alternates or Bid Items, if any, will be made available to the Bidders. Each Bid shall be open to public inspection.

33.2 BID EVALUATION AND AWARD

33.2.1 It is the intent of the Owner to award a contract to the lowest responsible base bid, provided the bid has been submitted in accordance with the requirements of the Contract Documents. The unreasonable failure of a Bidder to promptly supply information in connection with an inquiry with respect to responsibility is grounds for a determination that the Bidder is not a responsible Bidder. Post-bid information that may be required of a Contractor as to qualifications can include, but not be limited to those items listed in paragraph 33.

33.2.2 If the Base Bid is within the amount of funds available to finance the construction Contract, Contract award will be made to the responsible Bidder submitting the low Base Bid, excluding New Mexico gross receipts tax (NMGRT). If alternatives are to be awarded the Owner will award the Contract to the responsible Bidder submitting the low Base Bid, excluding NMGRT, including any combination of any Additive Alternates or Deductive Alternates.

33.2.3 Discrepancies in the Bid Form between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

33.3 COMPETITIVE SEALED BIDS

Contracts solicited by competitive sealed bids shall require that the bid amount exclude applicable New Mexico Gross Receipts Taxes or applicable local option taxes, but that the Owner shall be required to pay the applicable taxes, including any increase in the applicable tax which becomes effective after the date the Contract is entered into. The applicable Gross Receipts Tax shall be computed and shown as a separate amount on the Bid Form and on each request for payment made under the Contract.

33.4 NOTICE OF AWARD

A written Notice of Award shall be issued by the Owner after review and approval of the bid and related documents by the SFSWMA Joint Powers Board, with reasonable promptness.

33.5 IDENTICAL BIDS

When two or more of the bids submitted are identical in price and are the low bid, the Owner may:

A. Award pursuant to the multiple source award provisions of the Procurement Code;

B. Award to a resident business if the identical low bids are submitted by a resident business and a nonresident business;

C. Award to a resident manufacturer if the identical low bids are submitted by a resident manufacturer and a non-resident manufacturer;

D. Award to one of the identical low Bidders;

E. Reject all bids and re-solicit bids for the required services, construction, or items of tangible personal property.

33.6 CANCELLATION OF AWARD

When in the best interest of the public, the Owner may cancel the award of any contract at any time before the execution of said contract by all parties without any liability against the Owner.

34. POST-BID INFORMATION

34.1 RETURN OF BID SECURITY

All Bid Security in the form of checks, except those retained by the owner per paragraph 8.0 of this Instruction to Bidders will be returned within fifteen (15) days following the bid opening. The retained Bid Security of the Successful Bidder(s), if in the form of a check, will be returned after satisfactory Contract Bonds have been furnished and the Contract has been executed as stated in the above referenced paragraph 8.0. Bid Securities in the form of Bid Bonds will be returned only upon the request of the unsuccessful Bidder, but will be released by the Owner after the Notice of Award is sent by the Owner.

34.2 NOTICE TO PROCEED

The Owner will issue a written Notice to Proceed to Contractor stipulating the date from which Contract Time will be charged and the date Contract Time is to expire, subject to valid modifications of the Contract authorized by Change Order.

34.3 FAILURE TO EXECUTE CONTRACT

Failure to return the signed Contract with acceptable Contract Bonds and Certificate of Insurance within ten (10) calendar days after the date of the Notice of Award shall be just cause for the cancellation of the Award and the forfeiture of the Bid Security, which shall become payable to Owner damages sustained. Award may then be made to the next lowest responsible Bidder, or the work may be re-advertised and constructed under contract or otherwise, as the Owner may decide.

34.4 CONTRACTOR'S QUALIFICATION STATEMENT

Bidder to whom award of a Contract is under consideration shall submit, upon

request, information and data to prove that their financial resources, production or service facilities, personnel, and service reputation and experience are adequate to make satisfactory delivery of the services, construction, or items of personal property described in the Contract Documents and the form of submittal shall be a Statement of Bidder's Qualifications.

34.5 CONTRACT BONDS REQUIREMENTS

The Successful Bidder, where the Contract Price exceeds twenty five thousand dollars ($25,000), shall post a one hundred (100) percent Performance Bond and one hundred (100) percent Labor and Material Payment Bond. Bonds shall be executed on Performance Bond and Labor and Material Payment Bond forms attached hereto, with amount payable conforming to the terms of the Contract. Surety shall be a company licensed to do business in the State of New Mexico and acceptable to the Owner.

34.6 INSURANCE REQUIREMENTS

34.6.1 Contractor shall carry insurance to protect the Owner from and against all claims, demands, actions, judgments, costs, expenses and liabilities which may arise or result directly or indirectly from or by reasons of loss, injury or damage related to the Project. Contractor shall file with the Owner current certificates evidencing public liability insurance with limits as provided in the New Mexico Tort Claims Act, Section 41-4-19 NMSA 1978, and as that section or successors section may be amended from time to time. Contractor shall also carry such insurance as it deems necessary to protect it from all claims under any workmen's compensation law in effect that may be applicable to Contractor. All insurance required by the Contract shall be kept and remain in full force and effect for the entire life of the Contract.

34.6.2 The insurance coverage shall include worker's compensation, employer’s liability, comprehensive general liability (Premises-Operations, independent contractors, products and completed operations, broad form property damage, contractual liability, explosion and collapse hazard, underground hazard, personal injury) comprehensive automobile liability (owned and hired), excess liability (umbrella form), and all-risk builder's risk.

34.6.3 All insurance coverage must be maintained for the entire term of the Contract. Products and completed operations coverage shall be maintained for a minimum period of one (1) year after final payment.

34.6.4 A valid certificate of insurance must be submitted to the Owner prior to issuance of a Notice-to-Proceed.

35. MINIMUM WAGE RATES

Any Contract entered into in excess of sixty thousand dollars ($60,000) for construction, alteration, demolition, or repair, or any combination of these, including painting and decorating of public buildings or public works, is subject to the minimum wage rate determination issued by the New Mexico State Labor

and Industrial Commission for this project. Federal Funded Contracts in excess of $2,000.00 are subject to Federal Labor Standards Requirements of Davis Bacon Act. The Bidder shall ensure that, in submitting the bid, the minimum wage rate determination, included herein, has been utilized in preparing the bid.

Section 3
Bid Proposal

BID PROPOSAL
BID No. '17/42/B
BUCKMAN ROAD RECYCLING AND TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

CONTRACTOR NAME_____

ADDRESS_____

To Santa Fe Solid Waste Management Agency, State of New Mexico (Owner):

The undersigned proposes to furnish and deliver all the material and to do all the work and labor required in the construction of "Water Line and Misting System Improvements" at the Buckman Road Recycling and Transfer Station in City of Santa Fe, State of New Mexico, according to the Construction Plans and Specifications at the prices named and shown on the Bid Form.

The undersigned declares that the only person or parties interested in the bid as principals are those named herein; that the bid is made without collusion with any person, firm or corporation; that the specifications have been carefully examined, including General and Supplemental Conditions, if any, and that the undersigned has made a personal examination of the site of the work has been made, that all the necessary machinery, tools, apparatus and other means of construction will be furnished and will do all the work and finish all the materials specified in the manner and the time prescribed; that the undersigned understands that the quantities are approximate only and subject to increase or decrease, and that the undersigned is willing to perform any increased or decreased quantities of work at the unit price bid.

The undersigned hereby agrees to execute and deliver the Construction Agreement and required bonds within ten (10) days, or such further time as may be allowed in writing by the Owner after receiving notification of the acceptance of this bid, and it is hereby mutually understood and agreed that in case we do not, we forfeit the accompanying check or bid bond to the Owner as liquidated damages, and the said Owner may proceed to award the contract to others.

The undersigned hereby agrees to commence the Work within ten (10) days, or such further time as may be allowed in writing by the after notification to proceed, and to complete the Work within sixty (60) calendar days, as outlined in the Contract Documents.

The undersigned proposes to furnish Labor and Material Payment Bond and Performance Bond in the amount of one hundred (100%) percent of the Contract Amount each as surety conditioned for the full complete and faithful performance of this contract, and to indemnify and save harmless the Owner from any damage or loss of which the Owner may become liable by the default of said Contractor, or by reason of any neglect or carelessness on the part of said Contractor, its agents or employees, or by or on account of any act or omission of said Contractor, its servants, agents or employees, in performance of this contract.

_____ _____

Signature Date

Section 4
Bid Form

BID FORM
SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING AND TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS
CONTRACTING AGENCY AND OWNER

NAME: _____

ADDRESS: _____
Hereinafter called Bidder.

TO: Mr. Robert Rodarte
Purchasing Director
City of Santa Fe
2651 Siringo Road, Building H
Santa Fe, NM 87505

Hereinafter called Owner,

BID FOR: BUCKMAN ROAD RECYCLING AND TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

Santa Fe Solid Waste Management Agency: Bid No. '17/42/B

1. The Bidder has familiarized itself with the existing conditions on the Project area affecting the cost of the Work and with the Contract Documents which includes:

    a. Advertisement for Bids
    b. Instructions for Bidders
    c. Bid Proposal
    d. Bid Form
    e. Supplemental Bid Forms
    f. Construction Agreement
    g. Performance Bond
    h. Labor and Material Payment Bond
    i. General and Supplemental Conditions
    j. Technical Specifications
    k. Construction Plans.

The Bidder hereby proposes to furnish all supervision, technical personnel, labor, materials, tools, appurtenances, equipment, and services (including all utility and transportation services) required to construct and complete the improvements, all in accordance with the above listed Documents.

2. Bidder agrees to perform all work to construct the Water Line and Misting System Improvements described in the Specifications and shown on the Construction Plans for the following unit prices provided in the Bid Schedule (Unit Prices) below.

   Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.

BID SCHEDULE (UNIT PRICES)
BID NO. '17/42/B

Item No.	Estimated Quantity	Brief Description of Item With Unit Bid Price in Words	Unit Bid Price In Figures
1.	L.S.	Mobilization and Demobilization. _____ Dollars and Cents per lump sum.	$
2.	L.S.	Demolition of Existing Water Lines and Appurtenances _____ Dollars and Cents per lump sum.	$
3.	L.S.	Tempered Water System Improvements _____ Dollars and Cents per lump sum.	$
4.	L.S.	Potable Water System Improvements _____ Dollars and Cents per lump sum.	$
5.	L.S.	Overhead Dust Suppression System _____ Dollars and Cents per lump sum.	$
6.	L.S.	Electrical Improvements _____ Dollars and Cents per lump sum.	$

SUBTOTAL - BASE BID AMOUNT FOR ITEMS 1-6: $_____

NEW MEXICO GROSS RECEIPTS TAX @ 8.3125% $_____

TOTAL – BASE BID PLUS NM GROSS RECEIPTS TAX $_____

TWO COMPLETE COPIES OF THE BID SUBMITTAL IS REQUIRED

3. In submitting this bid, the Bidder understands that the right is reserved by the Owner to reject any irregular or all bids, waive any technicalities in the bids, and accept the bid deemed to be in the best interest of the SFSWMA and that the Owner intends to award one contract (if at all) for the items bid. If written notice of the acceptance of this bid is mailed, telegraphed or otherwise delivered to the undersigned within sixty (60) days after the opening thereof or at any time thereafter before this bid is withdrawn, the undersigned agrees to execute and deliver.

4. All Addenda pertaining to this project shall be acknowledged by the Bidder in the spaces provided below (Indicate none if no Addenda have been issued):

Addendum		Acknowledged by Bidder or its Authorized Representative	Date Acknowledged
No.	Date		

Failure to acknowledge receipt, as provided above, may be considered sufficient grounds for disqualification of the Bidder and rejection of the bid. A record of all Addenda and copies of same will be available to all qualified bidders from SFSWMA, 149 Wildlife Way, Santa Fe, NM, 87506, after 3:00 p.m., two (2) days prior to the letting. It shall be the bidder's responsibility to become fully advised of all Addenda prior to submitting their bid.

5. The Bidder agrees to commence work under this Contract within ten (10) days after a date to be specified in a written Notice to Proceed (NTP) from the Owner or its authorized agents, and fully complete construction of the Water Line and Misting System Improvements within sixty (60) calendar days. Bidder further agrees to substantially complete the Work or to pay liquidated damages as provided in the Contract Documents.

6. Security in the sum of five (5) percent of the amount of the bid in form of (check one):

   _____Bid Bond _____ Certified Check

   is attached hereto in accordance with the "Instructions for Bidders".

7. This Bid Form contains the following:

   A. Bid Proposal;
   B. Bid Form, subcontractor/material list, and acknowledgement of Addenda, if any;
   C. Bid Bond or Check for Bid Security;
   D. Non-Collusion Affidavit of Prime Bidder;
   E. Non-Collusion Affidavit of Subcontractor(s);
   F. Certification of Nonsegregated Facilities;
   G. Certification of Bidder regarding Equal Employment Opportunity;
   H. Certification of Subcontractor regarding Equal Employment Opportunity; and
   I. Resident Veteran Contractor / Resident Contractor / Local Contractor Certification (if applicable).

   TWO COMPLETE COPIES OF THE BID SUBMITTAL IS REQUIRED

Respectfully Submitted:

Name of Bidder_____

By:_____
(Signature)

Title: _____

Date: _____

Official Address:_____

_____

_____

Telephone No.: _____

New Mexico Contractor's License Number and Types:_____

United States Treasury Number:_____

New Mexico State Residence Preference Certification Number

if any: _____

SUBCONTRACTOR / MATERIAL LISTING

All Bidders shall comply with the New Mexico *Subcontractors Fair Practices Act, NMSA 1978 §§ 13-4-31 thru 13-4-44*.

RESIDENT VETERAN CONTRACTOR / RESIDENT CONTRACTOR / LOCAL CONTRACTOR CERTIFICATION

Check Here If Bidder Has Submitted:

___ A copy of a valid resident veteran contractor certificate with its bid to receive a resident veteran contractor preference pursuant to Section 13-4-2 NMSA 1978. If checked, please select appropriate preference based upon annual revenues:

___ A bid submitted by a resident veteran contractor with annual revenues of one million dollars ($1,000,000) or less shall be deemed to be ten percent (10%) less than the bid actually submitted.

___ A bid submitted by a resident veteran contractor with annual revenues of more than one million dollars ($1,000,000) but less than five million dollars ($5,000,000) shall be deemed to be eight percent (8%) less than the bid actually submitted, subject to the limitation that the preference shall be limited, in any calendar year, to an aggregate of ten million dollars ($10,000,000) in public works contracts from all resident veteran contractors receiving the preference.

___ A bid submitted by a resident veteran contractor with annual revenues of five million dollars ($5,000,000) or more shall be deemed to be seven percent (7%) less than the bid actually submitted, subject to the limitation that the preference shall be limited, in any calendar year, to an aggregate of ten million dollars ($10,000,000) in public works contracts from all resident veteran contractors receiving the preference.

___ A copy of a valid resident contractor certificate with its bid to receive a resident contractor preference pursuant to Section 13-4-2 NMSA 1978. (Five percent (5%) less than the bid actually submitted.)

___ A joint bid by a combination of a resident veteran, resident or nonresident contractor. If checked, state the dollar amount of goods and services that will be provided by each of the joint parties under the contract:

$_____ $_____ $_____
(Non-Resident) (Resident) (Resident Veteran)

NM Resident Veteran Contractor Number _____

NM Department of Workforce Solutions Registration Number _____

Bidder declares under penalty of perjury that this statement is true to the best of its knowledge and understands that giving false or misleading statements about material fact regarding this matter constitutes a crime.

Section 5
Bid Bond

BID BOND

A. KNOW ALL MEN BY THESE PRESENTS, THAT WE _____, hereinafter called the PRINCIPAL, and the _____, of _____ a Corporation duly organized under the laws of the State of _____, and, authorized to do business in the State of New Mexico, hereinafter called the SURETY, as SURETY are held and firmly bound unto the Santa Fe Solid Waste Management Agency, hereinafter called the OBLIGEE, in the sum of _____dollars ($_____) for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted the accompanying bid, dated _____, 2017, (Bid No.'17/42/B) for the construction of the Santa Fe Solid Waste Management Agency, Buckman Road Recycling and Transfer Station - Water Line and Misting System Improvements, 2600 Buckman Road, Santa Fe, NM 87507.

B. NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof or in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

C. SIGNED AND SEALED THIS _____DAY OF_____, 2017.

_____
BIDDER

_____ By: _____(SEAL)
WITNESS PRINCIPAL

_____ By: _____
WITNESS SURETY

_____
TITLE

Section 6
Supplemental Bid Forms

SUPPLEMENTAL BID FORMS

INDEX **PAGE**

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF NEW MEXICO

COUNTY OF _____

_____being first duly sworn, deposes and says that:

(1) The undersigned is the _____ of the Bidder that has submitted the attached Bid Proposal;

(2) The undersigned is fully informed respecting the preparation and contents of the attached Bid Proposal and of all pertinent circumstances respecting such bid;

(3) Such bid is genuine and is not a collusive or sham bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affidavit, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham bid in connection with the Contract for which the attached bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communications or conference with any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Contracting Agency or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

(SIGNED) _____

TITLE _____

SUBSCRIBED AND SWORN to before me this _____day of _____ 2017.

_____
NOTARY PUBLIC

My Commission Expires _____

SUBCONTRACTS

A. Contractor shall not execute an agreement with any subcontractor or permit any Subcontractor to perform any work included in this contract until Contractor has submitted a Non-Collusion Affidavit from the Subcontractor, which is in substantially the form that follows: (page 6-5), and has received written approval of such Subcontractor from the Owner.

B. No proposed Subcontractor shall be disapproved by the Owner except for cause.

C. Contractor shall be as fully responsible to the Owner for the acts and omissions of the Subcontractors and of persons either directly or indirectly employed by them, as Contractor is for the acts and omissions of persons directly employed by Contractor.

D. Contractor shall cause appropriate provision to be inserted in all subcontracts relative to the work to require compliance by each Subcontractor with the applicable provisions of the Contract for the improvements embraced.

E. Nothing contained in the Contract shall create any contractual relation between any Subcontractor and the Owner.

NON-COLLUSION AFFIDAVIT OF SUBCONTRACTOR

STATE OF NEW MEXICO

COUNTY OF _____

_____being first duly sworn, deposes and says that:

(1) The undersigned is the _____of_____, hereinafter referred to as "Subcontractor".

(2) The undersigned is fully informed respecting the preparation and contents of the Subcontractor's proposal submitted by Subcontractor to _____, Contractor, for certain work in connection with the_____ contract pertaining to the _____ project in _____.

(3) Such Subcontractors proposal is genuine and is not a collusive or sham proposal.

(4) Neither Subcontractor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affidavit, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham bid in connection with the Contract for which the attached bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communications or conference with any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Contracting Agency or any person interested in the proposed Contract; and

(5) The price or prices quoted in Subcontractor's proposal are fair and proper and are, not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

(SIGNED) _____

(PRINT NAME) _____

TITLE _____

SUBSCRIBED AND SWORN to before me this_____ day of_____ 2017.

_____
NOTARY PUBLIC

My Commission Expires _____

CERTIFICATION OF NON-SEGREGATED FACILITIES

(Applicable to construction contracts and related subcontracts exceeding $10,000 which are not exempt from the Equal Opportunity Clause).

The construction Contractor certifies that Contractor does not maintain or provide for its employees any segregated facilities at any of its establishments, and does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The construction Contractor certifies further that Contractor will not maintain or provide for its employees any segregated facilities at any of its establishments, and that Contractor will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The construction Contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting room, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clock, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreating or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The construction Contractor agrees that (except where Contractor has obtained identical certifications from proposed subcontractors for specific time periods) Contractor will obtain identical certifications from proposed SUBCONTRACTORS prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that Contractor will retain such certifications in its files.

(SIGNED) _____

PRINT NAME _____

TITLE _____

SUBSCRIBED AND SWORN to before me this _____day of_____2017.

_____
NOTARY PUBLIC

My Commission Expires _____

CERTIFICATION OF BIDDER REGARDING
EQUAL EMPLOYMENT OPPORTUNITY
INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F. R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract or subcontract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven (7) calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION OF BIDDER

Bidder's Name: _____

Address: _____

_____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.

   Yes _____ No _____

2. Compliance reports were required to be filed in connection with such contract or subcontract.

   Yes _____ No _____

Certification: The information above is true and complete to the best of my knowledge and belief.

_____
NAME AND TITLE OF SIGNER (PLEASE TYPE)

_____ _____
SIGNATURE DATE

CERTIFICATION OF SUBCONTRACTOR REGARDING

EQUAL EMPLOYMENT OPPORTUNITY

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F. R. 12319-25). The implementing rules and regulations provide that any bidder or perspective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract or subcontract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven (7) calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION OF SUBCONTRACTOR

Subcontractor's Name: _____

Address: _____

_____

1. Subcontractor has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.

   Yes _____ No _____

2. Compliance reports were required to be filed in connection with such contract or subcontract.

   Yes _____ No _____

Certification: The information above is true and complete to the best of my knowledge and belief.

_____

NAME AND TITLE OF SIGNER (PLEASE TYPE)

_____ _____

SIGNATURE DATE

Section 7
Agreement between Owner and Contractor

SANTA FE SOLID WASTE MANAGEMENT AGENCY

AGREEMENT BETWEEN
OWNER AND CONTRACTOR

BUCKMAN ROAD RECYCLING AND TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

This Agreement, entered into this _____day of _____, 2017, by and between the **SANTA FE SOLID WASTE MANAGEMENT AGENCY,** herein known as the Owner, and _____, herein known as Contractor for the following:

PROJECT:	Buckman Road Recycling and Transfer Station Water Line and Misting System Improvements
PROJECT No.:	‘17/42/B
ENGINEER OF RECORD:	CDM Smith Inc. 6001 Indian School Rd NE, Suite 310 Albuquerque, NM 87110

DISTRIBUTION:

OWNER	SANTA FE SOLID WASTE MANAGEMENT AGENCY
CONTRACTOR	_____
ENGINEER	CDM SMITH INC.
USER AGENCY	_____
OTHER	_____

RECITALS

WHEREAS, the Owner, through its Solid Waste Joint Powers Board, is authorized to enter into a construction contract for the project; and

WHEREAS, the Owner, has let this contract according to the established State and Local Purchasing procedures for contracts of the type and amount let; and

WHEREAS, the Solid Waste Joint Powers Board approved this contract at its meeting of _____, 2017.

The OWNER and Contractor agree:

ARTICLE 1
THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, the Conditions of the Contract (General, Supplementary, and other Conditions), the Construction Plans, the Specifications, all Addenda issued prior to and all Modifications issued after execution of this Agreement. These documents form the Contract, and all are as fully a part of the Contract as if attached to this Agreement or repeated herein.

ARTICLE 2
THE WORK

Contractor shall perform all the Work required by the Contract Documents for SFSWMA, Buckman Road Recycling and Transfer Station Water Line and Misting System Improvements, 2600 Buckman Road, Santa Fe, NM 87507.

ARTICLE 3
TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The work to be performed under this Contract shall be commenced not later than ten (10) consecutive calendar days after the date of written Notice to Proceed. Substantial Completion for the Bid Work shall be achieved within sixty (60) calendar days after the date of written Notice to Proceed [the Contract Time] except as hereafter extended by valid written Change Order by the Owner.

ARTICLE 4
CONTRACT SUM

The Owner shall pay Contractor in current funds for the performance of the Work, subject to additions and deductions by Change Order as provided in the Contract Documents, the Contract Sum of _____dollars ($_____).

The Contract Sum is determined as follows:

Base Bid Work	$_____
NM Gross Receipts Tax	$_____
TOTAL	$_____

ARTICLE 5
PROGRESS PAYMENTS

Based upon Application for Payment submitted to the Owner by Contractor and Certificates for Payment issued by the Owner, the Owner shall make progress payments on account of the Contract Sum to Contractor as provided in the Contract Documents for the period ending the last day of the month as follows:

Not later than thirty (30) days following the end of the period covered by the Application for Payment, ninety five percent (95%) of the portion of the Contract sum properly allocable to labor, materials, and equipment incorporated in the work and ninety five percent (95%) of the portion of the Contract sum properly allocable to materials and equipment suitably stored at the site or some other location agreed upon in writing for the period covered by the Application for Payment, less the aggregate of previous payments made by the Owner; and upon substantial completion of the entire work, a sum sufficient to increase the total payments to ninety-eight percent (98%) of the Contract Sum, less such amounts as the Owner shall determine for all incomplete work and unsettled claims as provided in the Contract Documents.

ARTICLE 6
LIQUIDATED DAMAGES

Should Contractor neglect, refuse, or otherwise fail to complete the work within the Contract Period of sixty (60) calendar days or any extension in the Contract thereof, Contractor agrees to pay to the Owner the amount of One Thousand dollars ($1,000) per consecutive calendar day of delay until the work is completed and accepted or until voided pursuant to the provisions of the General Conditions of the Contract, not as a penalty, but as liquidated damages for such breach of the Contract.

ARTICLE 7
FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be paid by the Owner to Contractor within twenty-one (21) calendar days after all deficiencies to the Contract document that were noted during the Substantial Completion Inspection and listed on the attachment to the Certificate of Substantial Completion have been corrected, and provided the Contract has been fully performed and a final Certificate for Payment has been issued by the Owner. In addition, Contractor shall provide to the Owner a certified statement of Release of Lien (AIA Document G706A or approved form), Consent of Surety, Warranty from Prime Contractor, Warranties from Suppliers and Manufacturers, training sessions, equipment/operating manuals, and as-built drawings.

ARTICLE 8
SCHEDULE

Contractor shall, within five (5) working days after the effective date of Notice to Proceed, prepare and submit five (5) copies of a progress schedule covering project operations for the Contract Period of sixty (60) calendar days for the Work. This progress schedule shall be of the type generally referred to as a Critical Path Method (CPM), Critical Path Schedule (CPS), and Critical Path Analysis (CPA), and other similar designations. The CPM shall be used to control the timing and sequences of the project. All work shall be done in accordance with the CPM Planning and Scheduling. A written statement of explanation shall be submitted with the

progress schedule. All costs incurred by Contractor to implement the CPM shall be borne by Contractor, and are part of their contract.

ARTICLE 9
GENERAL AND SPECIAL PROVISIONS

9.1 This Agreement shall be governed exclusively by the provisions hereof and by the laws of the State of New Mexico as the same from time to time exist.

9.2 Terms used in this agreement which are defined in the Conditions of the Contract shall have the meanings designated in those Conditions.

9.3 Contractor shall defend, indemnify, and hold harmless the Owner against any and all injury, loss, or damage, including, without limitation, cost of defense, court costs and attorney's fees arising out of the acts, errors, or omissions of Contractor.

9.4 An enumeration of Contractor's Liability Insurance requirements appears in the General Conditions of the Contract for construction. Insurance requirements are also described in the Instructions to the Bidder section of the Project Manual. Contractor shall maintain adequate insurance in at least the aggregate maximum amounts which the Owner could be liable under the New Mexico Tort Claims Act and shall provide proof of such insurance coverage to the SFWMA. It is the sole responsibility of Contractor to be in compliance with the law.

9.5 This Agreement shall not become effective until: (1) approved by the SFSWMA signed by all parties required to sign this Agreement.

9.6 Contractor and Contractor's agents and employees are independent contractors performing professional and technical services for the Owner and are not employees of the Owner. Contractor and Contractor's agents and employees shall not accrue leave, retirement, insurance, bonding, use of Owner’s vehicles, or any other benefits afforded to employees of the Owner as a result of this Agreement.

9.7 Contractor shall not subcontract any portion of the services to be performed under this Agreement without the prior written approval of the Owner.

9.8 Contractor shall maintain detailed time records, which indicate the date, time and nature of services rendered. These records shall be subject to inspection by the Owner, the Department of Finance and Administration and the State Auditor. The Owner shall have the right to audit the billing both before and after payment; payment under this Agreement shall not foreclose the right of the Owner to recover excessive illegal payments.

9.9 The terms of this Agreement are contingent upon sufficient appropriations and authorization being made by the Owner for the performance of this Agreement. If sufficient appropriations and authorization are not made by the Owner, this Agreement shall terminate upon written notice being given by the Owner to Contractor. The Owner's decision as to whether sufficient appropriations are available shall be accepted by Contractor and shall be final.

9.10 Contractor warrants that Contractor presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance or services required under this Agreement.

9.11 Contractor hereby warrants that Contractor is in compliance with the Americans with Disabilities Act, 29 CFR 1630.

9.12 Contractor, upon final payment of the amounts due under this Agreement, releases the Owner, the Owner's officers and employees, and SFSWMA from all liabilities and obligations arising from or under this Agreement, including, without limitation, to all damages, losses, costs, liability, and expenses, including, without limitation, to attorney's fees and costs of litigation that Contractor may have.

9.13 Contractor agrees not to purport to bind the Owner to any obligation not assumed herein by the Owner, unless Contractor has express written authority to do so, and then only within the strict limits of that authority.

9.14 Notices. Any and all notices provided for hereunder shall be in writing and shall be deemed delivered, given and received when (i) personally delivered, or (ii) five (5) days after the same are deposited in the United States mail, postage prepaid, registered or certified mail, return receipt requested, addressed to the applicable party at the address indicated below for such party, or at such other address as may be designated by either party in a written notice to the other party.

OWNER: Santa Fe Solid Waste Management Agency
Attn: Mr. Randall Kippenbrock, P.E., Executive Director
149 Wildlife Way
Santa Fe, NM 87506

CONTRACTOR: _____
_____
_____
_____

New Mexico License No._____

9.15 Gender, Singular/Plural. Words of any gender used in this Agreement shall be held and construed to include any other gender, and words in the singular number shall be held to include the plural, unless the context otherwise requires.

9.16 Captions and Section Headings. The captions and section headings contained in this Agreement are for convenience of reference only, and in no way limit, define, or enlarge the terms, scope and conditions of this Agreement.

9.17 This document shall be executed in no less than five (5) counterparts, each of which shall be deemed an original.

9.18 Certificates and Documents Incorporated. All certificates and documentation required by the provisions of the Agreement shall be attached to this Agreement at the time of execution, and are hereby incorporated by reference as though set forth in full in this Agreement to the extent they are consistent with its conditions and terms.

9.19 Separability. If any clause or provision of this Agreement is illegal, invalid or

unenforceable under present or future laws effective during the term of this Agreement, then and in that event, it is the intention of the parties hereto that the remainder of this Agreement shall not be affected thereby.

9.20 Waiver. No provision of this Agreement shall be deemed to have been waived by either party unless such waiver be in writing signed by the party making the waiver and addressed to the other party; nor shall any custom or practice which may evolve between the parties in the administration of the terms hereof be construed to waive or lessen the right of either party to insist upon the performance by the other party in strict accordance with the terms hereof. Further, the waiver by any party of breach by the other party of any term, covenant, or condition hereof shall not operate as a waiver of any subsequent breach of the same or any other term, covenant, or condition thereof.

9.21 Entire Agreement. This Agreement represents the entire Contract between the parties and, except as otherwise provided herein, may not be amended, changed, modified, or altered without the written consent of the parties hereto. This Agreement incorporates all of the conditions, agreements, and understandings between the parties concerning the subject matter of this Contract, and all such conditions, understandings, and agreements have been merged into this written Agreement. No prior conditions, agreements, or understandings, verbal or otherwise, of the parties or their agents shall be valid or enforceable unless embodied in this written Agreement.

9.22 Interchangeable Terms. For purposes of all provisions within this Agreement and all attachments hereto, the terms "Agreement" and "Contract" shall have the same meaning and shall be interchangeable.

9.23 Words and Phrases. Words, phrases, and abbreviations which have well-known technical or trade meanings used in the Contract documents shall be used according to such recognized meaning. In the event of a conflict, the more stringent meaning shall govern.

9.24 Relationship of Contract Documents. The Contract Documents are complementary, and any requirement of one contract document shall be as binding as if required by all.

9.25 Pursuant to Section 13-1-191, NMSA 1978, reference is hereby made to the Criminal Laws of New Mexico (including Sections 30-14-1, 30-24-2, and 30-41-1 through 30-41-3, NMSA 1978) which prohibit bribes, kickbacks, and gratuities, the violation of which constitutes a felony. Further, the Procurement Code (Sections 13-1-28 through 13-1-199, NMSA 1978) imposes civil and criminal penalties for its violation.

9.26 By entering into this Agreement, the parties do not intend to create any right, title or interest in or for the benefit of any person other than the Owner and Contractor. No person shall claim any right, title of interest under this Agreement or seek to enforce this Agreement as a third party beneficiary of this Agreement.

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

SANTA FE SOLID WASTE MANAGEMENT AGENCY - JOINT POWERS BOARD

_____
MICHAEL HARRIS
CHAIRPERSON

ATTEST:

_____
YOLANDA Y. VIGIL
SANTA FE CITY CLERK

CONTRACTOR:

_____

APPROVED AS TO FORM:

_____
NANCY R. LONG
SFSWMA ATTORNEY

Section 8
Performance Bond

PERFORMANCE BOND

A. KNOW ALL MEN BY THESE PRESENTS, that_____ _____(here insert the name and address or legal title of Contractor) as Principal, hereinafter called Contractor, and _____ (here insert the legal title of Surety) as Surety, hereinafter called Surety, are held firmly bound unto the Santa Fe Solid Waste Management Agency as Obligee, hereinafter called Owner, in the amount of _____ DOLLARS ($_____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

B. WHEREAS, Contractor has by written agreement dated, _____, 2017, entered into a Contract with the Santa Fe Solid Waste Management for the _____ in accordance with Construction Plans and Specifications prepared by the Owner which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

C. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

1. The Surety hereby waives notice of any alteration or extension of time made by the Owner.
2. Whenever Contractor shall be, and declared by the Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default or shall promptly:
    a. Complete the Contract in accordance with its terms and conditions or
    b. Obtain a bid or bids for submission to Owner for completing the Contract in accordance with its terms and conditions, and upon determination by Owner and Surety of the lowest responsible bidder, arrange for a contract between such bidder and Owner, and make available as work progresses (even though there should be a default or a secession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price, but not exceeding, including other costs and damages for which the surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract price" as used in this paragraph, shall mean the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.
3. Any suit under this bond must be instituted before the expiration of two (2) years

from the date on which final payment under the contract falls due.

4. No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

(SIGNED) _____

TITLE _____

SUBSCRIBED AND SWORN to before me this_____day of_____, 2017.

_____

NOTARY PUBLIC

My Commission Expires_____

_____

CONTRACTOR- PRINCIPAL

By:_____

Title: _____

Approved as to form:

SURETY

Title: _____

Countersigned: _____

Surety's Authorized New Mexico Agent

This Page Intentionally Left Blank

Section 9
Labor and Material Payment Bond

LABOR AND MATERIAL PAYMENT BOND

A. KNOW ALL MEN BY THESE PRESENTS THAT

_____

(HERE INSERT THE NAME AND ADDRESS OR LEGAL TITLE OF CONTRACTOR) as Principal, hereinafter called Principal, and _____

_____

(HERE INSERT THE LEGAL TITLE OF SURETY)
As Surety, hereinafter called Surety, are held and firmly bound unto the Santa Fe Solid Waste Management Agency as Obligee, hereinafter called Owner, for the use and benefits of claimants as herein below defined, in the amount of_____
DOLLARS, ($_____) for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

B. WHEREAS, Principal has by written agreement dated _____, 2017 entered into a contract with the Santa Fe Solid Waste Management Agency for the

_____

in accordance with Construction Plans and Specifications prepared by the Santa Fe Solid Waste Management Agency, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

C. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, than this obligation shall be void; otherwise, it shall remain in full force, subject, however, to the following conditions.

1. A claimant is defined as one having a direct contract with the principal or with a subcontractor of the principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

2. The above-named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for payment of any cost or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:

    a. Unless claimant, or other than one having a direct contract with the principal, shall have written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such said claim is made, stating

with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed.

b. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or revised in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such services need not be made by a public officer.

c. After the expiration of one (1) year following the date on which Principal ceased work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

d. Other than in a state court of competent jurisdiction in and for the Owner or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall not be reduced by and to the extent of any payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

SIGNED AND SEALED on _____ , 2017

In the presence of:

_____
NOTARY PUBLIC

My Commission Expires: _____

_____
NAME OF COMPANY

By:_____

Title: _____

_____
SURETY

By:_____

Title: _____

Countersigned:

_____
Surety's Authorized New Mexico Agent

This bond is issued simultaneously with performance bond in favor of contracting agency for the faithful performance of the contract.

Section 10
General Conditions

NOTICE

This document has been prepared by the staff of the Owner for use in construction projects.

DOCUMENT - SECTION 00710

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

NOTE: THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION.

TABLE OF ARTICLES

ARTICLE 1

CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Owner-Contractor Agreement, the Conditions of the Contract (General, Supplementary, and Other Conditions), the Construction Plans, the Specifications, and all Addenda issued prior to and all Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Engineer pursuant to Subparagraph 2.2.6, or (4) a written order for a minor change in the work issued by the Engineer pursuant to Paragraph 12.4. The Contract Document do not include Bidding Documents such as the Advertisement or Invitation to Bid, the Instructions to Bidders, sample forms, Contractor's bid, or portions of Addenda relating to any of these, or any other documents, unless specifically enumerated in the Owner-Contractor Agreement.

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1. The Contract Documents shall not be construed to create any contractual relationship of any kind between the Engineer and Contractor, but the Engineer shall be entitled to performance of obligations intended for its benefit, and to enforcement thereof. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner or the Engineer and any Subcontractor or Sub-subcontractor.

1.1.3 THE WORK

The Work comprises the design and completed construction required by the Contract Documents, and includes design specifications, and all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

1.1.4 THE PROJECT

The Project is the total design and construction of which the work performed under the Contract Documents may be the whole or a part.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 No fewer than five (5) copies of the Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign the Conditions of the Contract, Construction Plans, Specifications, or any of the other Contract Documents, the Engineer shall identify such Documents.

1.2.2 By executing the Contract, Contractor represents that Contractor has visited the site, familiarized itself with the local conditions under which the work is to be performed, and correlated its observations with the requirements of the Contract Documents.

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being

necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings. In the event of a conflict between the Contract Documents, the more stringent requirements shall govern.

1.2.4 The organization of the Specifications into divisions, sections and articles, and the arrangement of Construction Plans shall not control Contractor in dividing the work among Subcontractors or in establishing the extent of work to be performed by any trade.

1.3 OWNERSHIP AND USE OF DOCUMENTS

1.3.1 All designs, construction plans, technical specifications, notes, and other work developed in the performance of this Contract shall be and remains the sole property of the Owner and may be used on any other work without additional compensation to the Engineer. With respect thereto, the Engineer agrees not to asset any rights and not to establish any claims under the design patent of copyright laws.

ARTICLE 2

ENGINEER/ OWNER

2.1 DEFINITION

2.1.1 The Engineer is the person lawfully licensed to practice Engineering, or an entity lawfully practicing Engineering identified as such in the Owner-Contractor Agreement, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term "Engineer" means the Owner or authorized representative.

2.2 ADMINISTRATION OF THE CONTRACT

2.2.1 The Engineer will provide administration of the Contract as hereinafter described.

2.2.2 The Engineer will be the Owner's representative during construction and until final payment is due. The Engineer will advise and consult with the Owner. The Owner's instructions to Contractor shall be forwarded through the Engineer. The Engineer shall have the authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with Subparagraph 2.2.17.

2.2.3 The Engineer shall submit to the Owner, for approval, a list of critical inspection points based upon the construction schedule furnished by the Contract (Paragraph 4.11.1). The Engineer and its staff (including the on-site representative, if agreed upon) shall make visits to the site at those critical points and at other times as the Engineer deems appropriate during the progress of the work. Additionally, the Engineer shall familiarize itself with the progress and quality of the work and determine if the work is proceeding in accordance with the Contract Documents. On the basis of on-site observations, as an Engineer, it shall guard the Owner against defects and deficiencies in the construction. Should the Engineer determine that any portion of the work varies from the intent of the Contract Documents it shall immediately notify Contractor and the Owner of the non-compliance and the nature of the work required to correct such non-compliance. The Engineer shall recommend to the Owner, in writing, to issue a "stop work order" for any portion of the work that does not substantially comply with the intent of the Contract Documents, except as follows.

2.2.4 The Engineer shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the work. Additionally, the Engineer shall not be responsible for Contractor's failure to carry out the work in accordance with the Contract Documents. The Engineer shall reject work which does not meet or exceed the

standards established by the Contract Documents. Whenever, in Engineer's reasonable opinion, it considers it necessary or advisable to ensure the proper implementation of the intent of the Contract Documents, it will have authority to require special inspection or testing of any work in accordance with the provisions of the Contract Documents whether or not such work be then fabricated, installed or completed.

2.2.5 The Engineer shall at all times have access to the work wherever it is in preparation and progress. Contractor shall provide facilities for such access so the Engineer may perform its functions under the Contract Documents.

2.2.6 Based on the Engineer's observations and an evaluation of Contractor's Application for Payment, the Engineer will determine the amounts owing to Contractor and will issue Certificates for Payment in such amounts, as provided in Paragraph 9.4.

2.2.7 The Engineer will be the interpreter of the requirements of the Contract Documents and the judge of the performance there under by both the Owner and Contractor.

2.2.8 The Engineer will render interpretations necessary for the proper execution or progress of the work, with reasonable promptness and in accordance with any time limit agreed upon. Either party to the Contract may make written request to the Engineer for such interpretations.

2.2.9 Claims, disputes, and other matters in question between Contractor and the Owner relating to the execution or progress of the work or the interpretation of the Contract Documents shall be referred to the Engineer for decision which it will render in writing within a reasonable time.

2.2.10 All interpretations and decisions of the Engineer shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of Construction Plans. In its capacity as interpreter and judge, it will endeavor to secure faithful performance by both the Owner and Contractor, will not show partiality to either, and will not be liable for the result of any interpretation or decision rendered in good faith in such capacity.

2.2.11 The Engineer's decisions in matters relating to artistic effect may be final if consistent with the intent of the Contract Documents.

2.2.12 The Engineer will have authority to reject work which does not conform to the Contract Documents. Whenever, in its opinion, it considers it necessary or advisable for the implementation of the intent of the Contract Documents, it will have authority to require special inspection or testing of the work in accordance with Subparagraph 7.7.2 whether or not such work be fabricated, installed or completed. However, neither the Engineer's authority to act under this Subparagraph 2.2.12, nor any decision made by Engineer in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Engineer to Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the work.

2.2.13 The Engineer will review and approve or take other appropriate action upon Contractor's submittals such as Shop Drawings, Product Data and samples, but only for conformance with the design concept of the work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Engineer's approval of a specific item shall not indicate approval of an assembly of which the time is a component.

2.2.14 The Engineer will prepare Change Orders in accordance will Article 12 and will have authority to order minor changes in the work as provided in Subparagraph 12.4.1.

2.2.15 The Engineer will conduct inspections to determine the dates of Substantial Completion and Final Completion and forward the dates to the Owner for the Owner's review of written warranties and related documents required by the Contract and assembled by Contractor and will issue a final

Certificate of payment upon compliance with the requirements of Paragraph 9.9

2.2.16 If the Owner and Engineer agree, the Engineer will provide one or more Project Representatives to assist the Engineer in carrying out its responsibilities at the site. The duties, responsibilities and limitations of authority of any such Project Representative shall be as set forth in an exhibit to be incorporated in the Contract Documents.

2.2.17 The duties, responsibilities and limitations of authority of the Engineer as the Owner's representative during construction as set for in the Contract Documents will not be modified or extended without written consent of the Owner, Contractor and the Engineer.

2.2.18 In case of the termination of the employment of the Engineer, the Owner shall appoint an Engineer whose status under the Contract Documents shall be that of the former Engineer.

ARTICLE 3

OWNER

3.1 DEFINITION

3.1.1 The Owner is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term "Owner" means the Owner or its authorized representative.

3.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

3.2.1 The Owner shall, at the request of Contractor, at the time of execution of the Owner-Contractor Agreement, furnish to Contractor reasonable evidence that it had made financial arrangements to fulfill its obligations under the Contract. Unless such reasonable evidence is furnished, Contractor is not required to execute the Owner-Contractor Agreement or to commence the work.

3.2.2 The Owner shall furnish all surveys describing the physical characteristics, legal limitation and utility locations for the site for the Project, and a legal description of the site.

3.2.3 Except as provided in Subparagraph 4.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments, and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

3.2.4 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the work.

3.2.5 Unless otherwise provided in the Contract Documents, Contractor will be furnished, free of charge, all copies of Construction Plans and Specifications reasonable necessary for the execution of the work.

3.2.6 The Owner shall forward all instructions to Contractor through the Engineer.

3.2.7 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to work by Owner or by Separate Contractors, Payments and Completion, and Insurance in Articles 6, 9 and 11 respectively.

3.3 OWNER'S RIGHT TO STOP THE WORK

3.3.1 If Contractor fails to correct defective work as required by Paragraph 13.2 or persistently fails to carry out the work in accordance with the Contract Documents, the Owner, by a written order

signed personally or by an agent specifically so empowered by the Owner in writing, may order Contractor to stop the work, or any portion thereof, until the cause of such order has been eliminated; however, this right of the Owner to stop the work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

3.4.1 If Contractor defaults or neglects to carry out the work in accordance with the Contract Documents and fails within seven (7) days after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, after seven (7) days following receipt by Contractor of an additional written notice and without prejudice to any other remedy it may have, make good such deficiencies. In such case, an appropriate Change Order shall be issued deducting from the payments then or thereafter due Contractor the cost of correcting such deficiencies, including compensation for the Engineer additional services made necessary by such default, neglect or failure. Such action by the Owner and the amount charged to Contractor are both subject to the prior approval of the Engineer. If the payments then or thereafter due to Contractor are not sufficient to cover such amount, Contractor shall pay the difference to the Owner.

ARTICLE 4

CONTRACTOR

4.1 DEFINITION

4.1.1 Contractor is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term "Contractor" means Contractor or its authorized representative.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 Contractor shall carefully study and compare the Contract Documents and shall at once report to the Engineer any error, inconsistency or omission it may discover. Contractor shall not be liable to the Owner or the Engineer for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents. Contractor shall perform no portion of the work at any time without Contract Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the work.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 Contractor shall supervise and direct the work, using its best skill and attention. Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the work under the contract.

4.3.2 Contractor shall be responsible to the Owner for the acts and omissions of its employees, Subcontractors and their agents and employees, and other persons performing any of the work under a contract with Contractor.

4.3.3 Contractor shall not be relieved from its obligations to perform the work in accordance with the Contract Documents either by the activities or duties of the Engineer in its administration of the Contract, or by inspections, tests or approvals required or performed under Paragraph 7.8 by persons other than Contractor.

4.4 LABOR AND MATERIALS

4.4.1 Unless otherwise provided in the Contract Documents, Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the work, whether or not incorporated or to be incorporated in the work.

4.4.2 Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ on the work any unfit person or anyone not skilled in the task assigned to Contractor.

4.5 WARRANTY

4.5.1 Contractor warrants to the Owner and Engineer 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 conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Engineer, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions in Paragraph 13.2.

4.5.2 Contractor shall and hereby does warrant and guarantee all workmanship, labor, and materials performed and supplied by Contractor or its Subcontractors for a period of one (1) year from the date of completion as evidenced by the date of the Engineer's Final Certificate of Payment of this Contract. This also included all labor required for replacing materials or equipment found to be defective with the one (1) year period. All guarantees for a longer period of time required by the work sections of these specifications shall be secured by Contractor from Subcontractors and delivered to the Engineer and are hereby warranted by Contractor as much as if countersigned by Contractor.

4.6 TAXES

4.6.1 Contractor shall pay all sales, consumer gross receipts tax, use and other similar taxes for the work or portions thereof provided by Contractor which are legally enacted at the time bids are received, whether or not yet effective.

4.7 PERMITS, FEES AND NOTICES

4.7.1 Unless otherwise provided in the Contract Documents, Contractor shall secure and pay for the building permit and for all other permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the work which are customarily secured after execution of the Contract and which are legally required at the time the bids are received.

4.7.2 Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the work.

4.7.3 It is not the responsibility of Contractor to make certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. If Contractor observes that any of the Contract Documents are at variance therewith in any respect, Contractor shall promptly notify the Engineer in writing, and any necessary changes shall be accomplished by appropriate Modification.

4.7.4 If Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, Contractor shall assume full responsibility therefore and shall in turn notify the Owner's Representative of such action.

4.8 ALLOWANCES

4.8.1 Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by these allowances shall be supplied for such amounts and by these allowances shall be supplied for such amounts and by such persons as the Owner may direct, but Contractor will not be required to employ persons against whom Contractor makes a reasonable objection.

4.8.2 Unless otherwise provided in the Contract Documents:

A. These allowances shall cover the cost to Contractor, less any applicable trade, discount of the materials and equipment required by the allowance delivered at the site, and all applicable taxes;

B. Contractor's costs for unloading and handling on the site, labor, installations costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in this allowance;

C. Whenever the cost is more than or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expenses.

4.9 SUPERINTENDENT

4.9.1 Contractor shall employ a competent Superintendent and necessary assistants who shall be in attendance at the project site during the progress of the work. The Superintendent shall represent Contractor, and all communications given to the Superintendent shall be as binding as if given to Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.

4.10 PROGRESS SCHEDULES

4.10.1 Contractor shall, within five (5) working days after the effective date of Notice to Proceed, furnish five copies of a preliminary progress schedule covering its operations for the first sixty (60) days. The preliminary progress schedule shall be a bar graph or an arrow diagram showing the items Contractor intends to commence and complete the various work stages, operations, and contract means planned to be started during the first sixty (60) days.

4.10.2 Unless otherwise specified in the Special Provisions, Contractor shall submit for approval by the Engineer, within five (5) working days after the effective date of Notice to Proceed, five copies of a critical-path-type analysis. The critical-path-type analysis shall include as a minimum; a graphic network diagram; a computer printout or list of activities; and a brief written explanation of the proposed schedule.

4.10.3 The graphic network diagram shall consist of an arrow diagram or a geometric figure and connector diagram which clearly depicts the major subdivisions of the work, the order and interdependencies of activities planned by Contractor, as well as, activities by others which affect Contractor's planning. The intended time for starting and completing each activity, the associated float time and the quantity and kinds of major equipment to be used shall be shown for each construction operation. For those activities lasting more than thirty (30) days, either the estimated time for 25-50 and 75 percent completion or other significant milestones in the course of the activity, shall be shown. In addition to the actual construction operations, the network diagram shall show such items as submittal of samples and Shop Drawings, delivery of materials and equipment, construction in the area by other forces, traffic detour controls, and other significant items related to the progress of construction. The graphic network diagram shall be printed or neatly and legibly drawn to a linear scale.

4.10.4 Activities shown shall be coordinated insofar as possible with the Contract Bid items, types of work and maximum number of activities of each type.

4.10.5 The computer printout or list of activities shall show for each activity the estimated duration, the earliest starting and finishing dates, the latest starting and finishing dates, and float or slack time. Activities which constitute the critical sequence shall be identified showing total job duration equal to the Contract Time.

4.10.6 The written explanation shall contain sufficient information to describe the construction methods to be used and to enable the Engineer to evaluate the schedule and supporting analysis for validity and practicability. If the schedule or written explanation is not accepted by the Owner, Contractor shall resubmit the rejected items within ten (10) days after rejection.

4.10.7 The analysis may employ the use of an electric computer or may consist of a non-computer analysis if the latter is suitable to analyze the number of activities required. The adequacy of the system selected shall be acceptable to the Engineer.

4.10.8 Contractor shall submit to the Engineer monthly progress status reports on dates directed by the Engineer. Such reports shall list those uncompleted activities which have less than thirty (30) days float and which are either in progress or scheduled to be started within the next reporting period. For each of the listed activities, the following shall be shown:

A. Starting date scheduled in last critical-path-analysis.

B. Actual or intended starting date.

C. Revised activity duration, if any.

If the noted starting dates or duration delay the scheduled project completion date, the delay shall be named. Reasons for the delay shall be given with an explanation of Contractor's proposed corrective action. The Contract shall also note each activity completed during the report period.

4.10.9 A revised critical-path-type analysis shall be submitted when one or more of the following conditions occur:

A. When an approved change Order significantly affects the contract completion date, or the sequence of activities.

B. When progress of any critical activity falls significantly behind the scheduled progress.

C. When delay on a non-critical activity is of such magnitude as to change the course of the critical path.

D. At any time Contractor elects to change any sequence of activities affecting the critical path.

The revised analysis shall be made in the same form and detail as the original submittal and shall be accompanied by an explanation of the reasons for the revisions.

4.10.10 Contractor shall prosecute the work in accordance with the latest critical path type analysis. Deviations therefrom shall be submitted to the Engineer for review. In the event that the progress of items along the critical path is delayed, Contractor shall revise its planning to include additional forces, equipment, shifts or hours necessary to meet the contract completion date. All additional cost resulting therefrom will not be borne by the Owner.

4.11 DOCUMENTS AND SAMPLES AT THE SITE

4.11.1 Contractor shall maintain at the site, for the Owner, one record copy of all Construction Plans, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be available to the Owner upon completion of the work.

4.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

4.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the work by Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the work.

4.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by Contractor to illustrate a material, product or system for some portion of the work.

4.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work will be judged.

4.12.4 Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the work or in the work of the Owner of any separate Contractor, all Shop Drawings, Product Data and Sample required by the Contract Documents.

4.12.5 By approving and submitting Shop Drawings, Product Data and Samples, Contractor represents that it has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that it has checked and coordinated the information contained within such submittals with the requirements of the work and of the Contract Documents.

4.12.6 Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Engineer's approval of Shop Drawings, Product Data or Samples under Subparagraph 2.2.13 unless Contractor has specifically informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation. Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Engineer approval thereof.

4.12.7 Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Engineer on previous submittals.

4.12.8 No portion of the work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Engineer as provided in Subparagraph 2.2.13. All such portions of the work shall be in accordance with approved submittals.

4.13 USE OF SITE

4.13.1 Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not reasonably encumber the site with any materials or equipment.

4.13.2 Contractor shall hold and save the Owner free and harmless from liability of any nature or kind arising from use, trespass or damage occasioned by third persons.

4.14 CUTTING AND PATCHING OF WORK

4.14.1 Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the work or to make its several parts fit together properly.

4.14.2 Contractor shall not damage or endanger any portion of the work or the work of the Owner or any separate contracts by cutting, patching or otherwise altering any work, or by excavation. Contractor shall not cut or otherwise alter the work of the Owner or any separate Contractor except with the written consent of the Owner and of such separate Contractor. Contractor shall not unreasonably withhold from the Owner any separate Contractor its consent to cutting or otherwise altering the work.

4.15 CLEANING UP

4.15.1 Contractor at all times shall keep the premises free from accumulation of waste materials (e.g., liner materials and pipe), trash or debris caused by its operations. At the completion of the work, Contractor shall remove all its waste materials, trash and debris from and about the Project as well as all its tools, construction equipment, machinery and surplus materials.

4.15.2 If Contractor fails to clean up a the completion of the work, the Owner may do so as provided in Paragraph 3.4, and the cost thereof shall be charged to Contractor.

4.15.3 Contractor shall be solely responsible for performance of the following clean up as they apply:

A. Debris: Regardless of the nature of the debris, it shall be immediately cleared from the work area. Each trade shall cooperate with other trades in the removal of debris and in keeping a clean job throughout.

4.16 COMMUNICATIONS

4.16.1 Contractor shall forward all communications to the Owner through the Engineer.

4.17 ROYALTIES AND PATENTS

4.17.1 Contractor shall pay all royalties and license fees. Contractor shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified; but if Contractor has reason to believe that the design, process or product specified is an infringement of a patent, Contractor shall be responsible for such loss unless it promptly gives such information to the Engineer.

4.18 INDEMNIFICATION

4.18.1 To the fullest extent permitted by law, Contractor shall indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself), including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission on Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts an of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such negligent shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnify which would otherwise exist as to any party or person described in this Paragraph 4.18.

4.18.2 In any and all claims against the Owner or the Engineer or any of their agents or employees by an employee of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph 4.18 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any Subcontractor under

workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

4.18.3 The obligation of Contractor under this Paragraph 4.18 shall not extend to the liability of the Engineer, its agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, or (2) the giving of or the failure to give directions by the Engineer, its agents or employees, provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 5

SUBCONTRACTOR

5.1 DEFINITION

5.1.1 A Subcontractor is a person or entity who has a direct contract with Contractor to perform any of the work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or its authorized representative. The term "Subcontractor" does not include any separate Contractor or its Subcontractors.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the work at the Site.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise required by the Contract Documents of the Bidding Documents, Contractor, as soon as practicable after the award of the Contract, shall furnish to the Owner and the Engineer in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the work. The Engineer will promptly reply to Contractor in writing stating whether or not the Owner or the Engineer, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or the Engineer to reply promptly shall constitute notice of no reasonable objection.

5.2.2 Contractor shall not contract with any such proposed person or entity to whom the Owner or the Engineer has made reasonable objection under the provisions of Subparagraph 5.2.1. Contractor shall not be required to contract with anyone to whom it has a reasonable objection.

5.3 SUBCONTRACTUAL RELATION

5.3.1 By an appropriate written agreement, Contractor shall require each Subcontractor, to the extent of the work to be performed by the Subcontractor, to be bound to Contractor by the terms of the Contract Documents, and to assume toward Contractor all the obligations and responsibilities which Contractor, by these Documents, assumes toward the Owner and the Engineer. Said agreement shall preserve and protect the rights of the Owner and the Engineer under the Contract Documents with respect to the work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in Contractor-Subcontractor agreement, the benefit of all rights, remedies and redress against Contractor that Contractor, by these Documents, has against the Owner. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with its Sub-subcontractors. Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 5.3, and identify the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to its

Subcontractors.

ARTICLE 6

WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform work related to the Project with its own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract. If Contractor claims that delay or additional cost is involved because of such action by the Owner, it shall make such claim as provided elsewhere in the Contract Documents.

6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term "Contractor" in the Contract Documents in each case shall mean Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 The Owner will provide for the coordination of the work of its own forces and of each separate Contractor with the work of Contractor, who shall cooperate therewith as provided in paragraph 6.2.

6.2 MUTUAL RESPONSIBILITY

6.2.1 Contractor shall afford the Owner and the Separate Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate its work with theirs as required by the Contract Documents.

6.2.2 If any part of Contractor's work depends for proper execution or results upon the work of the Owner or any separate Contractor, Contractor shall, prior to proceeding with the work, promptly report to the Engineer any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of Contractor so to report shall constitute an acceptance of the Owner's or the separate Contractor's work as fit and proper to receive its work, except as to defects which may subsequently become apparent in such work by others.

6.2.3 Any costs caused by defective or ill-timed work shall be borne by the party responsible thereof.

6.2.4 Should Contractor wrongfully cause damage to the work or property of the Owner or to other work on the site, Contractor shall promptly remedy such damage as provided in Subparagraph 10.2.5.

6.2.5 Should Contractor wrongfully cause damage to the work or property of any separate Contractor, Contractor shall upon due notice promptly attempt to settle with such other Contractor by agreement, or otherwise to resolve the dispute. If such separate Contractor sues or initiates an arbitration proceeding against the Owner on account of any damage alleged to have been cause by Contractor, the Owner shall notify Contractor, who shall defend such proceedings at the Owner's expense, and if any judgment or award against the Owner arises therefrom, Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court or arbitration costs which the Owner has incurred.

6.3 OWNER'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises between Contractors and separate Contractors as to their responsibility for cleaning up as required by Paragraph 4.15, the Owner may clean up and charge the cost thereof to Contractors responsible therefor as the Engineer shall determine to be just.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 The Contract shall be governed by the law of the State of New Mexico.

7.1.2 The Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements, and obligations contained in the Contract Documents. Neither part to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall Contractor assign any moneys due or to become due to Contractor thereunder, without the previous written consent of the Owner.

7.2 WRITTEN NOTICE

7.2.1 Written notice shall be deemed to have dully served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to it who gives the notice.

7.3 CLAIMS FOR DAMAGES

7.3.1 Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party or of any of its employees, agents or others for whose acts it is legally liable, claim shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

7.4 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.4.1 Contractor to whom the Contract is awarded shall furnish and pay for reputable and approved Performance and Labor and Material Payment Bonds, each for the full amount of the Contract Sum. Bonds shall be executed on standard AIA forms.

7.5 RIGHTS AND REMEDIES

7.5.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

7.5.2 No action or failure to act by the Owner, the Engineer, or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

7.6 TESTS

7.6.1 If the Contract Document, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the work to be inspected, tested or approved, Contractor shall give the Engineer timely notice of its readiness so the Engineer may observe such inspection, testing or approval. Contractor shall bear all costs of such inspections, tests or approvals. Tests specifically called for by specifications shall be made by a professional testing laboratory acceptable to the Engineer, and Contractor shall employ same and pay all charges in connection

therewith. Records of tests shall be delivered to the Engineer in duplicate on acceptable forms.

7.6.2 If the Engineer determines that any work requires special inspection, testing, or approval which Subparagraph 7.6.1 does not include, it will, upon written authorization from the Owner, instruct Contractor to order such special inspection, testing or approval, and Contractor shall give notice as provided in Subparagraph 7.6.1. If such special inspection or testing reveals a failure of the work to comply with the requirements of the Contract Documents, Contractor shall bear all costs thereof, including compensation for the Engineer's additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.

7.7 INTEREST

7.7.1 The Owner will not pay interest on payments due and unpaid under the Contract Document.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Substantial Completion of the work as defined in Subparagraph 8.1.3, including authorized adjustments thereto.

8.1.2 The date of commencement of the work is the date established in a Notice to Proceed. If there is no Notice to Proceed, it shall be the date of the Owner-Contractor Agreement or such other date as may be established therein.

8.1.3 The Date of Substantial Completion of the work or designated portion thereof is the Date certified by the Engineer and approved by the Owner when construction is deficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the work or designated portion thereof for the use for which it is intended.

8.1.4 The term "day" as used in the Contract Document shall mean calendar day unless otherwise specifically designated.

8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are the essence of the Contract.

8.2.2 Contractor shall begin the work on the date of commencement as defined in Subparagraph

8.2.3 Contractor shall carry the work forward expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If Contractor is delayed at any time in the progress of the work by any act or neglect of the Owner or the Engineer or by any employees of either, or by any separate Contractor employed by the Owner or by changes ordered in the work, or by labor disputes, fire, unusual delay in unavoidable casualties, or any causes beyond Contractor's control or by delay authorized by the Owner pending arbitration, or by any other cause which the Engineer determines may justify the delay, then the Contract Time shall be extended by Change Order for such reasonable time as the

Engineer may determine.

8.3.2 Any claim for extension of time shall be made in writing to the Engineer not more than twenty (20) days after the commencement of the delay; otherwise it shall be waived. In the case of a continuing delay, only one claim is necessary. Contractor shall provide an estimate of the probable effect of such delay on the progress of the work.

8.3.3 If written agreement is made stating the dates upon which interpretations as provided in Subparagraph 2.28 shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen (15) days after written request is made for them, and not then unless such claim is reasonable.

8.3.4 This Paragraph 8.3 does not exclude the recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and including authorized adjustments thereto, is the total amount payable by the Owner to Contractor for the performance of the work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, Contractor shall submit to the Engineer a schedule of values allocated to the various portion of the work, prepared in such form and supported by such data to substantiate its accuracy as the Engineer may require. This schedule, unless objected to by the Engineer, shall be used only as a basis for Contractor's Applications for payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 At least ten (10) days before the date for each progress payment established in the Owner-Contractor Agreement, Contractor shall submit to the Engineer an itemized Application for Payment, notarized if required, supported by such data substantiating Contractor's right to payment.

9.3.2 Unless otherwise provided in the Contract Documents, payments will be made on account of materials or equipment not incorporated in the work but delivered and suitably stored at the site; and, if approved in advance by the Owner payments may similarly be made for materials or equipment suitably stored at some other location agreed upon in writing. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance and transportation to the site for those materials and equipment stored off the site.

9.3.3 Contractor warrants that title to all work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by Contractor, whichever occurs first, free and clear of all liens, claims, security interest or encumbrances hereinafter referred to in this Article 9 as "liens"; and that no work, materials or equipment covered by an Application for Payment will have been acquired by Contractor, or by any other person performing work at the site or furnishing materials or equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by Contractor or such other person.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 The Engineer will within seven (7) days after the receipt of the Contract's Application for Payment, either issue a Certificate for Payment to the Owner with a copy to Contractor for such amount as the Engineer determines is properly due, or notify Contractor in writing of its reasons for withholding a Certificate as provided in Subparagraph 9.6.1.

9.4.2 The issuance of Certificate for Payment will constitute a representation by the Engineer to the Owner, based on its observations at the site as provided in Subparagraph 2.2.3 and the data comprising the Application for Payment, that the work has progressed to the point indicated; that, to the best of its knowledge, information and belief, the quality of the work is in accordance with the Contract Documents (subject to an evaluation of the work for conformance with the Contract Documents upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents correctable prior to completion, and to any specific qualifications stated in its Certificate); and that Contractor is entitled to payment in the amount certified. However, by issuing a Certificate for Payment, the Engineer shall not thereby be deemed to represent that it has made exhaustive or continuous on-site inspections to check the quality or quantity of the work or that it has reviewed the construction means, methods, techniques, sequences or procedures, or that it has made any examination to ascertain how or for what purpose Contractor has used the moneys previously paid on account of the Contract Sum.

9.5 PROGRESS PAYMENTS

9.5.1 After the Engineer has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents.

9.5.2 Contractor shall promptly pay each Subcontractor upon receipt of payment from the Owner, out of the amount paid to Contractor on account of such Subcontractor's work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to Contractor on account of such Subcontractor's work. Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payment to its Subcontractors in similar manner.

9.5.3 The Engineer may, on request and at its discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by Contractor on the action taken thereon by the Engineer on account of work done by such Subcontractor.

9.5.4 Neither the Owner nor the Engineer shall have any obligation to pay or to see to the payment of any monies to any Subcontractor except as may otherwise be required by law.

9.5.5 No Certificate for progress payment, no progress payment, nor any partial or entire use of occupancy of the Project by the Owner shall constitute an acceptance of any work not in accordance with the Contract Documents.

9.6 PAYMENT WITHHELD

9.6.1 The Engineer may decline to certify payment and may withhold its Certificate in whole or in part, to the extent necessary to reasonably protect the Owner, if in its opinion it is unable to make representations to the Owner as provided in Subparagraph 9.4.2.

9.6.2 If the Engineer is unable to make representations to the Owner, as provided in Subparagraph 9.4.2 and to certify payment in the amount of the Application, it will notify Contractor as provided in Subparagraph 9.4.1. If Contractor and Engineer cannot agree on a revised amount, the Engineer will promptly issue a Certificate for Payment for the amount for which it is able to make such

representations to the Owner. The Engineer may also decline to certify payment, or because of subsequently discovered evidence or subsequent observations, it may nullify the whole or any part of any Certificate for Payment previously issued, to such extent as may be necessary in its opinion to protect the Owner from loss because of:

A. Defective work not remedied;

B. Third party claims filed or reasonable evidence indicating probable filing of such claims;

C. Failure of Contractor or make payments properly to Subcontractors or for labor, materials or equipment;

D. Reasonable evidence that the work cannot be completed for the unpaid balance of the Contract Sum;

E. Damage to the work of another Contractor;

F. Reasonable evidence that the work will not be completed within the Contract Time; or,

G. Failure to carry out the work in accordance with the Contract Documents.

9.6.2 When the above grounds in Subparagraph 9.6.1 removed, payment shall be made for amounts withheld because of them.

9.7 FAILURE OF PAYMENT

9.7.1 If the Engineer does not issue a Certificate for Payment, through no fault of Contractor, within seven (7) days after receipt of Contractor's Application for Payment, or if the Owner does not pay Contractor within seven (7) days after the date established in the Contract Documents any amount certified by the Engineer, then Contractor may, upon seven (7) additional days' written notice to the Owner and the Engineer, stop the work until payment of the amount owing has been received. The Contract Sum shall be increased by the amount of Contractor's reasonable costs of shut-down, delay and start-up, which shall be effected by appropriate Change Order in accordance with Paragraph 12.3.

9.8 SUBSTANTIAL COMPLETION

9.8.1 When Contractor considers that the work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Subparagraph 8.1.3, Contractor shall prepare for submission to the Engineer a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of Contractor to complete all work in accordance with the Contract Documents. When the Engineer, with the Owner, on the basis of an inspection determines that the work or designated portion thereof is substantially complete, Contractor will then prepare a Certificate of Substantial Completion Form, AIA Document G704-1978, which shall establish the Date of Substantial Completion, shall state the responsibilities of the Owner and Contractor for security, maintenance within which Contractor shall complete the items listed therein. Warranties required by the Contract Document shall commence on the date of Final Completion of the work or designated portion there of unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to Contractor and the Owner for their written acceptance of the responsibilities assigned to them in such Certificate.

9.8.2 Upon Substantial Completion of the work or designated portion thereof and upon application by Contractor and certification by the Engineer, the Owner shall make payment, reflecting adjustment in retainage, if any, for such work or portion thereof, as provided in the Contract Documents.

9.9 FINAL COMPLETION AND FINAL PAYMENT

9.9.1 Upon receipt of written notice that the work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Engineer will promptly make such inspection and, if Engineer finds the work acceptable under the Contract Documents and the Contract fully performed, Engineer will promptly issue final Certificate for Payment stating that, to the best of its observations and inspections, the work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due Contractor and noted in said Final Certificate, is due and payable. The Engineer's Final Certificate of payment will constitute a further representation that the conditions precedent to Contractor's being entitled to final payment as set forth in Subparagraph 9.9.2 have been fulfilled.

9.9.2 Neither the final payment nor the remaining retained percentage shall become due until Contractor submits to the Engineer (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the Owner or its property might in any way be responsible have been paid or otherwise satisfied, (2) consent of surety, if any, to final payment, and (3) if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of liens arising out of the Contract, to the extent and in such form as may be designed by the Owner. If any Subcontractor refuses to furnish a release or waiver required by the Owner Contractor may furnish a bond satisfactory to the Owner to indemnify itself against any such lien. If any such lien remains unsatisfied after all payments are made, Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

9.9.3 If, after Substantial Completion of the work, final completion thereof is materially delayed through no fault of Contractor or by the issuance of Change Orders affecting final completion, and the Engineer so confirms, the Owner shall, upon application by Contractor and certification by the Engineer and without terminating the Contract, make payment of the balance for that portion of the work fully completed and accepted. If the remaining balance for work not fully completed or corrected is less than the retainage stipulated in the Contract Document, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the payment of the balance due for that portion of the work fully completed and accepted shall be submitted by Contractor to the Engineer prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.9.4 The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

A. Unsettled liens;

B. Faulty or defective work appearing after Substantial Completion;

C. Failure of the work to comply with the requirements of the Contract Documents; and

D. Terms of any special warranties required by the Contract Documents.

9.9.5 The acceptance of final payment shall constitute a waiver of all claims by Contractor except those previously made in writing and identified by Contractor as unsettled at the time of the final Application for Payment.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 Contractor shall be responsible in initiating, maintaining and supervising all safety precautions and programs in connection with the work.

10.2. SAFETY OF PERSONS AND PROPERTY

10.2.1 Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

A. All employees on the work and all other persons who may be affected thereby;

B. All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of Contractor or any of its Subcontractors or Sub-subcontractors; and

C. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities no designated for removal, relocation or replacement in the course of construction.

10.2.2 Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

10.2.3 Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Owners and users of adjacent utilities.

10.2.4 When the use of storage of explosives or other hazardous materials or equipment is necessary for the execution of the work, Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 Contractor shall promptly remedy all damage or loss (other than damage of loss insured under paragraph 11.3) to any property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by Contractor, any Subcontractor or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which Contractor is responsible under clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to the acts or omissions of the Owner or the Engineer or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and no attributable to the fault or negligence of Contractor. The foregoing obligations of Contractor are in addition to its obligations under Paragraph 4.18.

10.2.6 Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be Contractor's Superintendent unless otherwise designated by Contractor in writing to the Owner and the Engineer.

10.2.7 Contractor shall not load or permit any part of the work to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, Contractor shall act, at its reasonable

discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by Contractor on account of emergency work shall; be determined as provided in Article 12 for Changes in the work.

ARTICLE 11

INSURANCE

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 Contractor shall maintain in effect, and shall require all Subcontractors and others performing any portion of this Contract to maintain if effect, insurance of the types and respective minimum limits set for in Article 11. Such insurance shall cover all operations under this Contract. Maintenance of such insurance in at least the specified minimum amounts shall not relieve Contractor or liability for loss in excess of the limits of liability specified herein or otherwise not covered by the coverage's required herein. Contractor shall bear the cost of such insurance and include its costs in the bid. The following limits of insurance shall be maintained, unless otherwise listed in the Certificate of Insurance.

Type of Required Coverage	**Minimum Limits of Liability**
Workman's Compensation - including accident and occupational disease coverage. Statutory Employer's Liability	Carry such insurance as it deems necessary to protect it from all claims under any workman's compensation law in effect that may be applicable to Contractor.
Comprehensive General Liability - including endorsements providing broad form property damage coverage, personal injury coverage, and contractual assumption of liability coverage for all liability Contractor has assumed under its Contract.	With limits of coverage in the maximum amount which the Owner could be held liable under the New Mexico Tort Claims Act for each person injured and for each accident resulting in damage to property.
Auto Liability - including non-owned auto coverage.	Same limits as General Liability.

11.1.2 Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the work. These Certificates shall contain a provision that coverage afforded under the policies will not be canceled until at least thirty (30) days; prior written notice has been given to the Owner. Contractor shall furnish one (1) copy of each of the Certificates of insurance herein required for each copy of the contract.

11.2 OWNER'S LIABILITY INSURANCE

11.2.1 The Owner shall be responsible for purchasing and maintaining its own liability insurance and, at its option, may purchase and maintain such insurance as will protect itself against all claims which may arise from operations under the Contract.

11.3 PROPERTY INSURANCE

11.3.1 Contractor shall maintain builder's risk property insurance or self insurance, or a combination of insurance and self insurance, upon the work at the site for at least the actual cash value thereof. The builder's risk insurance shall cover the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the work. The insurance shall insure against at least the following perils: fire extended coverage, vandalism, and malicious mischief. Contractor shall bear the cost of such insurance and include its cost in the bid.

11.3.2 Any loss insured or self insured under Subparagraph 11.3.1 is to be adjusted with the Owner and

made payable to the Owner as trustee for the insured, as their interests may appear subject to the requirements of any applicable mortgage clause. The Owner shall deposit the proceeds in a separate account and shall distribute them in accordance with such agreement as the parties in interest, including the Owner, may reach. Contractor shall pay each Subcontractor a just share of any insurance proceeds which Contractor receives and shall require by written agreement signed by the Subcontractor that the Subcontractor will make payments to its Sub-subcontractors in a similar manner. If after such loss no other special agreement is made, replacement of damaged work shall be covered by an appropriate order.

11.3.3 To the extent permitted under their respective property insurance policies, the Owner and Contractor hereby waive all rights, each against the other, for damages caused by fire or other perils to the extent covered by Insurance obtained pursuant to this Article 11 or any other property insurance applicable to the work, except such rights as they may have to the proceeds of such Insurance held by the Owner as trustee. The Owner or Contractor, as appropriate, shall require the Engineer, other Contractors, Subcontractors, and Sub-subcontractors to similarly waive rights of subrogation or property insurers.

11.3.4 If the Owner finds it necessary to occupy use of any portion of the work prior to Substantial Completion, such occupancy or use shall not commence prior to the time mutually agreed to by the Owner and Contractor and, if required by the applicable insurance or self insurance coverage not prior to the time the builder's risk property insurer has consented to such occupancy or use. Contractor's consent to such occupancy or use shall not be unreasonably withheld.

11.4 LOSS OF USE INSURANCE

11.4.1 The Owner, at its option, may purchase and maintain such insurance as will insure itself against loss of use of its property due to fire or other hazards, however caused.

ARTICLE 12

CHANGES IN THE WORK

12.1 CHANGE ORDERS

12.1.1 A Change Order is a written order to Contractor signed by the Engineer and Contractor and approved in writing by the Owner. A Change Order may be issued only after the execution of the Contract and shall be the only means used to order changes in the work for which Contractor requires additional compensation, changes to the Contract Time, or changes to the Contract Sum. Minor changes in the work for which Contractor requires no additional compensation or time shall be executed in accordance with the provision of Subparagraph 12.4.1.

12.1.2 The Owner, without invalidating the Contract, may order changes in the work within the general scope of Contractor consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the work shall be authorized by Change Order and shall be performed under the applicable conditions of the Contract Documents.

12.1.3 The cost or credit to the Owner resulting from a change in the work shall be determined in one or more of the following ways:

A. By mutual acceptance of a lump sum properly itemized an supported by sufficient substantiating data to permit evaluation;

B. By unit prices stated in the Contract Documents or subsequently agreed upon;

C. By cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

D. By the method provided in Subparagraph 12.1.4.

12.1.4 If none of the methods set forth in Clauses 12.1.2., 12.1.3. or 12.1.3. is agreed upon, Contractor, provided Contractor receives a written order signed by the Owner, shall promptly proceed with the work involved. The cost of such work shall the be determined by the Engineer on the basis of the reasonable expenditures and savings of those performing the work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, Contractor shall keep and present, in such form as the Engineer may prescribe, an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following: cost of materials, including sales tax and cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits, required by agreement or custom, workers' or workmen's compensation insurance; bond premiums; rental value of equipment and machinery; and the additional costs of supervision and field office personnel directly attributable to the change. Pending final determination of cost to the Owner payments on account shall be made on the Engineer's Certificate for payment. The amount of credit to be allowed by Contractor to the Owner for any deletion or change which results in a net decrease in the Contract Sum will be the amount of the actual net cost as confirmed by the Engineer. When both additions and credits covering related work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to that change.

12.1.5 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed unit prices to the quantities of work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

12.1.6 By submission of a bid, Contractor agrees and binds itself to the following method of calculating Change Order costs. The Owner also agrees to the following method of calculating the cost of any changes to the Contract. With each proposal for a change in the amount of the Contract, Contractor shall submit an itemized breakdown of all increases or decreases in the cost of Contractor's and all Subcontractor's and Sub-subcontractor's work to include at least the following detail in the general order listed:

A. Material quantities and unit costs;

B. Labor amounts and hourly rates (identified with specific items of material to be placed or operation to be performed);

C. Costs inherent in use of Contractor/Sub-subcontractor owned equipment;

D. Equipment rental, if any;

E. Workmen's compensation and public liability insurance;

F. General administration, overhead, supervision, project insurance and profit, based on the following schedule:

Subtotal before Applying the Percentage Shown	**$500 & Less**	**Over $500**
Contractor for work performed by its own forces	22%	19%
Contractor for work performed by Subcontractor	10%	8%
Subcontractor for work performed by its own forces	18%	15%

Subcontractor for work performed by Sub-subcontractor	10%	8%
Sub-subcontractor for work performed by its own forces	18%	15%

G. Employment taxes under FICA and FUTA; and

H. State gross receipts tax (Contractor only).

12.1.7 The quotation for work under a Change Order shall be binding for sixty (60) days from the date submitted by Contractor.

12.2 CONCEALED CONDITIONS

12.2.1 Should concealed conditions encountered in the performance of the work below the surface of the ground or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the Contract Documents, or should unknown physical conditions below the surface of the ground or should concealed or unknown conditions in an existing structure of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the Character provided for in this Contract, be encountered, the Contract Sum shall be equitably adjusted by change Order upon verified claim by either party made within twenty (20) days after the first observance of the conditions.

12.2.2 If Contractor wishes to make a claim for an increase in the Contract Sum, Contractor shall give the Engineer written notice thereof within twenty (20) days after the occurrence of the event giving rise to such claim. This notice shall be given by Contractor before proceeding to execute the work, except in an emergency endangering life or property, in which case Contractor shall proceed in accordance with Paragraph 10.3. No such claim shall be valid unless so made. If such claims are justified and the Owner authorizes an increase in the Contract Sum, the Owner and Contractor shall proceed to negotiate the amount of the adjustment in the Contract Sum. If the Owner and Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined by the Engineer. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.2.3 If Contractor claims that additional cost is involved because of, but not limited to, (1) any written interpretation pursuant to Subparagraph 2.2.8, (2) any order by the Owner to stop the work pursuant to Paragraph 3.3 where Contractor was not at fault, (3) any written order for a minor change in the work issued pursuant to Paragraph 12.4, or (4) failure of payment by the Owner pursuant to Paragraph 9.7, Contractor shall make such claims provided in Subparagraph 12.3.1.

12.3 MINOR CHANGES IN THE WORK

12.3.1 The Engineer will 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. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. Contractor shall carry out such written orders promptly.

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the work should be covered contrary to the request of the Engineer or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Engineer, be uncovered for its observation and shall be replaced at Contractor's expense.

13.1.2 If any portion of the work has been covered which the Engineer has not specifically requested to observe prior to begin covered, the Engineer may request to see such work and it shall be uncovered by Contractor. If such work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such work be found not in accordance with the Contract Documents, Contractor shall pay such costs unless it be found that this condition was caused by the Owner or a separate Contractor as provided in Article 6, in which even the Owner shall be responsible for the payment of such costs.

13.2 CORRECTION OF WORK

13.2.1 Contractor shall promptly correct all work rejected by the Engineer as defective or as failing to conform to the Contract Documents whether observed before or after Substantial completion and whether or not fabricated, installed or completed. Contractor shall bear all costs of correcting such rejected work, including compensation for the Engineer's additional services made necessary thereby.

13.2.2 If, within one year after the Date of Substantial Completion of the work or designated portion thereof or within one year after acceptance by the Owner of designated equipment or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the work is found to be defective or not in accordance with the Contract Documents, Contractor shall correct it promptly after receipt of a written notice from the Owner to do so unless the Owner has previously given Contractor a specific written acceptance of such condition. This obligation shall survive termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

13.2.3 Contractor shall remove from the site all portions of the work which are defective or non-conforming and which have not been corrected under Subparagraphs 4.5, 13.2.1 and 13.2.2, unless removal is specifically waived in writing by the Owner.

13.2.4 If Contractor fails to correct defective or non-conforming work as provided in Subparagraph 4.5.1, 13.2.1 and 13.2.2, the Owner may correct it in accordance with Paragraph 3.4.

13.2.5 If Contractor does not proceed with the correction of such defective or non-conforming work within a reasonable time fixed by written notice from the Engineer, the Owner may remove it and may store the materials or equipment at the expense of Contractor. If Contractor does not pay the cost of such removal and storage within ten (10) days thereafter, the Owner may upon ten (10) additional days' written notice sell such work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by Contractor including compensation for the Engineer's additional services made necessary thereby. If such proceeds of sale do not cover all costs which Contractor should have borne, the difference shall be charged to Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to the Owner.

13.2.6 Contractor shall bear the cost of making good all work of the Owner or separate Contractors destroyed or damaged by such correction or removal.

13.2.7 Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time period of one year after the Date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to Contractor to correct the work and has no relationship to the time within which its obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish Contractor's liability with respect to its obligations other than specifically to correct the work.

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

13.3.1 If the Owner prefers to accept defective or non-conforming work, it may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 14

TERMINATION OF THE CONTRACT

14.1 TERMINATION BY CONTRACTOR

14.1.1 If the work is stopped for a period of thirty (30) days under an order of court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of Contractor or a Sub-contractor or their agents or employees or any other persons performing any of the work under a contract with Contractor because the Engineer has not issued a Certificate for payment as provided in Paragraph 9.7 or because the Owner has not made payment thereon as provided in paragraph 9.7, then Contractor may, upon seven (7) additional days' written notice to the Owner and the Engineer, terminate the Contract and recover from the Owner payment for all work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery, including reasonable profit and damages.

14.2 TERMINATION BY THE OWNER

14.2.1 If Contractor is adjudged bankrupt, or if Contractor makes a general assignment for the benefit of its creditors, or if a receiver is appointed on account of its insolvency, or if Contractor persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if Contractor fails to make prompt payment to Subcontractors for material of labor, or persistently disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the Owner, upon certification by the Engineer that sufficient cause exists to justify such action, may without prejudice to any right or remedy and after giving Contractor and its surety, if any, seven (7) days written notice, terminate the employment of Contractor and take possession of the site and of all material, tools, construction equipment and machinery thereon owned by Contractor and may finish the work by whatever method Contractor may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the work is finished.

14.2.2 If the unpaid balance of the Contract Sum exceeds the costs of finishing the work, including compensation for the Engineer's additional services made necessary thereby, and any damages sustained by the Owner as a result of Contractor's breach, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to the Owner. The amount to be paid to Contractor or to the Owner, as the case may be, shall be certified by the Engineer upon application, in the manner provided in paragraph 9.4 and this obligation or to the Owner, as the case may be, shall be certified by the Engineer upon application, in the manner provided in Paragraph 9.4 and this obligation for payment shall survive the termination of the Contract.

14.2.3 In the event that the Project is abandoned by the Owner, the Owner may terminate this contract at any time by giving at least five (5) working days' notice to Contractor. In the event of termination, all work completed shall become the property of the Owner. Contractor shall be entitled to receive compensation for actual work satisfactorily completed hereunder, including reimbursable expense authorized by the Owner, which is then due.

14.2.4 In the event Contractor fails to perform the work in accordance with the Contract Documents, the Owner may terminate the Contract after giving Contractor five (5) working days notice.

ARTICLE 15

EQUAL OPPORTUNITY

15.1 Contractor shall maintain policies of employment as follows:

15.1.1 Contractor, all Subcontractors, and all Sub-subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. Contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to post in conspicuous place, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

15.1.2 The Contract, all Subcontractors, and all Sub-subcontractors shall, in all solicitation or advertisements for employees placed by them or on their behalf, state that all qualified applicant will receive consideration for employment without regard to race, religion, color, sex, or national origin.

ARTICLE 16

MINIMUM WAGE RATES / REGISTRATION

16.1 Contractor warrants and agrees that Contractor and all Subcontractors and Sub-subcontractors shall comply with all applicable provisions of the New Mexico Public Works Minimum Wage Act as outlined in the Contract Documents. Wage rates are not applicable to projects costing less than $60,000.00.

16.2 A General Contractor or subcontractor that submits a bid valued at more than fifty thousand dollars ($50,000) is subject to the Public Works Minimum Wage Act (13-4-10 NMSA 1978) and shall be required to be registered with the Labor and Industrial Division of the NM Labor Department. The Registration Number shall be provided in the spaces provided in the Bid Form and on the Subcontractor's Listing for subcontracts valued at $50,000 or more. After the Bid Opening, the registration numbers will be verified and the bid will be considered unresponsive and disqualified if the registration numbers are not valid and if Contractor or subcontractor cannot provide proof of the required registration. It is the responsibility of Contractor and subcontractors to ensure that the registration is completed prior to the Bid Opening.

Section 11
Supplementary Conditions

SUPPLEMENTARY CONDITIONS
(Section 00800)

Document is intended to be used in conjunction with the General Conditions of the Contract.

ADDITIONAL CONDITIONS

1.0 DEFINITIONS - The following definitions shall apply through the Bidding Documents or Contract Documents unless otherwise specified.

1.1 ADDENDUM: Written or graphic instrument issued prior to the execution of the Contract which modifies or interpret the Bidding Documents, including Construction Plans and Specifications, by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed. Plural: ADDENDA

1.2 ADDITIVE OR DEDUCTIVE ALTERNATE BID: Amount stated in the Bid to be added or deducted from the amount of the Base Bid if the corresponding change in project scope or alternate materials and/or methods of construction is accepted.

1.3 BASE BID: Amount of money stated in the Bid as the sum for which the Bidder offers to perform the work, not including that work for which Alternate Bids are also submitted.

1.4 BID: A complete and properly signed proposal to do the work or designated portion thereof for the sums stipulated therein, supported by data called for by the Bidding Documents.

1.5 BID LOT: A major item of work for which a separate quotation or proposal is requested.

1.6 BIDDER: One who submits a bid for a Prime contract with the Owner, as distinct from a Subcontractor, who submits a bid to a Bidder. Technically, a Bidder is not a Contractor on a specific project until a contract exists between Contractor and the Owner.

1.7 BIDDING DOCUMENT: Documents that include the Invitation for Bid, Instructions to Bidders, the Bid Form, other sample bidding and contract forms, and the proposed Contract Documents, including any Addenda issued prior to receipt of bids. The Contract Documents proposed for the work consist of the Owner-Contractor Agreement, the Conditions of the Construction Contract (General, Supplementary, and Other Conditions), the Construction Plans, the Specifications, and all Addenda issued prior to and all Modifications issued after execution of the Contract.

1.8 DAY: Calendar day, which is every day shown on the calendar, beginning and ending at midnight. However, due to the Work being performed at an active landfill, Contractor will be limited to a workday starting no earlier than 7:00 a.m. and ending no later than 7:00 p.m. (i.e., daylight hours only).

1.9 CENTRAL PURCHASING OFFICE: The Central Purchasing Office is the City of Santa Fe Purchasing Department.

1.10 GOVERNING AUTHORITY: The Joint Powers Board of the execution of construction contracts is the Chairperson or Executive Director.

1.11 INVITATION FOR BID: The Bidding Documents utilized for soliciting sealed bids. "Invitation to Bid" shall have the same meaning as "Advertisement for Bid".

1.12 OWNER: Santa Fe Solid Waste Management Authority, Santa Fe, New Mexico.

1.13 PROCUREMENT OFFICER: The Director of the Purchasing Division, or a designee authorized to enter into or administer contracts and make written determination with respect thereto.

1.14 RESPONSIBLE BIDDER: A Bidder who submits a responsive bid and who has furnished, when required, information and data to prove that its financial resources, production or service facilities, personnel, service reputation, and experience are adequate to make satisfactory delivery of the services, construction, or items of tangible personal property described in the Bidding Documents (13-1-82, NMSA 1978).

1.15 SFSWMA: Santa Fe Solid Waste Management Agency.

1.16 SUCCESSFUL BIDDER: The lowest qualified and responsible Bidder to whom the Owner, on the basis of the Owner's evaluation, makes an award.

1.17 UNIT PRICES: Amounts stated in the Contract as prices per unit of measurement for materials or services as described in the Contract Documents.

1.18 USER: The Santa Fe Solid Waste Management Authority, agencies, or designated entity for whose use the Project is being constructed.

2.0 CONTRACT AUDIT

The Owner shall be entitled to audit the books and records of a Contractor or any Subcontractor under any negotiated contract or subcontract other than a firm fixed-price contract to the extent that such books and records relate to the performance of such contract or subcontract. Such books and records shall be maintained by Contractor for a period of three (3) years from the date of final payment under the prime contract and by the Subcontractor for a period of three (3) years from the date of final payment under the subcontract unless a shorter period is otherwise

authorized in writing.

3.0 DEBARRED OR SUSPENDED CONTRACTORS

A business (Contractor, Subcontractor, or Supplier) that has either been debarred or suspended pursuant to the requirements of the City of Santa Fe Purchasing Manual shall not be permitted to do business with the Owner and shall not be considered for award of contract during the period for which it is debarred or suspended.

4.0 BRIBES, GRATUITIES, AND KICK-BACKS

4.1 It is illegal in the State of New Mexico for any public employee to solicit or accept anything of value in connection with award of this bid and for any person to offer or pay anything of value to any such public employee (30-24-1 through 30-24-2, NMSA 1978).

4.2 Pursuant to Section 13-1-191, NMSA 1978, reference is hereby made to the Criminal Laws of New Mexico (including 30-24-1, 30-23-2, and 30-41-1 through 3-41-3, NMSA 1978), which prohibit bribes, kick-backs, and gratuities and violation of which constitutes a felon. Further, the Procurement Code (13-1-28 through 13-1-199, NMSA 1978), imposes civil and criminal penalties for its violation

5.0 PROTESTS (CITY OF SANTA FE PURCHASING MANUAL)

5.1 Any Contractor who is aggrieved in connection with a procurement may protest to the City of Santa Fe Purchasing Agent and the Owner. The protest should be made in writing within twenty-four (24) hours after the facts or occurrences; giving rise thereto, but in no case, less that within fifteen (15) calendar days after the facts or occurrences giving rise thereto.

5.2 In the event of a timely protest under Section 5.1 the City of Santa Fe Purchasing Agent and the Owner shall not proceed further with the procurement unless the Owner makes a determination that the award of contract is necessary to protect substantial interests of the Owner.

5.3 The City of Santa Fe Purchasing Agent or its designee shall have the authority to take any action reasonably necessary to resolve a protest of an aggrieved Contractor concerning a procurement.

5.4 This authority shall be exercised in accordance with adopted regulations, but shall not include the authority to award money damages or attorneys' fees.

5.5 The City of Santa Fe Purchasing Agent or its designee shall promptly issue a determination relating to the protest. The determination shall:

A State the reasons for the action taken; and,

B Inform the protestant of the right to judicial review of the determination.

5.6 A copy of the determination issued shall be mailed immediately to the protestant.

6.0 CONTRACT BOND REQUIREMENTS

6.1 The Successful Bidder, where the Contract Price exceeds five hundred dollars ($500), shall post a one hundred percent (100%) Performance Bond and a one hundred percent (100%) Labor and Material Payment Bond. Bonds shall be executed on Performance Bond and Labor and Material Payment Bond forms attached hereto, with amount payable conforming to the terms of the contract. Surety shall be a company licensed to do business in the State of New Mexico and acceptable to the Owner.

6.2 Personal sureties may be accepted if the Owner so determines in advance, but in such case the amount of the Bond shall be the full Contract Price, and the sureties shall justify under oath in amounts above liabilities and exemptions aggregating double the amount of the Bond.

6.3 Special attention of Bidders is called to the requirements of Section 13-4-18 through 13-4-20, NMSA 1978 regarding a Contractor who does not have its principal place of business in the State of New Mexico for all taxes due arising out of construction services rendered under the Contract.

6.3.1 The right to sue on this Bond accrues only to the Owner and the parties to whom Sections 13-4-18 through 13-4-20, NMSA 1978 grant such right; and any such right shall be exercised only in accordance with the provisions and limitations of said statues.

7.0 NON-RESIDENT CONTRACTOR'S REQUIREMENTS REGARDING GROSS RECEIPTS TAX SURETY BOND

7.1 Section 7-1-55A, NMSA 1978 provides that any person (as defined in Section 7-1-3, NMSA 1978) engaged in the construction business who does not have its principal place of business in New Mexico and enters into a prime construction contract to be performed in this State shall, at the time such contract is entered into, furnish the Director of the Revenue Division, Taxation and Revenue Department, or its delegate with a surety bond or other acceptable security in a sum equivalent to the gross receipts to be paid under the contract multiplied by the applicable rate of the gross receipts tax imposed by Section 7-9-4, NMSA 1978 to secure payment of the tax imposed on the gross receipts from the contract, and shall obtain a certificate form the Director of the Revenue Division, Taxation and Revenue Department, or its delegate that the requirements of this paragraph have been met.

7.2 If the total sum to be paid under the contract is changed by ten percent or more after the date the surety bond or other acceptable security is furnished, to the Director or its delegate, such person shall increase or decrease, as the case may be, the amount of the bond or security within fourteen (14) days after the change (7-1-55B, NMSA 1978).

7.3 In addition to the above requirements, Contractor will be subject to all the requirements of the City Procurement Code.

8.0 CONTRACTOR'S GROSS RECEIPTS TAX REGISTRATION

8.1 Section 7-10-4, NMSA 1978 provides that any person (as defined in Section 7-10-3, NMSA 1978) performing services for the Owner, as those terms are used in the Gross Receipts and Compensating Tax Act (Section 7-10-1 to 7-10-5, NMSA 1978), must be registered and be issued an identification number with the Revenue Division of the Taxation and Revenue Department to pay the gross receipts tax.

8.2 The identification number is needed to properly complete the approval process of the contract; therefor, so as to cause no delay in the processing, Contractor must register with the State of New Mexico, Taxation and Revenue Department. For information contact:

Revenue Division
Taxation and Revenue Department
Manual Lujan Building
1200 St. Francis Drive
Santa Fe, New Mexico 87503
(505) 988-2290

8.3 If any person who performs services for the Owner is not registered to pay the gross receipts tax, the Owner shall withhold payment of the amount due until the person has presented evidence of registration with the Revenue Department to pay the gross receipts tax.

9.0 CONTRACT WITH NONRESIDENT PERSON OR PARTNERSHIPS OR UNADMITTED FOREIGN CORPORATIONS; AGENT FOR SERVICE OF PROCESS

9.1 Special attention of Bidders is called to requirements of Sections 13-4-21 through 13-4-24, NMSA 1978, whereby a public works contract with a nonresident person or partnership or foreign corporation not authorized to do business in the State shall contain a specific provision designating an agent resident within the State, and its address, upon whom process and writs in any action or proceeding against such business may be served in any action arising out of such contract.

10.0 STATE ALLOWANCES

10.1 Contractor shall purchase the "Allowed Materials" as directed by the Owner through the Engineer on the basis of the lowest and the best bid of at least three competitive bids. If the actual price for purchasing the "Allowed materials" is more or less than the "Cash Allowance," the Contract Price shall be adjusted accordingly. The adjustment in Contract Price made on the basis of the purchase price without additional charges for overhead, profit, insurance, or any other incidental expenses. The cost of installation of the "Allowed Materials" shall be included in the applicable section of the Specifications covering the work.

11.0 MINIMUM WAGE RATES

11.1 This project is subject to the Minimum Wage Rates as determined by the New Mexico State Labor & Industrial Commission pursuant to Chapter 13, Section 13-14-11, NMSA 1978. The Minimum Wage Rates to be paid by Contractor and any Subcontractors to their employees on this project are as listed in the New Mexico State Labor and Industrial Commission Minimum Wage Rate Decision. A copy of this decision is bound in these documents immediately following this page.

11.2 All Contractors and Subcontractors shall submit one (1) certified copy of the project weekly payroll to the Santa Fe Solid Waste Management Agency, 149 Wildlife Way, Santa Fe, NM 87506, c/o Mr. Randall Kippenbrock, Executive Director and one (1) copy also certified directly to the New Mexico State Labor Commission – Public Works Division, Aspen Building, 1596 Pacheco Street, Santa Fe, New Mexico 87501, not later than five (5) working days after the close of each payroll period. The prime Contractor shall be responsible for the submission of copies of payrolls of all subcontractors.

11.3 Before using apprentices on this project, Contractor shall present to the Contracting Officer written evidence of registration of such employees with the U.S. Department of Labor, Bureau of Apprenticeship and Training, Western Bank Building (Room 1414), 505 Marquette Avenue, N.W., Albuquerque, New Mexico 87102, Telephone 766-2398. If the apprenticeship is not registered in a bona fide apprenticeship program as mentioned above, the journeyman's wage rate for that particular classification in which Contractor is working is applicable.

12.0 FORM OF CHANGE ORDER AND CHANGE ORDER NOTICE TO PROCEED

12.1 The following forms issued by the Owner are to be utilized by Contractor, Engineer, and the Owner pursuant to the requirements of the General Conditions.

13.0 STATE OF NEW MEXICO STATE CONSTRUCTION INDUSTRIES DIVISION

13.1 Contractor, at its own expense, shall secure any required construction permits from the State CID for this Project. Contractor shall adhere to the requirements established for inspections.

14.0 DISPOSAL REQUIREMENTS

14.1 Contractor shall be responsible for the disposal of all rubble, excess materials, etc. at an approved disposal facility.

Section 12
State of New Mexico Wage Rates Determination

STATE OF NEW MEXICO
NEW MEXICO DEPARTMENT OF
WORKFORCE SOLUTIONS
Labor Relations Division,
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
www.dws.state.nm.us

Wage Decision Approval Summary

1) Project Title: Santa Fe Solid Waste Management Agency BuRRT - Water Line and Misting System Improvements
Requested Date: 05/08/2017
Approved Date: 05/10/2017
Approved Wage Decision Number: SF-17-0809-A

Wage Decision Expiration Date for Bids: 09/07/2017

2) Physical Location of Jobsite for Project:
Job Site Address: 2600 Buckman Road
Job Site City: Santa Fe
Job Site County: Santa Fe

3) Contracting Agency Name (Department or Bureau): Santa Fe Solid Waste Management Agency
Contracting Agency Contact's Name: Randall Kippenbrock
Contracting Agency Contact's Phone: (505) 424-1850 Ext. 100

4) Estimated Bid Opening Date: 06/23/2017

5) Estimated total project cost: $307,000.00
a. Are any federal funds involved?: No
b. Does this project involve a building?: No
c. Is this part of a larger plan for construction on or appurtenant to the property that is subject to this project?: No
d. Are there any other Public Works Wage Decisions related to this project?: No
e. What is the ultimate purpose or functional use of the construction once it is completed?: The work consists of construction for water line and misting system improvements, including demolition of existing water lines and appurtenances, tempered water system improvements, potable water system improvements, overhead dust suppression system, and electrical systems for tempered and potable water systems and overhead dust suppression system. All work to be performed at the Santa Fe Solid Waste Management Agency's Buckman Road Recycling & Transfer Station.

6) Classifications of Construction:

Classification Type and Cost Total	Description
Highway/Utilities (A) **Cost:** $307,000.00	The work consists of construction for water line and misting system improvements, including demolition of existing water lines and appurtenances, tempered water system improvements, potable water system improvements, overhead dust suppression system, and electrical systems for tempered and potable water systems and overhead dust suppression system. All work is associated with improvements at the Buckman Road Recycling and Transfer Station.

STATE OF NEW MEXICO
NEW MEXICO DEPARTMENT OF
WORKFORCE SOLUTIONS
Labor Relations Division
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
www.dws.state.nm.us

PUBLIC WORKS PROJECT REQUIREMENTS

As a participant in a Public Works project valued at more than $60,000 in the State of New Mexico, the following list addresses many of the responsibilities that are defined by statute or regulation to each project stakeholder.

Contracting Agency

- Ensure that all Contractors wishing to bid on a Public Works project when the project is $60,000 or more are actively registered with the Public Works and Apprenticeship Application (PWAA) website: http://www.dws.state.nm.us/pwaa (Contractor Registration) prior to bidding.
- Please submit Notice of Award (NOA) and Subcontractor List(s) to the PWAA website promptly after the project is awarded.
- Please update the Subcontractor List(s) on the PWAA website whenever changes occur.

General Contractor

- Provide a complete Subcontractor List and Statements of Intent (SOI) to Pay Prevailing Wages for each Contractor to the Contracting Agency within 3 (three) days of award.
- Ensure that all Subcontractors wishing to bid on a Public Works project have an active Contractor Registration with the Public Works and Apprenticeship Application (PWAA) website: http://www.dws.state.nm.us/pwaa prior to bidding when their bid will exceed $60,000.
- Submit bi-weekly certified payrolls to the Contracting Agency.
- Make certain the Public Works Apprentice and Training Act contributions are paid either to an approved Apprenticeship Program or to the Public Works Apprentice and Training Fund.
- Confirm the Wage Rate poster, provided in PWAA, is displayed at the job site in an easily accessible place.
- Make sure, when a project has been completed, the Affidavits of Wages Paid (AWP) are sent to the Contracting Agency.

Subcontractor

- Ensure that all Subcontractors wishing to bid on a Public Works project have an active Contractor Registration with the Public Works and Apprenticeship Application (PWAA) website: http://www.dws.state.nm.us/pwaa prior to bidding when their bid will exceed $60,000.
- Submit bi-weekly certified payrolls to the General Contractor(s).

STATE OF NEW MEXICO
NEW MEXICO DEPARTMENT OF
WORKFORCE SOLUTIONS
Labor Relations Division
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
www.dws.state.nm.us

- Make certain the Public Works Apprentice and Training Act contributions are paid either to an approved Apprenticeship Program or to the Public Works Apprentice and Training Fund.

Additional Information

Reference material and forms may be found at New Mexico Department of Workforce Solutions Public Works web pages at: http://www.dws.state.nm.us/new/Labor_Relations/publicworks.html.

CONTACT INFORMATION

Contact the Labor Relations Division for any questions relating to Public Works projects by email at public.works@state.nm.us or call (505) 841-4400.

TYPE "A" - STREET, HIGHWAY, UTILITY & LIGHT ENGINEERING

Effective January 1, 2017

Trade Classification	Base Rate	Fringe Rate On and Prior to February 10, 2017	Fringe Rate After February 10, 2017
Bricklayer/Blocklayer/Stonemason	23.46	8.40	8.40
Carpenter/Lather	23.75	9.27	9.27
Cement Mason	17.42	6.35	6.35
Ironworker	26.50	14.32	14.32
Painter (Brush/Roller/Spray)	16.60	5.78	5.78
Plumber/Pipefitter	22.84	7.48	7.48
Electricians (outside)			
Groundman	21.81	10.92	10.92
Equipment Operator	31.31	13.39	13.39
Lineman/Wireman or Tech	36.83	14.82	14.82
Cable Splicer	40.51	15.38	15.38
Laborers			
Group I	12.20	5.30	5.30
Group II	12.50	5.30	5.30
Group III	12.90	5.30	5.30
Operators			
Group I	16.69	6.03	6.33
Group II	17.44	6.03	6.33
Group III	17.55	6.03	6.33
Group IV	17.63	6.03	6.33
Group V	17.75	6.03	6.33
Group VI	17.89	6.03	6.33
Group VII	18.27	6.03	6.33
Group VIII	18.50	6.03	6.33
Group IX	25.45	6.03	6.33
Group X	28.35	6.03	6.33
Truck Drivers			
Group I	16.00	7.02	7.02
Group II	16.00	7.02	7.02
Group III	16.00	7.02	7.02
Group IV	16.00	7.02	7.02

NOTE: SUBSISTENCE, ZONE AND INCENTIVE PAY APPLY ACCORDING TO THE PARTICULAR TRADES COLLECTIVE BARGAINING AGREEMENT. DETAILS ARE LOCATED AT WWW.DWS.STATE.NM.US.

This Page Intentionally Left Blank

Section 13
Technical Specifications

This Page Intentionally Left Blank

I, Gregory S. Larson, Registered Professional Engineer No. 20820 hereby certify that these contract documents for Santa Fe Solid Waste Management Agency, Buckman Road Recycling & Transfer Station, Water Line and Misting System Improvements were prepared by me, or directly under my supervision, and are true and correct to the best of my knowledge and belief.

_____

Registered Professional Engineer
State of New Mexico

This Page Intentionally Left Blank

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 LOCATION OF WORK

A. The work of this Contract is located at the Buckman Road Recycling and Transfer Station (BuRRT) in Santa Fe, New Mexico.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and construct the Water Line and Misting System Improvements in their entirety as shown on the Drawings and as specified herein.

B. The Work includes, but is not necessarily limited to, the following:

1. Mobilization and Demobilization
2. Demolition of Existing Water Lines and Appurtenances
3. Tempered water system improvements
4. Potable water system improvements
5. Overhead dust suppression system
6. Electrical systems for tempered and potable water systems and overhead dust suppression system

1.03 CONTRACT TIME

A. Perform work to accommodate applicable permitting review and building permits. The Contractor shall include time for these requirements, as well as inspection. All the work shall be completed within 60 calendar days

1.04 CONTRACTOR'S USE OF PREMISES

A. Contractor shall have complete and exclusive use of the premises for the performance of the Work.

B. Contractor shall limit the use of the premises for his/her Work and for storage to allow for:

1. Work by other contractors.
2. Owner occupancy
3. Public use.

C. Coordinate use of premises with other contractors, Owner, Public users of facility, and Engineer.

D. Contractor shall assume full responsibility for security of all his/her and his/her subcontractors materials and equipment stored on the site.

E. If directed by the Owner, move any stored items which interfere with operations of Owner or other contractors.

F. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

G. The Contractor shall provide spill containment for all regulated materials and NFPA rated containment for all flammable materials.

1.05 OWNER OCCUPANCY

A. Owner will occupy premises during performance of the work for the conduct of his/her normal operations. Coordinate all construction operations with Owner to minimize conflict and to facilitate Owner usage.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 7,000 feet above sea level.

B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of -20 degrees F to 120 degrees F.

1.07 DISPOSAL OF MATERIAL

A. Salvageable material and equipment listed hereinafter shall become the property of the Owner. Dismantle all such items to a size that can be readily handled and deliver them to an on-site designated storage area as directed by the Owner.

B. The following materials and items associated with the removal of existing piping and appurtenances as shown on the Drawings shall remain the property of the Owner and stored where directed on the site.

1. All copper piping.

2. All scrap metal.

C. All other material and items of equipment shall become the Contractor's property and must be removed from the site.

D. The storage or sale of removed items on the site will not be allowed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Measurement and payment shall be as specified in this Section.

B. Work to be performed under this contract will be paid for on a Unit Price or Lump Sum basis under the appropriate Bid Items in the Bid Schedule. All costs for Work shown on Drawings or described in Specifications shall be incidental to the Contract and shall be included in the Contract Price. A claim by the Contractor for extra compensation for an item shown on the Drawings or described in the Specifications will not be considered for any reason including but not limited to the claim that it does not fall within the scope of one of the Bid Items. All work covered under the Standard Specifications shall be paid as outlined in this Section, NOT as indicated in the Standard Specifications.

C. Contractor shall, within 10 days of receipt of Notice to Proceed, submit a schedule of values in accordance with Section 01370 for all lump sum bid items.

D. General scope of work under each bid item includes all labor and materials required for construction of completely functional and operational facilities as shown on the Drawings and in these Specifications.

E. GENERAL. The total base bid price shall cover all work required by the contract documents for construction of a completely functional and operational facility. All costs in connection with the proper and successful completion of the work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plans, equipment, and tools; and performing all necessary labor and supervision to fully complete the work in accordance with these contract documents, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the bid proposal shall be considered a subsidiary obligation of Contractor and as such, all costs in connection therewith shall be included in the bid prices.

F. ESTIMATED QUANTITIES. All estimated quantities for unit price bid items stipulated in the bid proposal are approximate and are to be used only (a) as a basis for estimating the probable cost of the work and (b) for the purpose of comparing the bids submitted for the work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for work and materials will be the actual amount of work done and materials furnished.

G. MEASUREMENT AND PAYMENT. All measurements and payments will be based on completed work performed in strict accordance with the Drawings and Specifications and in accordance with contract-unit prices and schedule of values. Incidental work and items not listed in the contract-unit price schedule will not be paid for separately, but will be included in the payment for the listed item or items to which such incidental work applies. Measurement and payment for lump sum items shall be full compensation for all labor, equipment, materials, testing and incidentals necessary to perform the work in accordance with these contract

documents, and shall include all else incidental thereto for which separate payment is not provided under other items.

Item No. 1 - Mobilization/Demobilization

Shall include all costs for Contractor's mobilization, insurance and bond, construction permits and fees, job trailers, site administration expenses, and utilities for the entire project, costs for contract closeout, site cleanup, and all costs associated with Contractor's demobilization from the site.

Payment for mobilization and demobilization shall be on a Lump Sum basis as noted in the Bid Schedule.

Item No. 2 – Demolition of Existing Water Lines and Appurtenances

Shall include all labor, materials, equipment, testing, and incidentals required for the demolition of water lines and related mechanical and electrical removals as shown on the Drawings and as specified herein. Prices and payment shall include demolition of existing tempered water piping, valves, potable water piping, emergency eyewash and showers, heat trace systems and other appurtenances as specified, shown, or required for the completion of work; and all else incidental thereto for which separate payment is not provided under other Bid Items.

Payment to Demolish Existing Water Lines and Appurtenances shall be on a Lump Sum basis as noted in the Bid Schedule.

Item No. 3 – Tempered Water System Improvements

Shall include all labor, materials, equipment, and incidentals required for the construction of the Tempered Water System Improvements complete-in-place as shown on the Drawings and as specified herein. Tempered water piping is designated as TW on the construction drawings. Prices and payment shall include furnishing, installing and testing tempered water piping and insulation; valves, wall penetrations, pipe supports, emergency eyewash and shower, pipe bollards, recirculation pump and all else incidental thereto for which separate payment is not provided under other Bid Items are to be included under this Bid Item.

Payment for the Tempered Water System Improvements shall be on a Lump Sum basis as noted in the Bid Schedule.

Item No. 4 – Potable Water System Improvements

Shall include all labor, materials, equipment, and incidentals required for the construction of the Potable Water System Improvements complete-in-place as shown on the Drawings and as specified herein. Potable water piping is designated as PTW on the construction drawings. Prices and payment shall include furnishing, installing and testing potable water piping and insulation, valves, wall penetrations, pipe supports, hopper dust suppression system and supports, wash hose stations and all else incidental thereto for which separate payment is not provided under other Bid Items are to be included under this Bid Item.

Payment for the Potable Water System Improvements shall be on a Lump Sum basis as noted in the Bid Schedule.

Item No. 5 – Overhead Dust Suppression System

Shall include all labor, materials, equipment, and incidentals required for the construction of the Overhead Dust Suppression System complete-in-place as shown on the Drawings and as specified herein. Dust suppression system hose is designated as overhead dust suppression system high pressure hose on the construction drawings. Prices and payment shall include furnishing, installing and testing nozzles, high pressure hose and pipe, valves, high pressure booster pump, control panel all else incidental thereto for which separate payment is not provided under other Bid Items are to be included under this Bid Item.

Payment for the Overhead Dust Suppression System shall be on a Lump Sum basis as noted in the Bid Schedule.

Item No. 6 – Electrical Improvements

Shall include all labor, materials, equipment, and incidentals required for the construction of the Electrical Improvements complete-in-place as shown on the Drawings and as specified herein. Prices and payment shall include furnishing, installing and testing heat trace systems, conduit and all else incidental thereto for which separate payment is not provided under other Bid Items are to be included under this Bid Item.

Payment for the Electrical Improvements shall be on a Lump Sum basis as noted in the Bid Schedule.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

This Page Intentionally Left Blank

SECTION 01026
APPLICATION FOR PAYMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. The accepted Schedule of Values, Section 01370, shall be used as the basis for the Contractor's Application for Payment.

1.02 RELATED WORK

A. Agreement between Owner and Contractor is included in Division 0.

B. Standard General Conditions of the Construction Contract are included in Division 0.

C. Schedule of Values are included in Section 01370.

D. Contract Closeout is included in Section 01700.

1.03 SUBMITTALS

A. Submit, in accordance with Section 01300, applications typed on forms provided by the Owner, Application for Payment, with itemized data typed on 8-1/2-in by 11-in or 8-1/2-in by 14-in white paper continuation sheets.

B. Provide itemized data on continuation sheet.

1. Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Provide construction photographs.

1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.

3. Execute certification with signature of a responsible officer of Contract firm.

B. Continuation Sheets

1. Fill in total list of all scheduled component items of Work, with item number and scheduled dollar value for each item.

2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored.
   a. Round off values to nearest dollar, or as specified for Schedule of Values.

3. List each Change Order executed prior to date of submission, at the end of the continuation sheets.
   a. List by Change Order Number and description, as for an original component item of work.

4. To receive approval for payment on component material stored on site, submit copies of the original paid invoices with the application for payment.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Owner or the Engineer requires substantiating data, submit suitable information, with a cover letter identifying.

1. Project.

2. Application number and date.

3. Detailed list of enclosures.

4. For stored products:
   a. Item number and identification as shown on application.
   b. Description of specific material.

B. Submit one copy of data and cover letter for each copy of application.

C. As a prerequisite for payment, submit a "Surety Acknowledgement of Payment Request" letter showing amount of progress payment which the Contractor is requesting.

D. Maintain an updated set of drawings to be used as record drawings in accordance with Section 01720. As a prerequisite for monthly progress payments, exhibit the updated record drawings for review by the Owner and the Engineer.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified for progress payments.

B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

C. Submit all Project Record Documents in accordance with Section 01720, and as indicated elsewhere in the specifications.

1.07 SUBMITTAL PROCEDURE

A. Submit Applications for Payment to the Engineer at the times stipulated in the Agreement.

B. Number: Five copies of each Application.

C. When the Engineer finds Application properly completed and correct, he/she will transmit certificate for payment to Owner, with copy to Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

This Page Intentionally Left Blank

SECTION 01040
PROJECT COORDINATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This section specifies requirements for project coordination including:

1. Coordination.

2. Administrative and supervisory personnel.

3. General installation provisions.

4. Cleaning and protection.

1.02 COORDINATION

A. Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

1. Where installation of one component depends on installation of other components before or after its own installation, schedule activities in the sequence required to obtain the best results.

2. Where space is limited, coordinate installation of different components to assure maximum accessibility for maintenance, service and repair.

3. Make provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved outlining required coordination procedures. Include required notices, reports and attendance at meeting.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

1.03 ADMINISTRATIVE PROCEDURES

A. Coordinate scheduling and timing of administrative procedures with other activities to avoid conflicts and ensure orderly progress. Such activities include:

1. Preparation of schedules.

2. Installation and removal of temporary facilities.

3. Delivery and processing of submittals.

4. Progress meetings.

5. Project closeout activities.

1.04 STAFF NAMES

A. Within 5 days of Notice to Proceed, submit a list of Contractor's staff assignments, including Superintendent and personnel at the site; identify individuals, their duties and responsibilities and telephone numbers.

1.05 INSPECTION OF CONDITIONS

A. The Installer of each component shall inspect the substrate and conditions under which Work is performed. Do not proceed until unsatisfactory conditions have been corrected.

1.06 MANUFACTURER'S INSTRUCTIONS

A. Comply with manufacturer's installation instructions and recommendations, to the extent that they are more stringent than requirements in Contract Documents.

B. Inspect material immediately upon delivery and again prior to installation. Reject damaged and defective items.

1.07 VISUAL EFFECTS

A. Provide uniform joint widths in exposed Work. Arrange joints to obtain the best effect. Refer questionable choices to the Engineer for decision.

B. Recheck measurements and dimensions, before starting installation.

C. Install each component during weather conditions and project status that will ensure the best results. Isolate each part from incompatible material as necessary to prevent deterioration.

1.08 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

1. Clean and maintain completed construction as often as necessary through the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

2. Limiting Exposure: Supervise operations to ensure that no part of construction, completed or in progress, is subject to harmful or deleterious exposure. Such exposures include:
   a. Excessive static or dynamic loading.
   b. Excessive internal or external pressures.
   c. Excessive weathering.
   d. Excessively high or low temperatures or humidity.
   e. Air contamination or pollution.
   f. Water or ice.
   g. Chemicals or solvents.
   h. Heavy traffic, soiling, staining and corrosion.
   i. Bird, rodent and insect infestation.

j. Unusual wear or other misuse.
k. Contact between incompatible materials.
l. Theft or vandalism.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

This Page Intentionally Left Blank

SECTION 01046
CONTROL OF WORK

PART 1 GENERAL

1.01 SITE

A. Furnish materials and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the Contract Time. If at any time such operations appear to the Engineer to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, Engineer may order the Contractor to increase the efficiency, change the character or increase the equipment and/or materials, the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his/her obligations to secure the quality of the work and rate of progress required.

1.02 PRIVATE LAND

A. Do not enter or occupy private land outside of easements, except by permission of the land owner.

1.03 PIPE LOCATIONS

A. Locate pipelines substantially as indicated on the Drawings. The Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

1.04 MAINTENANCE OF TRAFFIC

A. Detours around construction will be subject to the approval of the Owner and the Engineer. Where detours are permitted, provide all necessary barricades and signs as required to divert the flow of traffic. Expedite construction operations while traffic is detoured. Periods when traffic is being detoured will be strictly controlled by the Owner.

1.05 CARE AND PROTECTION OF PROPERTY

A. The Contractor shall be responsible for the preservation of all public and private property and use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his/her expense, to a condition similar or equal to that existing before the damage was done, or he/she shall make good the damage in other manner acceptable to the Engineer.

1.06 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains and electric and telephone cables, whether or not they are shown on the Drawings. Carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by him/her at his/her expense.

B. Assistance will be given the Contractor in determining the location of existing services. The Contractor, however, shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water services, drain lines and sewers). Maintain services to buildings and pay costs or charges resulting from damage thereto.

C. Protection of existing utilities and structures as described in this Section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the Total Price Bid in the Bid Form.

1.07 WATER FOR CONSTRUCTION PURPOSES

A. Water for construction purposes is available to the Contractor via onsite potable water supply. Contractor shall coordinate access requirements and use of water with the Owner.

1.08 MAINTENANCE OF FLOW

A. Provide for the flow of sewers, drains and water courses interrupted during the progress of the work, and immediately cart away and remove all offensive matter. Discuss the entire procedure of maintaining existing flow with the Engineer well in advance of the interruption of any flow.

1.09 COOPERATION WITHIN THIS CONTRACT

A. All firms or persons authorized to perform any work under this Contract shall cooperate with the Contractor and his/her Subcontractors or trades and shall assist in incorporating the work of other trades where necessary or required.

B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

1.10 CLEANUP AND DISPOSAL OF EXCESS MATERIAL

A. During the course of the work, keep the site of operations as clean and neat as possible. Contractor may dispose of construction materials at BuRRT at the current disposal rates. Dispose of all residue resulting from the construction work and, at the conclusion of the work, remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction operations and leave the entire site of the work in a neat and orderly condition.

B. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the Contractor and his/her subcontractors shall comply with all applicable Federal, State and local laws and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and in other related sections.

C. Disposal of excess excavated material in wetlands, stream corridors and plains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by him will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. The Contractor will be required to remove the fill and restore the area impacted at no increase in the Contract Price.

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Engineer shall schedule and administer pre-construction meeting and specially called meetings throughout progress of the work.

1. Prepare agenda for meetings.

2. Make physical arrangements for meetings.

3. Preside at meetings.

4. Record the minutes; include significant proceedings and decisions.

5. Reproduce and distribute copies of minutes within 5 working days after each meeting.
   a. To participants in the meeting.
   b. To parties affected by decisions made at the meeting.

B. Representatives of Contractors, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. Attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.02 RELATED REQUIREMENTS

A. Instructions to Bidders are included in Section 2 of the Contract Documents.

B. Construction Schedules are included in Section 01310.

C. Shop Drawings, Working Drawings and Samples are included in Section 01300.

D. Project Record Documents are included in Section 01720.

1.03 PRE-CONSTRUCTION MEETING

A. Schedule a preconstruction meeting no later than 10 days after date of Notice to Proceed.

B. Location: A central site, convenient for all parties, designated by the Owner.

C. Attendance

1. Owner's Representative.

2. Engineer and his/her professional consultants.

3. Contractor's Superintendent.

4. Major Subcontractors.

5. Others as appropriate.

D. Suggested Agenda

1. Distribution and discussion of:
   a. List of major subcontractors and suppliers.
   b. Projected Construction Schedules.

2. Critical work sequencing.

3. Major equipment deliveries and priorities.

4. Project Coordination.
   a. Designation of responsible personnel.

5. Procedures and processing of:
   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change Orders.
   e. Applications for Payment.

6. Adequacy of distribution of Contract Documents.

7. Procedures for maintaining Record Documents.

8. Use of premises:
   a. Office, work and storage areas.
   b. Owner's requirements.

9. Construction facilities, controls and construction aids.

10. Temporary utilities.

11. Housekeeping procedures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes the requirements for compiling, processing and transmitting submittals required for execution of the project.

B. Submittals are categorized into two types: Action Submittals and Informational Submittals, as follows:

1. Action Submittal: Written and graphic information submitted by the Contractor that requires the Engineer's approval. The following are examples of action submittals:
   a. Shop drawings (including working drawing and product data)
   b. Samples
   c. Operation & maintenance manuals
   d. Site Usage Plan (Contractor's staging - including trailer siting and material laydown area)
   e. Schedule of values
   f. Payment application format

2. Informational Submittal: Information submitted by the Contractor that does not require the Engineer's approval. The following are examples of informational submittals:
   a. Shop Drawing Schedule
   b. Construction Schedule
   c. Statements of Qualifications
   d. Health and Safety Plans
   e. Construction Photography and Videography
   f. Work Plans
   g. Maintenance of Traffic Plans
   h. Outage Requests
   i. Proposed Testing Procedures
   j. Test Records and Reports
   k. Vendor Training Outlines/Plans
   l. Test and Start-Up Reports
   m. Certifications
   n. Record Drawings
   o. Record Shop Drawings
   p. Submittals required by laws, regulations and governing agencies
   q. Submittals required by funding agencies
   r. Other requirements found within the technical specifications
   s. Warranties and Bonds
   t. As-Built Surveys
   u. Contract Close-out Documents

1.02 RELATED WORK

A. Additional requirements may be specified in the General Conditions for the Contract.

B. Additional submittal requirements may be specified in the respective technical Specification Sections.

C. Contract closeout submittals are included in Section 01700.

D. Warranties and Bonds are included in Section 01740.

E. Applications for Payment are included in Section 01026.

F. Construction Schedules are included in Section 01310.

G. Project Record Documents are included in Section 01720.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. All submittals shall be clearly identified as follows:

1. Date of Submission.

2. Project Number.

3. Project Name.

4. Contractor Identification.
   a. Contractor.
   b. Supplier.
   c. Manufacturer.
   d. Manufacturer or supplier representative.

5. Identification of the Product.

6. Reference to Contract Drawing.

7. Reference to specification section number, page and paragraph(s).

8. Reference to applicable standards, such as ASTM or Federal Standards numbers.

9. Indication of Contractor's approval.

10. Contractor's Certification statement.

11. Identification of deviations from the Contract Documents, if any.

12. Reference to previous submittal (for resubmittals).

13. Made in America (when required by the Contract).

B. Submittals shall be clear and legible, and of sufficient size for legibility and clarity of the presented data.

C. Submittal Log. Maintain a log of all submittals. The submittal log shall be kept accurate and up to date. This log should include the following items (as applicable):

1. Description.

2. Submittal Number.

3. Date transmitted to the Engineer.

4. Date returned to Contractor (from Engineer).

5. Status of Submittal (Approved/Not Approved/etc.).

6. Date of Resubmittal to Engineer and Return from Engineer (if applicable and repeat as necessary).

7. Date material released for fabrication.

8. Projected (or actual) delivery date .

D. Numbering System. Utilize the following submittal identification numbering system:

1. The first character shall be a D, S, M or I which represents Shop Drawing (including working drawings and product data), Sample, Manual (Operating & Maintenance) or Informational, respectively.

2. The next five digits shall be the applicable Section Number.

3. The next three digits shall be the sequential number of each separate item or drawing submitted under each Specification Section, in the chronological order submitted, starting at 001.

4. The last character shall be a letter, A to Z, indicating the submission (or resubmission) of the same submittal, i.e., "A" = 1st submission, "B" = 2nd submission, "C" = 3rd submission, etc. A typical submittal number would be as follows:

D-03300-008-B.
D = Shop Drawing
03300 = Section for Concrete.
008 = the eighth different submittal under this Section.
B = the second submission (first resubmission) of that particular shop drawing.

E. Variances

1. Notify the Engineer in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.

2. Notify the Engineer in writing, at the time of re-submittal (resubmission), of all deviations from previous submissions of that particular shop drawing, except those deviations which are the specific result of prior comments from the Engineer.

F. Action Submittals

1. Shop Drawings, Working Drawings, Product Data and Samples.

a. Shop Drawings.
   1) Shop drawings as defined in the General Conditions, and as specified in individual Sections may include, but are not necessarily limited to, custom prepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual shop work manufacturing instructions, custom templates, valve schedules, wiring diagrams, coordination drawings, equipment inspection and test reports, and performance curves and certifications, as applicable to the work.
   2) Contractor shall verify all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and coordinate each item with other related shop drawings and the Contract requirements.
   3) All details on shop drawings shall clearly show the relation of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted.
   4) All shop drawings submitted by subcontractors and vendors shall be reviewed by the Contractor. Contractor shall confirm, materials, dimensions, catalog numbers, technical data and performance criteria; and shall coordinate with other related shop drawings and the Contract requirements. In addition, Contractor shall confirm existing field conditions and dimensions and assure that the submittal is coordinated and compatible with existing conditions. Submittals directly from subcontractors or vendors will not be accepted by the Engineer.
   5) The Contractor shall be responsible the accuracy of the subcontractor's or vendor's submittal; and, for their submission in a timely manner to support the requirements of the Contractor's construction schedule. Shop drawings found to be inaccurate or otherwise in error shall be returned to the subcontractor or vendor to correct, before submission to the Engineer. All shop Drawings shall be approved by the Contractor.
   6) Delays to construction due to the untimely submission of submittals will constitute inexcusable delays, for which Contactor shall not be eligible for additional cost nor additional contract time. Inexcusable delays consist of any delay within the Contactor's control.
   7) Submittals for equipment specified under Divisions 11, 13, 14, 15 and 16 shall include a listing of installations where identical or similar equipment manufactured by that manufacturer has been installed and in operation for a period of at least five years.

b. Working Drawings
   1) Detailed installation drawings (sewers, equipment, piping, electrical conduits and controls, HVAC work, and plumbing, etc.) shall be prepared and submitted for review and approval by the Engineer prior to installing such work. Installation drawings shall be to-scale and shall be fully dimensioned.
   2) Piping working drawings shall show the laying dimensions of all pipes, fittings, valves, as well as the equipment to which it is being connected. In addition, all pipe supports shall be shown.
   3) Equipment working drawings shall show all equipment dimensions, anchor bolts, support pads, piping connections and electrical connections. In addition, show clearances required around such equipment for maintenance of the equipment.
   4) Electrical working drawings shall show conduits, junction boxes, disconnects, control devices, lighting fixtures, support details, control panels, lighting and

power panels, and Motor Control Centers. Coordinate all locations with the Contract Documents and the Contractor's other working drawings.

c. Product Data
   1) Product data, as specified in individual Specification Sections, include, but are not limited to, the manufacturer's standard prepared data for manufactured products (catalog data), such as the product specifications, installation instructions, availability of colors and patterns, rough-in diagrams and templates, product photographs (or diagrams), wiring diagrams, performance curves, quality control inspection and reports, certifications of compliance (as specified or otherwise required), mill reports, product operating and maintenance instructions, recommended spare parts and product warranties, as applicable.

d. Samples
   1) Furnish, samples required by the Contract Documents for the Engineer's approval. Samples shall be delivered to the Engineer as specified or directed. Unless specified otherwise, provide at least two samples of each required item. Materials or equipment for which samples are required shall not be used in the work unless and until approved by the Engineer.
   2) Samples specified in individual Specification Sections, include, but are not limited to: physical examples of the work (such as sections of manufactured or fabricated work), small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and other specified units of work.
   3) Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify and Contract Requirements.
   4) Approved samples not destroyed in testing shall be sent to the Engineer or stored at the site of the work. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which fail testing or are not approved will be returned to the Contractor at his expense, if so requested at time of submission.

e. Professional Engineer (P.E.) Certification Form
   1) If specifically required in any of the technical Specification Sections, submit a Professional Engineer (P.E.) Certification for each item required, using the form appended to this Section, signed and sealed by the P.E. licensed or registered in the state wherein the work is located.

2. Contractor's Certification
   a. Each shop drawing, working drawings, product data, and sample shall have affixed to it the following Certification Statement:
      1) "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements."
   b. Shop drawings, working drawings, and product data sheets 11-in x 17-in and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The transmittal cover sheet for each identified shop drawing shall fully describe the packaged data and include a listing of all items within the package.

3. The review and approval of shop drawings, working drawings, product data, or samples by the Engineer shall not relieve the Contractor from the responsibility for the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will have no responsibility therefor.

4. Project work, materials, fabrication, and installation shall conform to approved shop drawings (including working drawings and product data) and applicable samples.

5. No portion of the work requiring a shop drawing (including working drawings and product data) or sample shall be started, nor shall any materials be fabricated or installed before approval of such item. Procurement, fabrication, delivery or installation or products or materials that do not conform to approved shop drawings shall be at the Contractor's risk. Furthermore, such products or materials delivered or installed without approved shop drawings, or in non-conformance with the approved shop drawings will not be eligible for progress payment until such time as the product or material is approved or brought into compliance with approved shop drawings. Neither the Owner nor Engineer will be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

6. Operation and Maintenance Data
    a. Operation and maintenance data shall be submitted in assembled manuals as specified. Such manuals shall include detailed instructions for Owner personnel on safe operation procedures, controls, start-up, shut-down, emergency procedures, storage, protection, lubrication, testing, trouble-shooting, adjustments, repair procedures, and other maintenance requirements.
    b. Schedule of Values
        1) On projects consisting of lump sums (in whole or in part) submit a proposed schedule of values providing a breakdown of lump sum items in to reasonably small components – generally disaggregated by building, area, and/or discipline. The purpose of the schedule of values is for processing partial payment applications. If requested by the Engineer, provide sufficient substantiation for all or some items as necessary to determine the proposed schedule of values is a reasonable representation of the true cost breakdown of the Work. The schedule of values shall not be unbalanced to achieve early payment or over-payment in excess of the value of work or any other mis-distribution of the costs. If, in the opinion of the Engineer, the schedule of values is unbalanced, Contractor shall reallocate components to achieve a balanced schedule acceptable to Engineer.
    c. Payment Application Format
        1) If an application form is included in the Contract Documents, use that form unless otherwise approved by the Engineer and Owner. If an application form is not included in the Contract Documents, Contractor may propose a form for approval.

7. Site Usage
    a. Submit a proposed site staging plan, including but not limited to the location of office trailers, storage trailers and material laydown. Such plan shall be a graphic presentation (drawing) of the proposed locations; and, shall include on-site traffic modifications, and temporary utilities, as may be applicable.

G. Informational Submittals

1. Shop Drawing Schedule
   a. Prepare and submit a schedule indicating when shop drawings are required to be submitted to support the as-planned construction schedule. The submittal schedule shall allow sufficient time for preparation and submittal, review and approval, and fabrication and delivery to support the construction schedule.

2. Construction Schedule
   a. Prepare and submit construction schedules and monthly status reports as specified.

3. Statements of Qualifications
   a. Provide evidence of qualification, certification, or registration, as required in the Contract Documents, to verify qualifications of licensed land surveyor, professional engineer, materials testing laboratory, specialty subcontractor, technical specialist, consultant, specialty installer, and other professionals.
   b. Health and Safety Plans
      1) When specified, prepare and submit a general company Health and Safety Plan (HSP), modified or supplemented to include job-specific considerations.

4. Construction Photography and Videography
   a. Provide periodic construction photographs and videography as specified – including but not limited to preconstruction photographs and/or video, monthly progress photos and/or video and post-construction photographs and/or video.

5. Work Plans
   a. Prepare and submit copies of all work plans needed to demonstrate to the Owner that Contractor has adequately thought-out the means and methods of construction and their interface with existing facilities.

6. Maintenance of Traffic Plans
   a. Prepare maintenance of traffic plans where and when required by the Contract Documents and by local ordinances or regulations. If Contractor is not already knowledgeable about local ordinances and regulations regarding maintenance of traffic requirements, become familiar with such requirements and include all costs for preparation and submittal of traffic management plans and all associated costs for permits and fees to implement the traffic management plan, in the bid amount. In addition, unless a supplemental payment provision is provided in the bid form, include the cost of police attendance, when required.

7. Outage Requests
   a. Provide sufficient notification of any outages required (electrical, flow processes, etc.) as may be required to tie-in new work into existing facilities. Unless specified otherwise elsewhere, a minimum of seven calendar days' notice shall be provided.

8. Proposed Testing Procedures
   a. Prepare and submit testing procedures it proposes to use to perform testing required by the various technical specifications.

9. Test Records and Reports
    a. Provide copies of all test records and reports as specified in the various technical specifications.

10. Vendor Training Outlines/Plans
    a. At least two weeks before scheduled training of Owner's personnel, provide lesson plans for vendor training in accordance with the specification for O&M manuals.

11. Test and Start-up Reports
    a. Manufacture shall perform all pre-start-up installation inspection, calibrations, alignments, and performance testing as specified in the respective Specification Section. Provide copies of all such test and start-up reports.

12. Certifications
    a. Provide various certifications as required by the technical specifications. Such certifications shall be signed by an officer (of the firm) or other individual authorized to sign documents on behalf of that entity.
    b. Certifications may include, but are not limited to:
        1) Welding certifications and welders qualifications
        2) Certifications of Installation, Testing and Training for all equipment
        3) Material Testing reports furnished by an independent testing firm
        4) Certifications from manufacturer(s) for specified factory testing
        5) Certifications required to indicate compliance with any sustainability or LEEDS accreditation requirements indicated in the Contract Documents

13. Record Drawings
    a. No later than Substantial Completion, submit a record of all changes during construction not already incorporated into drawings – in accordance with specification on Project Record Documents.

14. Record Shop Drawings
    a. Before final payment is made, furnish one set of record shop drawings to the Engineer. These record shop drawings shall be in conformance with the approved documents and should show any field conditions which may affect their accuracy.
    b. Submittals required by laws, regulations and governing agencies
        1) Prepare and submit all documentation required by state or local law, regulation or government agency directly to the applicable agency. This includes, but is not limited to, notifications, reports, certifications, certified payroll (for projects subject to wage requirements) and other documentation required to satisfy all requirements. Provide to Engineer one copy of each submittal made in accordance with this paragraph.
    c. Submittals required by funding agencies
        1) Prepare and submit all documentation required by funding agencies. This includes, but is not limited to segregated pay applications and change orders when required to properly allocate funds to different funding sources; and certified payrolls for projects subject to wage requirements. Provide one copy of each submittal made in accordance with this paragraph to the Engineer.

15. Other requirements of the technical Specification Sections
    a. Comply with all other requirements of the technical specifications.

16. Warranties and Bonds
    a. Assemble a booklet or binder of all warranties and bonds as specified in the various technical specifications and in accordance with the specification on Warranties and Bonds; and provide two originals to the Engineer.

17. As-Built Surveys
    a. Engage the services of a licensed land surveyor in accordance with the Project Controls (Surveying) specification. Prior to Final Completion, provide an as-built survey of the constructed facility, as specified.

18. Contract Close-Out Documents
    a. Submit Contract documentation as indicated in the specification for Contract Close-out.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTAL SCHEDULE

A. Provide an initial submittal schedule at the pre-construction meeting for review by Owner and Engineer. Incorporate comments from Owner or Engineer into a revised submittal schedule.

B. Maintain the submittal schedule and provide sufficient copies for review by Owner and Engineer. An up-to-date submittal schedule shall be provided at each project progress meeting.

3.02 TRANSMITTALS

A. Prepare separate transmittal sheets for each submittal. Each transmittal sheet shall include at least the following: the Contractor's name and address, Owner's name, project name, project number, submittal number, description of submittal and number of copies submitted.

B. Submittals shall be transmitted or delivered directly to the office of the Engineer, as indicated in the Contact Documents or as otherwise directed by the Engineer.

C. Provide copies of transmittals forms or cover letters (without attachments) directly to the Resident Project Representative.

3.03 PROCEDURES

A. Action Submittals

1. Contractor's Responsibilities
    a. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work of other related Sections, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required). Coordinate with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. Extensions to the Contract Time will not be approved for the Contractor's failure to transmit submittals sufficiently in advance of the Work.

b. The submittals of all shop drawings (including working drawings and product data) shall be sufficiently in advance of construction requirements to allow for possible need of re-submittals, including the specified review time for the Engineer.
c. No less than 30 calendar days will be required for Engineer's review time for shop drawings and O&M manuals involving only one engineering discipline. No less than 45 calendar days will be required for Engineer's review time for shop drawings and O&M manuals that require review by more than one engineering discipline. Resubmittals will be subject to the same review time.
d. Submittals of operation and maintenance data shall be provided within 30 days of approval of the related shop drawing(s).
e. Before submission to the Engineer, review shop drawings as follows:
    1) Make corrections and add field measurements, as required
    2) Use any color for its notations except red (reserved for the Engineer's notations) and black (to be able to distinguish notations on black and white documents)
    3) Identify and describe each and every deviation or variation from Contract documents or from previous submissions, except those specifically resulting from a comment from the Engineer on a previous submission
    4) Include the required Contractor's Certification statement
    5) Provide field measurements (as needed)
    6) Coordinate with other submittals
    7) Indicate relationships to other features of the Work
    8) Highlight information applicable to the Work and/or delete information not applicable to the Work
f. Submit the following number of copies:
    1) Shop drawings (including working drawings and product data) – Submit no fewer than four, three of which will be retained by the Engineer and/or Owner.
    2) Samples – three
    3) Site Usage Plan – three copies
    4) Schedule of values – three copies
    5) Payment application format – three copies
g. If Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, provide written notice thereof to the Engineer immediately; and do not release for manufacture before such notice has been received by the Engineer.
h. When the shop drawings have been completed to the satisfaction of the Engineer, carry out the construction in accordance therewith; and make no further changes therein except upon written instructions from the Engineer.

2. Engineer's Responsibilities
    a. Engineer will not review shop drawings (including working drawings and product data) that do not include the Contractor's approval stamp and required certification statement. Such submittals will be returned to the Contractor, without action, for correction.
    b. Partial shop drawings (including working drawings and product data) will not be reviewed. If, in the opinion of the Engineer, a submittal is incomplete, that submittal will be returned to the Contractor for completion. Such submittals may be returned with comments from Engineer indicating the deficiencies requiring correction.
    c. If shop drawings (including working drawings and product data) meet the submittal requirements, Engineer will forward copies to appropriate reviewer(s). Otherwise, noncompliant submittals will be returned to the Contractor without action - with the Engineer retaining one copy.

d. Submittals which are transmitted in accordance with the specified requirements will be reviewed by the Engineer within the time specified herein. The time for review will commence upon receipt of submittal by Engineer.

3. Review of Shop Drawings (Including Working Drawings and Product Data) and Samples
   a. The review of shop drawings, working drawings, data and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:
      1) As permitting any departure from the Contract requirements
      2) As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials
      3) As approving departures from details furnished by the Engineer, except as otherwise provided herein
   b. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.
   c. If the shop drawings (including working drawings and product data) or samples as submitted describe variations and indicate a deviation from the Contract requirements that, in the opinion of the Engineer are in the interest of the Owner and are so minor as not to involve a change in Contract Price or Contract Time, the Engineer may return the reviewed drawings without noting an exception.
   d. Only the Engineer will utilize the color "RED" in marking submittals.
   e. Shop drawings will be returned to the Contractor with one of the following codes.
      1) Code 1 – "APPROVED" – This code is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.
      2) Code 2 - "APPROVED AS NOTED" - This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
      3) Code 3 - "APPROVED AS NOTED/CONFIRM" - This combination of codes is assigned when a confirmation of the notations and comments is required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This confirmation shall specifically address each omission and nonconforming item that was noted. Confirmation is to be received by the Engineer within 15 calendar days of the date of the Engineer's transmittal requiring the confirmation.
      4) Code 4 - "APPROVED AS NOTED/RESUBMIT" - This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the entire package. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the Engineer within 30 calendar days of the date of the Engineer's transmittal requiring the resubmittal.
      5) Code 5 – "NOT APPROVED" – This code is assigned when the submittal does not meet the intent of the contract documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the contract documents.

6) Code 6 – "COMMENTS ATTACHED" – This code is assigned where there are comments attached to the returned submittal, which provide additional data to aid the Contractor.
7) Code 7 – "RECEIPT ACKNOWLEDGED (Not subject to Engineer's Review or Approval)" – This code is assigned to acknowledge receipt of a submittal that is not subject to the Engineer's review and approval, and is being filed for informational purposes only. This code is generally used in acknowledging receipt of means and methods of construction work plans, field conformance test reports, and health and safety plans.

Codes 1 through 5 designate the status of the reviewed submittal. Code 6 indicates that some or all of the Engineer's comments are included in an attachment.

4. Repetitive Reviews:
   a. Shop drawings, O&M manuals and other submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at times convenient to the Engineer and at the Contractor's expense, based on the Engineer's then prevailing rates. The Contractor shall reimburse the Owner for all costs invoiced by Engineer for the third and subsequent reviews. Submittals are required until approved.
   b. Any need for more than one resubmission, or any other delay in obtaining Engineer's review of submittals, will not entitle Contractor to extension of the Contract time.

5. Electronic Transmission
   a. Action Submittals may be transmitted by electronic means provided the following conditions are met:
      1) The above-specified transmittal form is included.
      2) All other requirements specified above have been met including, but not limited to, coordination by the Contractor, review and approval by the Contactor, and the Contractor's Certification.
      3) The submittal contains no pages or sheets large than 11 x 17 inches.
      4) With the exception of the transmittal sheet, the entire submittal is included in a single file.
      5) The electronic files are PDF format (with printing enabled).
      6) The Engineer's review time will commence upon receipt of the hard copies of the submittal.
      7) For Submittals that require certification, corporate seal, or professional embossment (i.e., P.E.s, Surveyors, etc.) transmit at least three hard-copy originals to the Engineer. In addition, provide additional photocopied or scanned copies, as specified above, showing the required certification, corporate seal, or professional seal.

B. Informational Submittals

1. Contractor's Responsibilities
   a. Number of copies: Submit three copies, unless otherwise indicated in individual Specification sections
   b. Refer to individual technical Specification Sections for specific submittal requirements.

2. Engineer's Responsibilities
   a. The Engineer will review each informational submittal within 15 days. If the informational submittal complies with the Contract requirements, Engineer will file for the project record and transmit a copy to the Owner. Engineer may elect not to respond to Contractor regarding informational submittals meeting the Contract requirements.
   b. If an informational submittal does not comply with the Contract requirements, Engineer will respond accordingly to the Contractor within 15 days. Thereafter, the Contractor shall perform the required corrective action, including retesting, if needed, until the submittal, in the opinion of the Engineer, is in conformance with the Contract Documents.

3. Electronic Transmission
   a. Informational submittals may be transmitted by electronic means providing all of the following conditions are met:
      1) The above-specified transmittal form is included.
      2) The submittal contains no pages or sheets large than 11 x 17 inches.
      3) With the exception of the transmittal sheet, the entire submittal is included in a single file.
      4) The electronic files are PDF format (with printing enabled).
      5) For Submittals that require certification, corporate seal, or professional embossment (i.e., P.E.s, Surveyors, etc.)) transmit two hard-copy originals to the Engineer.

END OF SECTION

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a professional engineer registered in the State of New Mexico and that he/she has been employed by

_____ to design
(Company Name)

_____
(Insert P.E. Responsibilities)

In accordance with Specification Section _____ for the

BuRRT, Water Line and Misting System Improvements.
(Name of Project)

The undersigned further certifies that he/she has performed the said design in conformance with all applicable local, state and federal codes, rules and regulations; and, that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Owner or Owner's representative within seven days following written request therefor by the Owner.

_____	_____
P.E. Name	Company Name
_____	_____
Signature	Signature
_____	_____
P.E. Registration Number	Title
_____	
Address	

SECTION 01310
CONSTRUCTION SCHEDULING

PART 1 GENERAL

1.01 PROGRAM DESCRIPTION

A. A Critical Path Method (CPM) construction schedule shall be used to control the Work and to provide a basis for determining job progress. The construction schedule shall be prepared and maintained by the Contractor. All work shall be done in accordance with the established CPM schedule. The Contractor and all subcontractors shall cooperate fully in developing the construction schedule and in executing the work in accordance with the CPM schedule.

B. The construction schedule shall consist of a computerized CPM network (diagram of activities) presented in a time-scaled graphic (print-out) with reports, as specified herein.

1.02 QUALIFICATIONS

A. The Contractor shall have the capability of preparing and utilizing the specified CPM schedule, or engage the services of a specialized scheduling professional to do so. Within seven days of the award of contract, provide a résumé or qualifications statement for the individual within the Contractor's organization, or the outside consultant, who is being proposed as the responsible party for development and maintenance of the CPM schedule. The résumé or qualifications statement shall demonstrate that the proposed responsible party has successfully developed and maintained CPM schedules for at least three construction projects of the same size or greater than this project. The proposed responsible party for the CPM schedule is subject to approval by the Engineer and Owner. If the proposed responsible party for the CPM schedule is not approved by the Engineer and/or Owner, Contractor shall resubmit a more-appropriate candidate for approval.

1.03 SUBMITTALS

A. Contractor shall submit Interim, Preliminary, Baseline (also known as "as-planned") CPM schedules, revisions, and Monthly Status Reports, all including graphics, reports, and narratives, and an as-built schedule, as specified herein.

PART 2 PRODUCTS

2.01 SOFTWARE

A. Unless otherwise approved by the Engineer, the computer-based schedule shall be generated using Oracle-Primavera Contractor, or P6 Professional Project Management Software.

2.02 NETWORK REQUIREMENTS

A. Each schedule submittal shall contain the following identifying information:

1. Project Title, Owner's Contract Number, and the Engineer's Project Number

2. Contractor's name

3. All Contract milestones, as specified

4. The project calendar(s) (including work week and holidays)

5. Type of submittal (e.g., Interim, Preliminary, Baseline or Monthly Status Report)

6. A summary contract milestones

7. Data date and run (print) date

B. The network of activities shall show the order and inter-dependence of activities; and, show the sequence in which the work is to be accomplished, as planned by the Contractor. The basic concept of a network analysis diagram shall be followed to show how each activity is dependent on preceding activities (predecessors) and following activities (successors).

C. Detailed network activities shall include, but are not limited to,:

1. mobilization activities,

2. procurement activities (submittals, review and approval, fabrication, and delivery),

3. permitting and regulatory activities,

4. construction activities (including demolition, rehabilitation, new construction and testing),

5. maintenance of existing facilities,

6. test and start-up activities (including testing, start-up, training, performance testing, and commissioning),

7. contract milestones (fixed and floating),

8. specified sequences, outages and coordination activities, and

9. any other activities needed to properly identify the scope of work and contract requirements.

D. All activities shall be sufficiently identified and/or described so that the scope of work of each activity is clear. All work tasks shall be broken down into appropriate scopes and durations to facilitate monitoring progress. Unless otherwise approved by the Engineer, no activities shall have durations of more than one month; except for off-site activities such as procurement and delivery of materials and equipment - or administrative or management activities that span the project duration that do not reflect earned progress.

E. Network activities shall be organized (grouped) by phases (or stages), physical areas, buildings, elevations, or other portions of the project.

F. Separate network activities shall be provided for each significant identifiable function in each trade area in each facility. Separate network activities shall be provided for subcontractors.

G. The number of network activities, sufficiency of description, and level of breakdown shall be subject to the Engineer's review and approval to confirm conformance with the specified requirements.

H. The format of the schedule network graphic shall be a time-scaled logic diagram - with a list of network activities and the specified data fields presented adjacent to the graphic display.

I. The following general requirements also apply to the network diagram.

1. The Critical Path (the sequence of project network activities that add up to the longest overall duration and thereby determines the shortest time possible to complete the project) shall be identified - preferably in 'red'.

2. Unless otherwise approved by the Engineer the Contractor's work schedule shall be based on 'normal work week' as defined in the Contract Documents – (typically 40 hours per week, consisting of five 8-hour days).

3. The graphics shall indicate the calendar(s) on which activity durations are based (i.e., 5-day workweek or 7 calendar day week). When multiple calendars or work weeks are used, the graphics shall clearly indicate which calendars are used where.

4. The project calendar shall include exclusions for holidays observed by the Contractor and those indicated in the Contract Documents.

J. Each network activity shall have the following information (fields) listed alongside the activity on the graphic display.

1. Activity ID – a manually assigned designation (numeric or alphanumeric). The Contractor should use a logical approach to assigning identification to network activities to facilitate grouping (sorting) of activities.

2. Activity Description

3. Original Duration – including allowances for adverse weather interruptions – normal for the project location. Normal weather shall mean seasonally average weather conditions, as recorded by NOAA.

4. Percent complete – the Contractor's estimated percent complete for each network activity as of the data date for the respective report.

5. Remaining Duration - a calculated value based on Original Duration of each network activity and the estimated percent of completion for each activity.

6. Early Start Date

7. Early Finish Date

8. Late Start Date

9. Latest Finish Date

10. Total Float

2.03 SUBMITTAL REQUIREMENTS

A. Each schedule submittal shall include the following elements:

1. Graphics – unless otherwise approved by the Engineer, the network graphics shall be printed on 24-inch by 36-inch sheets; including a list of activities and the specified data fields.

2. Narrative
   a. The Narrative shall consist of a written report by the Contractor providing an overview of the schedule – specific to each submittal.
   b. The Narratives for developmental submittals, i.e., Interim and Preliminary, shall describe the Contractor's approach to executing the project Work.
   c. The Narrative for the Baseline Schedule shall:
      1) Explain key activities and assumptions on which the schedule is based;
      2) Describe the Critical Path;
      3) Discuss key deliveries that might adversely affect the project schedule; and,
      4) Explain the Contractor's approach to adverse weather interruptions – normal for the project location. Normal weather shall mean seasonally average weather conditions, as recorded by NOAA.
   d. The Narratives provided with Monthly Status Reports (updates) shall also identify:
      1) Any changes the Contractor has made to the CPM logic (including any added, modified or deleted activities,
      2) Any delays that have been encountered, and
      3) Remedial actions or recovery steps the Contractor will employ to arrest and/or recover from such delays.

B. Reports

1. The following reports are required to be submitted with Baseline Schedule, when a major revision is made to the schedule, and when requested by the Engineer.
   a. Activity – a report listing all network activities, sorted by activity ID
   b. Early Start – a report listing all network activities, sorted by Early Start date
   c. Total Float – a report listing all network activities, sorted by Total Float (ascending from low to high).
   d. Predecessor/Successor – a report of all activities, sorted by Activity ID that lists all predecessor and successor activities for each network activity.

2.04 ACCEPTABILITY

A. The Contractor shall submit the CPM schedule submittals, as specified, and resubmit as needed, until they are in compliance with Contract requirements.

B. The Engineer's review of the Contractor's construction schedule submittals will only be for conformance with the Contract requirements – including but not limited to contract time and work sequences specified in the contract documents. The Engineer's review of the schedule shall not include the Contractor's means and methods of construction or safety. The Engineer's concurrence, acceptance, or approval of the Contractor's schedule submittals will not relieve the Contractor from responsibility for complying with the Contract Scope, Contract Time or any

other contract requirement. Any indication of concurrence, acceptance, or approval of the Contractor's schedule will only indicate a general conformance with the Contract Requirements.

C. Engineer's review of the Contractor's construction schedule submittals shall not relieve the Contractor from responsibility for any deviations from the Contract Documents unless the Contractor has in writing called Engineer's attention to such deviations at the time of submission and Engineer has given written concurrence to the specific deviations, nor shall any concurrence by the Engineer relieve Contractor from responsibility for errors and omissions in the submittals. Concurrence of the CPM Activity Network by the Engineer is advisory only and shall not relieve the Contractor of responsibility for accomplishing the Work within the Contract completion date(s).

D. Concurrence, acceptance, or approval of the Contractor's CPM schedule by the Engineer in no way makes the Engineer an insurer of the CPM schedule's success, nor liable for time or cost overruns resulting therefrom.

E. Failure to include any element of work required for the performance of this Contract will not excuse the Contractor from completing all Work required within the Contract completion date(s), notwithstanding the review of the network by the Engineer.

F. CPM schedules that contain activities with negative float, or which extend beyond the contract completion date, will not be acceptable.

G. Except where earlier completions are specified, CPM schedules which show completion of all work prior to the contract completion date may be indicated; however, in no event shall they constitute a basis for claim for delay by the Contractor.

PART 3 EXECUTION

3.01 IMPLEMENTATION SCHEDULE

A. Interim Schedule

1. Within 5 working days following the receipt of the Notice to Proceed, submit an Interim Schedule indicating the planned operations during the first 60 calendar days after Notice to Proceed. In addition, the Contractor shall indicate its general approach for the balance of the project.

2. While the Preliminary schedule is being developed, the Contractor shall update the Interim schedule on a monthly basis – indicating actual progress - until the Preliminary schedule is submitted.

B. Preliminary Schedule

1. Within 5 days following the receipt of Notice to Proceed, submit a proposed Preliminary Schedule to the Engineer. The Preliminary Schedule shall consist of a draft computer-generated CPM-schedule showing the entire Scope of Work. The Preliminary Schedule shall not include any actual progress earned during development of the schedule (i.e., statused as of the Notice to Proceed).

2. Within 5 days of submittal of the Preliminary Schedule meet with the Engineer to discuss the review comments.

3. Once the Preliminary Schedule is submitted, Contractor shall discontinue updating the Interim Schedule. Provide monthly updates of the Preliminary Schedule until concurrence, acceptance, or approval of the Baseline Schedule.

C. Baseline (as-planned) Schedule

1. Within 10 days of the review meeting on the Preliminary Schedule submittal, the Contractor shall incorporate the Engineer's comments into the network and submit a Baseline Schedule. Resubmit the Baseline Schedule, as required until it is deemed acceptable as stated in paragraph 2.04, above.

2. Upon concurrence, acceptance, or approval of the Contractor's initial Baseline Schedule, statused as of the Notice to Proceed date, it shall be recognized as the basis against which the Contractor's progress shall be measured.

D. Monthly Status Reports

1. Monthly Status Reports shall include updated graphics and a narrative. In addition, if requested by the Engineer, Contractor shall provide copies of one or more of the standard reports listed in 2.03.B.

2. The Contractor shall provide Monthly Status Reports (schedule updates) commencing approximately 30 days after submission of the Interim Schedule. Unless approved otherwise by the Engineer, the Monthly Status Reports shall be statused as of the end of each calendar month.

3. While the Preliminary Schedule is being developed, the Contractor shall update the Interim schedule on a monthly basis – indicating actual progress - until the Preliminary Schedule is submitted.

4. While the Baseline Schedule is being developed, the Contractor shall update the Preliminary Schedule on a monthly basis – indicating actual progress - until concurrence, acceptance, or approval of the Baseline Schedule.

5. Once the initial Baseline Schedule is complete, Monthly Status Reports shall be based on the Baseline Schedule.

E. As-Built Schedule

1. Upon achieving Substantial Completion, the Contractor shall submit an as-built schedule, showing all activities from the Notice to Proceed through Substantial Completion. In addition, provide the reports listed in 2.03.B. A Narrative is not required.

3.02 DELIVERABLES

A. Unless approved otherwise by the Engineer, all schedule submittals shall be printed in color on sheets 11-in by 17-in and may be divided into as many separate sheets as required.

B. Interim Schedule: Submit three copies to the Engineer.

C. Preliminary Schedule: Submit three hard (paper) copies to the Engineer.

D. Baseline Schedule: Submit three hard (paper) copies, one electronic copy (PDF), and a copy of the program files to the Engineer.

E. Monthly Status Reports: Submit three copies and one electronic copy on CD to the Engineer; and if requested, an electronic copy of the program files for the respective update.

F. As-Built Schedule: Submit one hard copy; one electronic (PDF), and, if requested, an electronic copy of the program files.

3.03 PROGRESS REPORTING

A. Progress under the approved CPM schedule shall be reported monthly by the Contractor by submitting a Monthly Status Report. Unless otherwise approved by the Engineer, not less than seven days prior to the due date of the Monthly Status Report, the Contractor shall meet with the Engineer 's representative to jointly evaluate the status of each network activity. Each activity shall be updated to reflect the actual progress (percent complete) and the actual dates activities were started and completed, as applicable.

B. The Monthly Status Report shall include an update of the computer-generated network graphics and a Narrative report. The Narrative shall include:

1. A description of the progress during the reporting period in terms of completed activities

2. A summary of the Critical Path

3. A description or explanation of each delays to network activities

4. A description of problem areas, current and anticipated delaying factors and their anticipated effect on the performance of other activities and completion dates

5. An explanation of corrective action taken or proposed.

6. This report, as well as the CPM Status Report, will be discussed at each progress meeting.

3.04 RESPONSIBILITY FOR SCHEDULE COMPLIANCE

A. Whenever it becomes apparent from the current CPM schedule and CPM Status Report that delays to the critical path have resulted and the contract completion date will not be met, or when so directed by the Engineer take some or all of the following actions at no additional cost to the Owner. Submit to the Engineer for approval, a written statement of the steps intended to take to remove or arrest the delay to the critical path in the approved schedule.

1. Increase construction manpower in such quantities and crafts,

2. Increase the number of working hours per shift, shifts per day, working days per week,

3. Increase the amount of construction equipment, and/or

4. Reschedule activities to maximize the concurrence of activities and comply with the revised schedule.

B. If when so requested by the Engineer, failure to submit a written statement of the steps intended to take or should fail to take such steps as approved by the Engineer, the Engineer may direct the Contractor to increase the level of effort in man-power (trades), equipment and work schedule (overtime, weekend and holiday work, etc) to be employed by the Contractor in order to remove or arrest the delay to the critical path in the approved schedule and the Contractor shall promptly provide such level of effort at no additional cost to the Owner.

3.05 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME

A. If the Contractor wants or needs to make changes in his/her execution of the construction schedule that would affect the approved CPM schedule, he/she shall notify the Engineer in writing stating what changes are proposed and the reasons for the changes. If the Engineer approves such changes, the Contractor shall revise and submit a revised schedule for approval - without additional cost to the Owner. The CPM schedule shall be adjusted by the Contractor only after prior approval of his/her proposed changes. Adjustments may consist of changing portions of the activity sequence, activity durations, division of approved activities, or other adjustments as may be approved by the Engineer; however, the addition of extraneous, non-working activities and activities that add unapproved restraints to the CPM schedule will not be allowed.

B. Shop drawings that are not approved on the first submittal will require the addition of network activities for the resubmittals.

C. Equipment that does not pass the specified tests will require the addition of network activities for the retesting.

D. The contract completion time will be adjusted only for causes specified in this Contract. In the event the Contractor requests an extension of any contract completion date, he/she shall furnish such justification and supporting evidence as the Engineer may deem necessary to determine whether the Contractor is entitled to an extension of time under the provisions of this Contract. After receipt of such justification and supporting evidence, the Engineer shall perform an assessment or evaluation of the appropriate change in contract time based upon the currently approved CPM schedule and on all data relevant to the extension. Inexcusable delays (attributable to the Contractor) and non-critical delays (delays to activities which, according to the CPM schedule, do not affect any contract completion date shown by the Critical Path) shall not be the basis for a change in contract time. The Engineer will provide a written recommendation to the Owner based on its assessment, with a copy to the Contractor. The Contractor shall not change any fixed contract milestones or required completion dates without the approval of the Owner, evidenced by the execution of a contract change order. However, the Contractor should make note of such requests for changes in contract time in the narrative of monthly schedule status reports.

E. Each request for change in any contract completion date shall be submitted by the Contractor to the Engineer in accordance with the notification requirements stipulated in the form of contract or general conditions. No time extension will be granted for requests that are not submitted in accordance with the Contract requirements.

F. Total float in the approved CPM network belongs to the project; i.e., either the Owner or Contractor may take advantage of available total float on a first-come, first-served basis. Therefore, without obligation to extend either the overall completion date, or any intermediate completion dates set out in the CPM network, the Owner may initiate changes to the work or delay work that absorb available total float existing at the time of the change or delay. Owner initiated changes or delays that affect the Critical Path on the approved CPM network shall be the sole grounds for extending (or contracting) contract completion dates or fixed milestones.

END OF SECTION

This Page Intentionally Left Blank

SECTION 01370
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit a Schedule of Values (a breakdown of the bid) allocated to the various portions of the work, within 10 days of receipt of the Notice to Proceed.

B. Upon request of the Engineer, support the values with data which will substantiate their correctness.

C. The accepted Schedule of Values shall be used only as the basis for the Contractor's Applications for Payment.

1.02 RELATED REQUIREMENTS

A. Standard General Conditions of the Construction Contract are included in Section 11 of the Contract Documents.

1. Application for Payment is included in Section 01026.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Type schedule on an 8-1/2-in by 11-in or 8-1/2-in by 14-in white paper furnished by the Owner; Contractor's standard forms and automated printout will be considered for approval by the Engineer upon Contractor's request. Identify schedule with:

1. Title of Project and location.

2. Engineer and Project number.

3. Name and Address of Contractor.

4. Contract designation.

5. Date of submission.

B. Schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.

C. Identify each line item with the number and title of the respective Section.

D. For each major line item list sub-values of major products or operations under the item.

E. For the various portions of the work:

1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

2. For items on which progress payments will be requested for stored materials, break down the value into:
   a. The cost of the materials, delivered and unloaded, with taxes paid. Paid invoices are required for materials upon request by the Engineer.
   b. The total installed value.

F. The sum of all values listed in the schedule shall equal the total Contract Sum.

1.04 SUBSCHEDULE OF UNIT MATERIAL VALUES

A. Submit a sub-schedule of unit costs and quantities for:

1. Products on which progress payments will be requested for stored products.

B. The form of submittal shall parallel that of the Schedule of Values, with each item identified the same as the line item in the Schedule of Values.

C. The unit quantity for bulk materials shall include an allowance for normal waste.

D. The unit values for the materials shall be broken down into:

1. Cost of the material, delivered and unloaded at the site, with taxes paid.

2. Copies of invoices for component material shall be included with the payment request in which the material first appears.

3. Paid invoices shall be provided with the second payment request in which the material appears or no payment shall be allowed and/or may be deleted from the request.

E. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies administrative, verification and procedural requirements for project closeout, including but not limited to:

1. Final cleaning Section 01710.

2. Project Record Documents Section 01720.

3. Warranties and Bonds Section 01740 and applicable Sections in the Technical Specifications Divisions 2 through 16.

4. Reconciliation of final accounting, final change order, final payment application (General Conditions, Section 00710) and Contractor's releases.

5. Permit close-outs including Certificate of Occupancy or Certificate of Completion.

1.02 CLOSEOUT PROCEDURES

A. Provide all deliverables as specified, prior to submitting the final payment application.

B. Provide submittals to Engineer that are required by governing or other authorities having applicable jurisdiction including but not limited to permit close out information, certificates of occupancy, etc.

C. Submit Application for Final Payment identifying total adjusted Contract Sum, previous payments and sum remaining due, following submittal and approval of Record Documents and Record Drawings.

D. Submit Contractor's Final Release and Release of Liens with final payment application.

1.03 FINAL CLEANING

A. Contractor to complete final cleaning prior to submittal of the final application for payment.

B. Contractor to comply with requirements as specified in Section 01710.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

This Page Intentionally Left Blank

SECTION 01710
CLEANING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. CONTRACTOR shall execute cleaning, during progress of the Work, and at completion of the Work.

1.02 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

A. Execute daily cleaning to keep the Work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.

B. Provide onsite containers for the collection of waste materials, debris and rubbish. All waste materials including containers, food debris and other miscellaneous materials must be disposed of daily in onsite containers.

C. Waste materials, debris and rubbish from the construction site shall be separated and stored on site in an approved area.

3.02 FINAL CLEANING

A. Employ skilled workmen for final cleaning.

B. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

C. Prior to substantial completion, or OWNER acceptance, CONTRACTOR shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire Work is clean.

END OF SECTION

This Page Intentionally Left Blank

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SCOPE

A. The Contractor shall keep and maintain, at the job site, a copy of contract documents, marked up to indicate all changes made during the course of a project, as specified herein.

1.02 RELATED REQUIREMENTS

A. Contract close-out submittals are included in Section 01700.

B. Warranties and bonds are included in Section 01740.

C. As-built construction schedules are included in Section 01310.

1.03 REQUIREMENTS INCLUDED

A. Contractor shall maintain a record copy of the following documents, marked up to indicate all changes made during the course of a project:

1. Contract Drawings

2. Specifications

B. Contractor shall assemble copies of the following documents for turnover to the Engineer at the end of the project, as specified.

1. Field Orders, Change Orders, Design Modifications, and RFIs

2. Field Test records

3. Permits and permit close-outs (final approvals)

4. Certificate of Occupancy or Certificate of Completion, as applicable

5. Laboratory test reports (e.g., bacteriological and primary & secondary water quality)

6. Certificates of Compliance for materials and equipment

C. RECORD DRAWINGS

1. The Contractor shall annotate (mark-up) the Contract Drawings to indicate all project conditions, locations, configurations, and any other changes or deviations that vary from the original Contract Drawings. This requirement includes, but is not limited to, buried or concealed construction, and utility features that are revealed during the course of construction. Special attention shall be given to recording the locations (horizontal and vertical) and material of all buried utilities that are encountered during construction – whether or not they were indicated on the Contract Drawings. The record information

added to the drawings may be supplemented by detailed sketches, if necessary, clearly indicating, the WORK, as constructed.

2. These annotated Contract Drawings constitute The Contractor's Record Drawings and are actual representations of as-built conditions, including all revisions made necessary by change orders, design modifications, requests for information and field orders.

3. Record drawings shall be accessible to the Owner and Engineer at all times during the construction period.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office apart from documents used for construction.

1. Provide files and racks for storage of the record documents.

2. Provide locked cabinet(s) or secure storage space for storage of samples.

B. File documents and samples in accordance with Construction Specifications Institute (CSI) format.

C. Maintain documents in a clean, dry, legible, condition and in good order. Do not use record documents for construction purposes.

D. Make documents and sample available for inspection by the Engineer or Owner at all times.

3.02 MARKING METHOD

A. Use the color Red (indelible ink) to record information on the Drawings and Specifications,

B. Label each document "PROJECT RECORD" in neat large printed letters.

C. Unless otherwise specified elsewhere, notations shall be affixed to hardcopies of documents.

D. Record information contemporaneously with construction progress.

E. Legibly mark drawings with as-built information:

1. Elevations and dimensions of structures and structural elements.

2. All underground utilities (piping and electrical), structures, and appurtenances
   a. Changes to existing structure, piping and appurtenance locations.
   b. Record horizontal and vertical locations of underground structures, piping, utilities and appurtenances, referenced to permanent surface improvements.
   c. Record actual installed pipe material, class, size, joint type, etc

3.03 RECORD INFORMATION COMPILATION

A. Do not conceal any work until the required information is acquired.

B. Items to be recorded include, but are not limited to:

1. Location of internal utilities and appurtenances concealed in the construction – referenced to visible and accessible features.

2. Field changes of dimensions and/or details
   a. Interior equipment and piping relocations.
   b. Architectural and structural changes, including relocation of doors, windows, etc.
   c. Architectural schedule changes.

C. Changes made by Field Order, Change Order, design modification, and RFI.

D. Details not indicated on the original Contract Drawings.

3.04 SUBMITTAL

A. If specified under the section for progress payments, monthly applications for payment will be contingent upon up-to-date Record Drawings. If requested by the Engineer or Owner, Contractor shall provide a copy of the Record Drawings, or present them for review prior to processing monthly applications for payment.

B. Upon substantial completion of the WORK and prior to final acceptance, the Contractor shall finalize and deliver a complete set of Record Drawings to the ENGINEER conforming to the construction records of the Contractor. The set of drawings shall consist of corrected and annotated drawings showing the recorded location(s) of the WORK. Unless specified otherwise elsewhere, Record Drawings shall be in the form of a set of prints with annotations carefully and neatly superimposed on the drawings in red.

C. Upon substantial completion of the WORK and prior to final acceptance, the Contractor shall finalize and deliver a complete set of Record Documents to the ENGINEER conforming to the construction records of the Contractor. The set of documents shall consist of corrected and annotated documents showing the as-installed equipment and all other as-built conditions not indicated on the Record Drawings.

D. The information submitted by the Contractor into the Record Drawings and Record Documents will be assumed to be correct, and the Contractor shall be responsible for the accuracy of such information, and shall bear the costs resulting from the correction of incorrect data.

E. Delivery of Record Drawings and Record Documents to the ENGINEER will be a prerequisite to Final payment.

F. The Contractor shall maintain a copy of all books, records, and documents pertinent to the performance under this Agreement for a period of five years following completion of the contract.

END OF SECTION

This Page Intentionally Left Blank

SECTION 01730
OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes procedural requirements for compiling and submitting operation and maintenance data required to complete the project.

1.02 RELATED WORK

A. Submittals are included in Section 01300.

B. Contract closeout is included in Section 01700.

C. Warranties and Bonds are included in Section 01740.

1.03 OPERATING MANUALS

A. Provide specific operation and maintenance instructions for all electrical, mechanical, and instrumentation & controls equipment furnished under various technical specifications Sections.

B. Separate manuals shall be provided for each type of equipment, or each Section number. Each manual shall contain the following:

1. Format and Materials
    a. Binders:
        1) Commercial quality three ring binders with durable and cleanable plastic covers
        2) Maximum ring width capacity: 3 inches
        3) When multiple binders are used, correlate the data into related consistent groupings/volumes.
    b. Identification: Identify each volume on the cover and spine with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". Include the following:
        1) Title of Project.
        2) Identify the general subject matter covered in the manual.
        3) Identify structure(s) and/or location(s), of the equipment provided.
        4) Specification Section number.
    c. 20 lb loose leaf paper, with hole reinforcement
    d. Page size: 8-1/2 inch by 11 inch
    e. Provide heavy-duty fly leafs (section separators), matching the table of contents, for each separate product, each piece of operating equipment, and organizational sections of the manual.
    f. Provide reinforced punched binder tab; bind in with text.
    g. Reduce larger drawings and fold to the size of text pages - but not larger than 11 inches x 17 inches - or provide a suitable clear plastic pocket (with drawing identification) for such folded drawings/diagrams.

2. Contents:
    a. A table of contents/Index, divided into section reflective of the major components provided.

b. Specific description of each system and components
c. Name, address, telephone number(s) and e-mail address(es) of vendor(s) and local service representative(s)
d. Specific on-site operating instructions (including starting and stopping procedures)
e. Safety considerations
f. Project specific operational procedures and recommended log sheet(s).
g. Project specific maintenance procedures
h. Manufacturer's operating and maintenance instructions – specific to the project
i. Copy of each wiring diagram
j. Copy of approved shop drawing(s) and Contractor's coordination/layout drawing(s)
k. List of spare parts and recommended quantities
l. Product Data: Mark each sheet to clearly identify specific products and component parts and data applicable to installation. Delete inapplicable information.
m. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams
n. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified.
o. Warranties and Bonds, as specified in the General Conditions

3. Transmittals
   a. Prepare separate transmittal sheets for each manual. Each transmittal sheet shall include at least the following: the Contractor's name and address, Owner's name, project name, project number, submittal number, description of submittal and number of copies submitted.
   b. Submittals shall be transmitted or delivered directly to the office of the Engineer, as indicated in the Contact Documents or as otherwise directed by the Engineer.
   c. Provide copies of transmittals (only, i.e., without copies of the respective submittal) directly to the Resident Project Representative.

C. Manuals for Equipment and Systems - In addition to the requirements listed above, for each System, provide the following:

1. Overview of system and description of unit or system and component parts. Identify function, normal operating characteristics and limiting conditions. Include legible performance curves, with engineering data and tests and complete nomenclature and commercial number of replaceable parts.

2. Panelboard circuit directories including electrical service characteristics, controls and communications and color-coded wiring diagrams as installed.

3. Operating procedures: include start-up, break-in and routine normal operating instructions and sequences; regulation, control, stopping, shut-down and emergency instructions; and summer, winter and any special operating instructions.

4. Maintenance Requirements
   a. Procedures and guides for trouble-shooting; disassembly, repair, and reassembly instructions
   b. Alignment, adjusting, balancing and checking instructions
   c. Servicing and lubrication schedule and list of recommended lubricants
   d. Manufacturer's printed operation and maintenance instructions

e. Sequence of operation by instrumentation and controls manufacturer
f. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance

5. Control diagrams by controls manufacturer as installed (as-built)

6. Contractor's coordination drawings, with color coded piping diagrams, as installed (as-built)

7. Charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams. Include equipment and instrument tag numbers on diagrams.

8. List of original manufacturer's spare parts and recommended quantities to be maintained in storage

9. Test and balancing reports, as required

10. Additional Requirements as specified in individual product specification

11. Design data for systems engineered by the Contractor or its Suppliers

D. Electronic Transmission of O&M Manuals

1. Unless otherwise approved by the Engineer, O&M manuals may not be transmitted by electronic means other than by CD-ROM or USB flash drive. Electronic O&M manuals shall meet the following conditions:
   a. The above-specified transmittal form is included.
   b. All other requirements specified above have been met, including, but not limited to, coordination by the Contractor, review and approval by the Contactor.
   c. The submittal contains no pages or sheets large than 11 x 17 inches.
   d. With the exception of the transmittal sheet, the entire submittal is included in a single file.
   e. Files are Portable Document Format (PDF) – with the printing function enabled.
   f. All scanned manufacturer's O&M manuals must be quality checked after scanning to ensure the page are not crooked and all information is legible.

2. When electronic copies are provided, transmit two hard copy (paper) originals to the Engineer with an electronic copy on CD-ROM.

3. The electronic copy of the O&M manual must be identical in organization, format and content to the hard copies of the manual.

4. The electronic O&M Manual must be bookmarked identically to the paper manual table of contents to allow quick access to information. Electronic submittals that require extensive scrolling will not be accepted. The document must be indexed and searchable.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTAL SCHEDULE

A. Operation and maintenance manuals shall be delivered directly to the office of the Engineer, as follows:

1. Provide preliminary copies of each manual to the office of the Engineer, no later than 30 days following approval of the respective shop drawings.

2. Provide final copies of each completed manual prior to testing.

3. Provide a letter that grants the Engineer and Owner to the limited right to use and reproduce each manual (in it its entirety or any portion thereof) from the respective equipment manufacturer(s). Such limited right shall allow the Engineer and Owner to use each manual or and portion thereof for:
   a. The potential assembly of a comprehensive facility operation and maintenance manual for the sole benefit of the Owner; and,
   b. supplemental training of the Owner's personnel and operators, over and above the required vendor's training, regarding operation of the facility as a system.

B. The ENGINEER will review Operation and Maintenance manuals submittals for operating equipment for conformance with the requirements of the applicable specification Section. The review will generally be based on the O&M Manual Review Checklist appended to this Section.

C. If during test and start-up of equipment, any changes were made to the equipment, provide two hard copies of as-built drawings or any other amendments for insertion, by the contractor, in the previously transmitted final manuals. In addition, provide one revised electronic version including the as-built drawings and any other amendments. The manuals shall be completed, including updates, if any, within 30 days of start-up and testing of the facility.

3.02 VENDOR TRAINING/INSTRUCTIONS (TO OWNER'S PERSONNEL)

A. Before final initiation of operation, Contractor's vendors shall train/instruct Owner's designated personnel in the operation, adjustment, and maintenance of products, equipment and systems at times convenient to the Owner.

B. Unless specified otherwise under the respective equipment specification section, vendor training/instruction shall consist of eight hours of training for each type of equipment. Such training/instruction shall be scheduled and held at times to accommodate the work schedules of Owner's personnel, including splitting the required training/instruction time into separate sessions and/or presented at reasonable times other than the Contractor's "normal working hours" or the Owner's normal day shift.

C. Use operation and maintenance manuals as basis for instruction. Train/instruct the Owner's personnel, in detail, based on the contents of manual explaining all aspects of operation and maintenance of the equipment. If the respective equipment is inter-related to the operation of other equipment, all interlock, constraints, and permissives shall be explained.

D. At least two weeks prior to the schedule for vendor training, a detailed lesson plan, representative of the material to be covered during instruction, shall be submitted to the Engineer for approval. Lesson plans shall consist of in-depth outlines of the training material, including a table of contents, resume of the instructor, materials to be covered, start-up procedures, maintenance requirements, safety considerations, and shut-down procedures.

E. Prepare and insert additional data in each Operation and Maintenance Manual when the need for such data becomes apparent during training/instruction.

F. Vendor's training/instruction will be considered acceptable based on the completed Owner's Acknowledgement of Manufacturer's Instruction as indicated on the Equipment Manufacturer's Certification of Installation, Testing, and Instruction appended to this Section.

3.03 VIDEOGRAPHY OF VENDOR TRAINING/INSTRUCTION

A. Audio/video (A/V) record (in DVD format) training/instructions as they are being provided to the Owner's personnel. Such recording shall include the entire training/instruction session(s) as well as all questions and answers. A/V recording shall be performed by a professional organization experienced in the production of such recordings. Self-recording by the Contractor may be considered, provided that Contractor can demonstrate, in advance, proficient examples of such recordings.

B. To avoid audio problems, training/instruction shall be held in a location sufficiently removed from construction activity, insulated from the noise of construction activity, or during a time when construction activity is not occurring in the vicinity.

C. The audio portion of the A/V recording should be done with a microphone (wired or wireless) attached to the trainer/instructor to maximize the quality of speech.

D. Each A/V recording should have "chapters" to segregate the distinct portions of the training/instruction, or have visual cues at the start of a change in subject.

E. Two copies of the A/V recordings shall be submitted to the Engineer on DVD disk(s). The DVDs will become the property of the Owner.

END OF SECTION

This Page Intentionally Left Blank

O&M Manual Review Checklist

Submittal No.: _____

Project No.: _____

Manufacturer: _____

Equipment Submitted: _____

Specification Section: _____

Date of Submittal: _____

	General Data	
1.	Are the area representative's name, address, e-mail address and telephone number included?	
2.	Is the nameplate data for each component included?	
3.	Are all associated components related to the specific equipment included?	
4.	Is non-pertinent data crossed out or deleted?	
5.	Are drawings neatly folded and/or inserted into packets?	
6.	Are all pages properly aligned and scanned legibly?	
7.	Is the .PDF document bookmarked according to the table of contents?	
	Operations and Maintenance Data	
8.	Is an overview description of the equipment and/or process included?	
9.	Does the description include the practical theory of operation?	
10.	Does each equipment component include specific details (design characteristics, operating parameters, control descriptions, and selector switch positions and functions)?	
11.	Are alarm and shutdown conditions specific to the equipment provided on this project clearly identified? Does it describe possible causes and recommended remedies?	
12.	Are step procedures for starting, stopping, and troubleshooting specific to the equipment provided included?	
13.	Is a list of operational parameters to monitor and record specific to the equipment provided included?	
14.	Is a proposed operating log sheet specific to the equipment provided included?	
15.	Is a spare parts inventory list included for each component?	
16.	Is a lubrication schedule for each component specific to the equipment provided included - or does it clearly state "No Lubrication Required"?	
17.	Is a maintenance schedule for each component specific to the equipment provided included?	
18..	Is a copy of the warranty information included?	

Review Comments

Is the submittal fully approved (yes/no)? _____

If not, the following points of rejection must be addressed and require resubmittal by the Contractor:

Item No.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14, _____
15. _____

Reviewed By: _____ Date: _____

Legend

1 = OK

2 = Not Adequate

3 = Not Included

Note: This submittal has been reviewed for compliance with the Contract Documents.

SECTION 01740
WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1.02 RELATED WORK

A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.

B. General closeout requirements are included in Section 01700 Project Closeout.

C. Specific requirements for warranties for the work and products and installations that are specified to be warranted are included in the individual Sections.

1.03 SUBMITTALS

A. Submit written warranties to the Owner prior to the date fixed by the Engineer for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the work, or a designated portion of the work, submit written warranties upon request of the Owner.

B. When a designated portion of the work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner within 15 days of completion of that designated portion of the Work.

C. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner for approval prior to final execution.

D. Refer to individual Sections for specific content requirements, and particular requirements for submittal of special warranties.

E. At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

F. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents and sized to receive 8-1/2-in by 11-in paper.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the Section in which specified and the name of the product or work item.

H. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of the installer, supplier and manufacturer.

I. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the project title or name and the name, address and telephone number of the equipment supplier.

1.04 WARRANTY REQUIREMENT

A. Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.

B. Reinstatement of Warranty: When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the contract Documents.

F. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers and subcontractors required to countersign special warranties with the Contractor.

1.05 MANUFACTURERS CERTIFICATIONS

A. Where required, the Contractor shall supply evidence, satisfactory to the Engineer, that the Contractor can obtain manufacturers' certifications as to the Contractor's installation of equipment.

1.06 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

This Page Intentionally Left Blank

SECTION 05500
MISCELLANEOUS METALS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install all miscellaneous metal complete as shown on the Drawings and as specified herein.

1.02 SUBMITTALS

A. Submit, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:

1. Shop drawings, showing sizes of members, method of assembly, anchorage and connection to other members.

1.03 REFERENCE STANDARDS

A. ASTM International (ASTM):

1. ASTM A36 - Standard Specification for Carbon Structural Steel.

2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

3. ASTM A108 - Standard Specification for Steel Bars, Carbon, Cold Finished, Standard Quality.

4. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

5. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

6. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.

7. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 Psi Tensile Strength.

8. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

9. ASTM A570 - Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.

10. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

11. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

12. ASTM F594 - Standard Specification for Stainless Steel Nuts.

13. ASTM F1554 -Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

14. ASTM F2329 - Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon Screws, Washers, Nuts, and Special Threaded Fasteners.

B. American Institute of Steel Construction (AISC):

1. Specification for Structural Steel Buildings – Allowable Stress Design and Plastic Design.

C. American Welding Society (AWS):

1. AWS D1.1 - Structural Welding Code - Steel.

2. AWS D1.2 - Structural Welding Code - Aluminum.

3. AWS D1.6 - Structural Welding Code - Stainless Steel

D. Federal Specifications:

1. FS-FF-B-575C - Bolts, Hexagonal and Square.

E. Occupational Safety and Health Administration (OSHA).

F. International Code Council (ICC):

1. International Building Code (IBC).

G. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.04 QUALITY ASSURANCE

A. The work of this Section shall be completely coordinated with the work of other Sections. Verify, at the site, both the dimensions and work of other trades adjoining items of work in this Section before fabrication and installation of items herein specified.

B. Furnish to the pertinent trades all items included under this Section that are to be built into the work of other Sections.

C. All welding shall be performed by qualified welders and shall conform to the applicable AWS welding code. Welding of steel shall conform to AWS D1.1 and welding of aluminum shall conform to AWS D1.2 and welding of stainless steel shall conform to AWS D1.6.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver items to be incorporated into the work of other trades in sufficient time to be checked prior to installation.

B. Store materials on skids and not on the ground and block up so that they will not become bent or otherwise damaged. Handle materials with cranes or derricks. Do not dump material off cars or trucks nor handle in any other way that will cause damage.

C. Repair items that have become damage or corroded to the satisfaction of the Engineer prior to incorporating them into the work.

1.06 PROJECT/SITE REQUIREMENTS

A. Field measurements shall be taken at the site, prior to fabrication of items, to verify or supplement indicated dimensions and to ensure proper fitting of all items.

PART 2 PRODUCTS

2.01 GENERAL

A. The use of manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.

B. Like items of materials shall be the end products of one manufacturer in order to provide standardization for appearance, maintenance and manufacturer's service.

2.02 MATERIALS

A. Unless otherwise noted, materials for miscellaneous metals shall conform to the following standards:

1. Structural Steel:	Wide flange shapes: ASTM A992.
2. Other shapes; plates; rods and bars:	ASTM A36.
3. Structural Steel Tubing:	ASTM A500, Grade B.
4. Welded and Seamless Steel Pipe:	ASTM A501 or ASTM A53, Type E or S, Grade B Schedule 40. Use standard malleable iron fittings, galvanized for exterior work.
5. Steel Sheets:	ASTM A1008.
6. Stainless Steel Plates, Sheets, and Washers:	
a. Exterior, Submerged or Industrial Use:	ASTM A240, Type 316 (Type 316L for welded components).
b. Interior and Architectural Use:	ASTM A240, Type 304.

7.	Stainless Steel Shapes and Bars:	
	a. Exterior, Submerged or Industrial Use:	ASTM A276, Type 316 (Type 316L for welded components).
	b. Interior and Architectural Use:	ASTM A276, Type 304.
8.	Stainless Steel Bolts	ASTM F593, Type 316.
9.	Stainless Steel Nuts:	ASTM F594, Type 316.
10.	Carbon Steel Bolts and Studs:	ASTM A307, Grade A (hot dip galvanized nuts and washers where noted).
11.	High Strength Steel Bolts, Nuts and washers:	ASTM A325 (mechanically galvanized per ASTM B695, Class 50, where noted)
	a. Elevated Temperature Exposure:	Type I.
	b. General Application:	Type I or Type II.
12.	Galvanizing:	ASTM A123, Zn w/0.05 percent minimum Ni.
13.	Galvanizing, hardware:	ASTM A153, Zn w/0.05 percent minimum Ni.
14.	Galvanizing, anchor bolts:	ASTM F2329, Zn w/0.05 percent minimum Ni.
15.	Welding electrodes, steel:	AWS A5.1 E70xx.

2.03 ANCHORS, BOLTS AND FASTENING DEVICES

A. Unless otherwise noted, anchor bolts shall be ASTM F1554, Grade 36. Provide standard headed bolts with heavy hex nuts and Grade A washers. Where galvanized anchor bolts are shown or specified, provide standard headed bolts with heavy hex nuts and Grade A washers, all galvanized in accordance with ASTM F2329.

B. Unless otherwise noted, bolts for the connection of carbon steel or iron shall be steel machine bolts; bolts for the connection of galvanized steel or iron shall be galvanized steel or stainless steel machine bolts; and bolts for the connection of aluminum or stainless steel shall be stainless steel machine bolts.

C. Unless otherwise noted, expansion anchors shall be zinc plated carbon steel wedge type anchors complete with nuts and washers. Type 316 stainless steel wedge type anchors shall be used where they will be submerged or exposed to the weather or where stainless steel wedge type anchors are shown or specified. When the length or embedment of the bolt is not noted on the Drawings, provide length sufficient to place the wedge and expansion cone portion of the bolt at least 1-in behind the concrete reinforcing steel. Expansion anchors shall be Hilti, Kwik-Bolt TZ; Simpson Strong-Tie Strong-Bolt 2 Wedge Anchor; Powers Power-Stud+ or equal.

D. Adhesive anchor system, for fastening to solid concrete substrate, shall be a system manufactured for the installation of post installed studs including anchoring hardware and chemical dispenser. Injection adhesive shall be a two-component epoxy system including a

hardener and a resin, furnished in pre-measured side-by-side cartridges which keep the two components separate. Side-by-side cartridges shall be designed to accept a static mixing nozzle which thoroughly blends the two components and allows injection directly into the drilled hole. Provide zinc plated carbon steel or Type 316 stainless steel stud assemblies as indicated on the Drawings consisting of an all-thread anchor rod with nut and washer. Adhesive anchor system shall be Hilti RE 200; Simpson Strong Tie SET-XP; ITW Ramset Red Head Epcon G5; or equal. Unless otherwise noted, anchorage designs shown on the Drawings are based on Hilti RE 500 SD.

E. Machine bolts and nuts shall conform to Federal Specification FF-B-575C. Bolts and nuts shall be hexagon type. Bolts, nuts, screws, washers and related appurtenances shall be Type 316 stainless steel.

2.04 MISCELLANEOUS STEEL

A. All miscellaneous metal work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability. Holes shall be drilled or punched. Edges shall be smooth and without burrs. Fabricate supplementary pieces necessary to complete each item though such pieces are not definitely shown or specified.

B. Connections and accessories shall be of sufficient strength to safely withstand the stresses and strains to which they will be subjected. Exposed joints shall be close fitting and jointed where least conspicuous. Threaded connections shall have the threads concealed where practical. Welded connections shall have continuous welds or intermittent welds as specified or shown. The face of welds shall be dressed flush and smooth. Provide holes for temporary field connections and for attachment of the work of other trades.

C. Miscellaneous steel items shall include any miscellaneous steel called for on the Drawings and not otherwise specified.

D. Steel pipe pieces for sleeves, lifting attachments and other functions shall be Schedule 40 pipe unless otherwise shown on the Drawings. Wall and floor sleeves, of steel pipe, shall have welded circumferential steel waterstops at mid-length.

E. Galvanizing, where required, shall be the hot-dip zinc process after fabrication. Coating shall be not less than 2 oz/sq ft of surface.

2.05 MISCELLANEOUS STAINLESS STEEL

A. All miscellaneous metal work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability. Holes shall be drilled or punched. Edges shall be smooth and without burrs. Fabricate supplementary pieces necessary to complete each item though such pieces are not definitely shown or specified.

B. Connections and accessories shall be of sufficient strength to safely withstand the stresses and strains to which they will be subjected. Exposed joints shall be close fitting and jointed where least conspicuous. Threaded connections shall have the threads concealed where practical. Welded connections shall have continuous welds or intermittent welds as specified or shown.

The face of welds shall be dressed flush and smooth. Provide holes for temporary field connections and for attachment of the work of other trades.

C. Miscellaneous stainless steel items shall include any miscellaneous stainless steel called for on the Drawings and not otherwise specified.

PART 3 EXECUTION

3.01 INSTALLATION

A. Zinc coating which has been burned by welding, abraded, or otherwise damaged shall be cleaned and repaired after installation. The damage area shall be thoroughly cleaned by wire brushing and all traces of welding flux and loose or cracked zinc coating removed prior to painting. The cleaned area shall be painted with two coats of zinc oxide-zinc dust paint conforming to the requirements of Military Specifications MIL-P-15145. The paint shall be properly compounded with a suitable vehicle in the ratio of one part zinc oxide to four parts zinc dust by weight.

B. Specialty products shall be installed in accordance with the manufacturer's recommendations.

C. Expansion bolts shall be checked for tightness a minimum of 24 hours after initial installation.

D. Install adhesive anchor system in strict compliance with the manufacturer's recommendations, including drill bit diameter, surface preparation, temperature, moisture conditions, injection and installation of bolts. Use oil free compressed air to blast out loose particles and dust from the drilled holes. Bolts must be clean and free of dirt, oil, grease, ice or other material which would reduce bond.

E. All steel surfaces that come into contact with exposed concrete or masonry shall receive a protective coating of an approved heavy bitumastic troweling mastic applied in accordance with the manufacturer's instructions prior to installation.

F. Where aluminum contacts a dissimilar metal, apply a heavy brush coat of zinc-chromate primer followed by two coats of aluminum metal and masonry paint to the dissimilar metal.

G. Where aluminum contacts masonry or concrete, apply a heavy coat of approved alkali resistant paint to the masonry or concrete.

H. Where aluminum contacts wood, apply two coats of aluminum metal and masonry paint to the wood.

I. Between aluminum gratings, aluminum stair treads, or aluminum handrail brackets and steel supports, insert 1/4-in thick neoprene isolator pads, 85 plus or minus 5 Shore A durometer, sized for full width and length of bracket or support.

END OF SECTION

SECTION 11700
OVERHEAD DUST SUPPRESSION SYSTEM

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This section covers the furnishing and installation of materials, equipment, and appurtenances associated with a high-pressure overhead dust suppression system. Furnish all labor, materials, tools, equipment, service, and incidentals required to design, install, and place a high-pressure overhead dust suppression system as shown on the Drawings and as specified herein.

B. The system shall meet the design conditions and features and as indicated on the drawings. All required piping, valves and appurtenances may not be indicated on the drawings but shall be provided for a complete system compliant with the requirements indicated herein.

1.02 RELATED WORK

A. General requirements are in Division 1.

B. Miscellaneous metals are included in Division 5.

C. General mechanical work not described in this Section is included in the respective Sections of Division 15.

D. Electrical work not described in this Section is included in Division 16 or shown on the Drawings.

1.03 SUBMITTALS

A. Submit, in accordance with Section 01300, the following:

B. Drawings and data: Complete design assembly, and installation drawings; together with complete engineering data covering the materials used and the parts, devices, and accessories forming a part of the equipment and appurtenances furnished, shall be submitted.

C. The data and specifications submitted shall include, but not be limited to, the following:

1. Design Documents.
   a. Complete working plans, hydraulic calculations, and water supply data.

2. Equipment, Piping, and Appurtenances
   a. Name of manufacturer
   b. Type and model
   c. Construction materials, thickness, and finishes
   d. Capacities
   e. Pressure and temperature ratings
   f. Overall dimensions
   g. Piping connection type, size, and location
   h. Wiring diagrams

i. Pressure loss data
j. Net weight

3. Assembly Drawings: Isometric assembly drawings of each individual piping system shall be submitted. The assembly drawings shall indicate center-to-center dimensions of piping connections and runs, and shall tie in the location of piping runs to column rows, floor elevations, and other reference points. The assembly drawings shall also list the piping size, schedule, and material in each piping system.

4. Operation and Maintenance Manuals: Adequate operation and maintenance information shall be supplied as required in the Submittals section. Operation and maintenance manuals shall be submitted in accordance with Section 01730.

5. The system manufacturer shall submit design calculations prepared, sealed, and signed by a Professional Civil or Mechanical Engineer. The calculation shall include pump selection, headlosses through hose piping under varying operations scenarios, and pipe sizing: submit pipe/hose support designs as well.

1.04 REFERENCE STANDARDS

A. American Society of Testing and Materials (ASTM) International

1. ASTM A53-Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc-Coated, Welded and Seamless

B. Occupational Safety and Health Administration (OSHA)

C. Underwriters Laboratory (UL)

D. Where reference is made to one of the above or other referenced standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. All of the equipment specified herein shall be furnished by a single supplier who shall be responsible for the satisfactory performance of the equipment.

B. All materials and equipment which will become a part of the installed work shall be new and unused.

C. The system shall be installed by a firm having previously installed a minimum of five systems similar in size and scope to this project. Acceptable suppliers include NCM Odor and Dust Control or approved equal.

D. Provides services of the supplier's engineer or technician who is specifically trained on the type of equipment to be furnished under this Section. Submit qualifications of the engineer or technician(s) for approval. Supplier shall be responsible for assisting the Contractor in locating anchor bolts, setting, leveling, aligning, etc, for installation, in coordinating piping and hose, electrical and miscellaneous utility connections, and in supervising the installation. Provide written certification that the installation is complete and operable in all respects, and that no

conditions exist which may affect the warranty. Provide a written report summarizing test procedures and tested and measured variables.

1.06 PERFORMANCE AND DESIGN REQUIREMENTS

A. All piping, equipment and appurtenances shall be designed to meet the performance and design conditions specified herein. The system shall be designed on the principal of wetting airborne dust with atomized water. The system is designed to control dust generated during normal operation over the residential haul unloading area. The system base and control panel allow for total control of the system. The pump and motor will be controlled using a VFD to allow the pump to speed up or down to eliminate pump damage from back pressure. Air blow down connections are included in the base setup using the Owner's air compressor to rid the lines of water during freezing temperatures.

B. Documentation of the test results confirming the performance standards shall be submitted in accordance with the submittal paragraph.

C. An air connection shall be included at the base setup, which shall consist of necessary valves required to isolate the system when not in use.

D. The supplier shall be responsible for verifying the quality of the water supplied, and providing a heavy duty water filter, two stage filtration system and any additional water treatment to prevent nozzle malfunctions due to water quality issues.

E. Moving parts of all equipment shall be readily accessible for inspection, lubrication, and repair and where necessary, shall be protected from vehicular equipment. Moving parts of equipment shall also be guarded as required to protect personnel during operation.

F. All connection material required attaching the equipment provided under this Section to structures or components shall be provided unless otherwise specified.

G. The system and associated components shall be of a standard and proven design, unless specified herein. The system shall be fitted with components suited for the environment in which they are located.

H. The flow rates for the application points in the system shall be the system Supplier's standard unless otherwise noted. In additional to the application points to be considered in sizing the pumping equipment, a contingency factor equal to 15 percent of the total of the above listed spray requirements shall be included in the equipment sizing of each system.

I. Pipe sizing: The system shall be hydraulically calculated, and shall include a safety factor of 10% of the design flow.

J. The Contractor shall provide a minimum ¾-inch full flow ball valve with female threads of a minimal flow of 4 gpm to be within 5-feet of the system base unit. The Contractor shall use wash hose station (WHS-5) for supply of water to the system base unit.

1.07 DELIVERY, STORAGE AND HANDLING

A. Delivery, storage, and handling shall be in accordance with manufacturer's recommendations.

1.08 MAINTENANCE

A. The supplier shall provide spare parts for all working components of the system base that deem the system operational. This shall include but not be limited to: spare motor, pump, pressure unloader, low pressure cut off solenoid, full set of nozzles. A supply of 2 spare water filters shall be provided. A supply of 2 spare remote controls shall be provided.

B. Extra materials shall be packaged with labels indicating the contents of each package. Each label shall include the manufacturer's name, equipment identification, part nomenclature, part number, address of nearest distributor, and current list price. Extra materials shall be delivered to Owner as directed.

C. Provide the services of a factory-trained service engineer, specifically trained on the type of equipment specified and who has complete knowledge of proper operation and maintenance. The service engineer shall provide field and classroom instruction on operation and maintenance of the equipment, including startup, shut-down, operation, troubleshooting, lubrication, maintenance and safety. Additional operation and maintenance requirements are included in Section 01730.

1.09 WARRANTY

A. The equipment specified herein shall have a 1 year system warranty that includes parts, materials and labor.

PART 2 PRODUCTS

2.01 GENERAL

A. Piping, equipment, and appurtenances furnished and installed under this section shall be designed, fabricated, assembled, erected, and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions, and recommendations furnished by the manufacturer unless exceptions are noted by the Engineer.

B. Contractor shall verify that each component of the system is compatible with all other parts of the system; that all piping, equipment, and appurtenances are appropriate for the intended function; and that all devices necessary for a properly functioning system have been provided.

C. Equipment and appurtenances furnished under this section shall be the standard product of the manufacturer. Where two more units of the same class of equipment are required, they shall be the products of a single manufacturer; however, all the component parts of the system need not be the products of one manufacturer.

D. Contractor shall coordinate with the electrical contractor to make certain that the field wiring associated with this section is complete in accordance with the requirements of the equipment specified herein. Contractor shall coordinate the wiring of control devices to the equipment furnished and installed.

E. Contractor shall become familiar with details of the work, shall verify dimension in the field, and notify Engineer of any discrepancy before performing the work.

2.02 MATERIALS

A. All components of the system shall be designed to meet the specified conditions.

B. All piping systems and related components shall be rated for the working pressure as determined in the calculations.

C. All anchor bolts, expansion anchors, nuts and washers shall be 316 stainless steel. Power-driven anchor assemblies shall not be used.

D. All piping, pipe supports, valves, hoses, and fittings integral to the system, and as required to complete the piping system, shall be furnished with the complete system. All rigid piping and fittings shall be stainless steel. Valves to be furnished shall include all specialty valves, but not limited to pressure control valves, solenoid valves, and shutoff valves.

E. Rigid piping on the supply side of the backflow prevention device shall be as specified in other sections for potable water use. Rigid piping on the dust suppression side of the backflow prevention device shall be 316 stainless steel.

F. High pressure hose shall be R17 hydraulic hose rated for 3,300 pounds per square inch of pressure. Hose shall be ultra-violent resistant.

G. Pipe and hose shall be furnished complete with all fittings, jointing materials, supports and anchors, and other accessories required for a complete system.

H. Service valves shall be UL-listed at the minimum working pressure rating.

I. Pipe and hose supports shall be suitable for the application, construction and type and size of pipe used.

2.03 EQUIPMENT

A. Each automatic system shall be complete with isolation valves, check valves, system pump, nozzle assemblies, water discharge and bypass assembly, and other required components to pump water and to provide the required quantity of spray water to all application points at the required pressures. Each pumping system shall be provided as an assembled unit mounted on a skid.

B. The filter system shall include a high density water filter and two stage filtration system. Filter system to be integral to pump unit, or skid mounted adjacent to pump unit, readily accessible.

C. The spray flow controllers shall be complete with solenoid valves, line strainers with blow down valves, a manual shutoff valve, drain valves, and other required components to filter and control the flow of spray water to the spray headers at all application points. Inlet water pressure gauge and inlet water pressure regulator shall also be provided.

D. The spray nozzles shall be mounted in an acceptable manner to protect the nozzle against material impact and other possible sources of damage.

E. Equipment shall be rated for an outdoor environment and provided with necessary containment and protection.

2.04 EQUIPMENT BASE

A. The equipment base which includes pump, motors, starters and main control panel shall be located on an existing concrete curb as shown on the drawings.

B. Equipment shall be housed in a stainless steel cabinet with locking control compartment, with removable sides and top. Enclosure shall be constructed using UL listed components rated for outdoor use. The equipment base enclosure shall be of suitable size to permit routine maintenance of system components.

C. Vibration isolators shall be provided for cabinet base plate and motor.

2.05 ELECTRICAL

A. The Contractor shall provide electrical power to a 208 volt, 3 phase, 30 amp breaker in an OSHA approved disconnect, to be within 5-feet of the location of the system base as shown on the Drawings.

2.06 CONTROLS

A. A control panel shall be furnished at the system base. The panel shall contain all logic devices required for the system, including local control and indicating lights as well as motor starters and variable frequency drives. The controls shall include system on/off switch, run time meter and green system on indicator light.

B. The system shall be capable of being manually started from the local control panel at the equipment base or from a remote controller located in the tipping floor front end loader operator. The remote controller shall be battery powered. The remote controller shall communicate through a wireless connection with the control panel located at the equipment base. The remote controller shall have the following controls:

1. Misting on/off

C. All panels shall have suitable enclosures rated for outdoor use and UL listed. Panels shall be NEMA 4x and constructed of stainless steel.

D. Control panel interface (on/off switch, run time meter and indicator lights) shall be mounted no higher than 4-ft above finished floor

PART 3 EXECUTION

3.01 INSTALLATION

A. Piping, equipment and appurtenances furnished under this Section shall be installed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by the Engineer.

B. The system flow controller assembly drains shall be routed to the nearest floor drain as indicated on the Drawings.

C. Pressure gauges shall be installed at the inlet to the system enclosure and pump system discharge. Pressure gauges shall be provided with connections not less than ¼ inch with soft metal seated globe valve arranged for draining pipe between gage and valve. Gauges shall be installed to permit removal.

3.02 FIELD TESTING

A. Immediately prior to the final inspection, equipment, piping and appurtenances shall be thoroughly cleaned. Dirt and debris shall be cleaned from spray nozzles. Spray nozzles having paint other than factory finish shall be replaced with new spray nozzles.

B. A decision shall be reached during the inspection concerning the resolution of any discrepancies. All work determined to be the responsibility of the Contractor, and included within the scope of the specifications, shall be promptly complete at no expense to the Owner.

C. The final acceptance of the system shall be made after the completion of the corrective work resulting from the final testing and inspection.

END OF SECTION

This Page Intentionally Left Blank

SECTION 15100
VALVES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install complete and ready for operation and test all valves as shown on the Drawings and as specified herein.

B. The equipment shall include, but not be limited to, the following;

1. Solenoid Valves.

1.02 SUBMITTALS

A. Submit to Engineer, in accordance with Section 01300, materials required to establish compliance with this Section. Equipment Submittals shall include at least the following:

1. Valve tag number.

2. Manufacturer and supplier.

3. Address at which equipment will be fabricated or assembled.

4. Drawings showing assembly details, materials of construction and dimensions.

5. Descriptive literature, bulletins and/or catalogs of the equipment.

6. Total weight of each item.

7. A complete bill of materials.

8. Additional submittal data, where noted with individual pieces of equipment.

9. Individual electrical control schematics and wiring diagrams for each valve operator with external interfaces, identified exactly as detailed on Electrical and Instrumentation Drawings. Standard catalogue cut sheets that show typical wiring diagrams only are not acceptable. Valve actuators shall be coordinated with electrical requirements shown on Drawings and valves as specified herein.

B. Manufacturer's Installation and Application Data.

C. Operating and Maintenance Data.

1. Operating and maintenance instructions shall be furnished to Engineer as provided in Section 01730. Instructions shall be prepared specifically for this installation and shall include required cuts, drawings, equipment lists, descriptions and other information required to instruct operating and maintenance personnel unfamiliar with such equipment.

1.03 REFERENCE STANDARDS

A. American National Standards Institute (ANSI):

B. National Electrical Manufacturers Association (NEMA).

C. Underwriters Laboratories (UL).

D. Factory Mutual (FM).

E. Fluid Controls Institute (FCI).

F. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Valves and appurtenances shall be products of well established firms who are fully experienced, minimum ten years, reputable and qualified in manufacture of particular equipment to be furnished.

2. Equipment shall be designed, constructed and installed in accordance with best practices and methods and shall comply with this Section as applicable.

3. Units of the same type shall be the product of one manufacturer.

B. Inspection of units may also be made by Engineer or other representative of Owner after delivery. Equipment shall be subject to rejection at any time due to failure to meet any of specified requirements, even though submittal data may have been accepted previously. Equipment rejected after delivery shall be marked for identification and shall be removed from job site at once.

1.05 SYSTEM DESCRIPTION

A. Equipment and materials specified herein are intended to be standard for use in controlling flow of water as noted on Drawings.

B. Valves, appurtenances and miscellaneous items shall be installed as shown on Drawings and as specified, so as to form complete workable systems.

1.06 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping:

1. Care shall be taken in loading, transporting and unloading to prevent injury to the valves, appurtenances, or coatings. Equipment shall not be dropped. Valves and appurtenances shall be examined before installation and no piece shall be installed which is found to be defective. Damage to the coatings shall be repaired as acceptable to Engineer.

2. Prior to shipping, ends of valves shall be acceptably covered to prevent entry of foreign material. Covers shall remain in place until after installation and connecting piping is completed.
   a. Valves smaller than 3-in shall be shipped and stored as above except that heavy cardboard covers may be used on the openings.
   b. Corrosion in evidence at the time of acceptance by the Owner shall be removed, or the valve shall be removed and replaced.

B. Storage and Protection:

1. Special care shall be taken to prevent plastic and similar brittle items from being directly exposed to the sun, or exposed to extremes in temperature, to prevent deformation. See the individual piping sections and manufacturer's information for further requirements.

1.07 MAINTENANCE

A. Special tools and the manufacturer's standard spare parts, if required for normal operation and maintenance, shall be supplied with the equipment in accordance with Section 01730 and where noted, as specified herein. Tools shall be packaged in a steel case, clearly and indelibly marked on the exterior to indicate equipment for which tools are intended.

B. Provide one operations and maintenance manual for each type of valve and operator supplied under this specification in accordance with Section 01730.

C. Included within operations and maintenance manuals, provide a list of all spare and replacement parts with individual prices and location where they are available.

1.08 VALVE DESIGNATIONS AND SCHEDULE

A. Valves shall be identified by a unique valve tag as identified on the Drawings. Specific type of valve to be used will be identified by symbol and/or call out on Drawings. Contractor shall identify each valve by its assigned tag number on shop drawings and equipment submittals.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT - GENERAL

A. Use of a manufacturer's name and/or model or catalog number is for purpose of establishing standard of quality and general configuration desired.

B. Valves and appurtenances shall be of size shown on the Drawings or as noted and as far as possible equipment of same type shall be identical and from one manufacturer.

C. Valves and appurtenances shall have name of maker, nominal size, flow directional arrows, working pressure for which they are designed and standard referenced, cast in raised letters or via riveted stainless steel nameplate upon some appropriate part of the body.

D. Unless otherwise noted, items shall have a minimum working pressure of 150 psi or be of same working pressure as pipe they connect to, whichever is higher and suitable for pressures noted where they are installed.

2.02 SOLENOID VALVES:

A. Solenoid valves shall be Series 8210 2-way valves by ASCO Valve; Red Hat by Automatic Switch Co., or equal. Valve size shall be of size as noted on the Drawings.

B. Valves shall be energized to be normally open "fail open" or normally closed "fail close" as noted on the Drawings.

C. Solenoid enclosure shall be RedHat II - Watertight, Type 4 or equal.

D. Valves shall have NPT end connections unless otherwise specified on the Drawings.

E. Valve materials shall be as follows:

1. Body – brass

2. Disc Holder– PA

3. Seals –NBR

4. Core Tube – 305 Stainless Steel

5. Core and Plugnut – 430F Stainless Steel

6. Springs – 302 Stainless Steel

7. Shading Coil – Copper

F. The minimum operating pressure differential for solenoid valves shall be 0 psi. The maximum operating differential pressure shall be no less than 120 psi.

G. Unless otherwise specified on the Drawings, solenoid valves shall be 24 volt DC, 60 Hz, continuous duty Class F coils.

2.03 CONTROLS

A. Solenoid Valve Wireless Controller/Transmitter shall be Model 91100 – 2 Function with Standard Transmitter – Narrow Band by Lodar® Wireless Solutions or approved equal. Unit shall be installed as shown on the Drawings. Contractor shall provide all necessary accessories for a complete functioning unit as described herein and on the Drawings.

1. The wireless controller/transmitter will be used to control the operation of solenoid valve, SV-4 which controls the flow of water to the hopper dust suppression system. The hopper dust suppression system will be operated by the front-end loader operator located on the tipping floor. SV-4 will be normally closed with no flow of water to the hopper dust suppression system nozzles. Prior to loading waste into the hopper, the front-end loader operator will activate the dust suppression system by opening SV-4 via the wireless controller. After loading of waste into the hopper is complete, the front-end loader operator will turn off the dust suppression system by closing SV-4 via the wireless controller.

2. The unit shall be provided with 9881 IL programming for push/push latching capability, to provide the front-end loader operator one touch capability without needing to continuously hold down a button for operation of the dust suppression system.

3. Unit shall be provided with two spare transmitters.

2.04 FACTORY INSPECTION AND TESTING

A. Factory inspection, testing and correction of deficiencies shall be done in accordance with the referenced standards and as noted herein.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Valves and appurtenances shall be installed per manufacturer's instructions in locations shown, true to alignment and rigidly supported. Damage to above items shall be repaired to satisfaction of Engineer before they are installed.

B. Install brackets and appurtenances as shown on Drawings, or otherwise required. Before setting these items, check Drawings and figures which have a direct bearing on their location. Contractor shall be responsible for proper location of valves and appurtenances during construction of the work.

C. Materials shall be carefully inspected for defects in construction and materials. Debris and foreign material shall be cleaned out of openings, etc. Valves and other equipment which do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to Owner.

D. Where installation is covered by a referenced standard, installation shall be in accordance with that standard, except as herein modified, and Contractor shall certify such. Also note additional requirements in other parts of this Section.

E. Unless otherwise noted, joints for valves and appurtenances shall be made up utilizing same procedures as specified under applicable type connecting pipe joint and valves and other items shall be installed in proper position as recommended by manufacturer. Contractor shall be responsible for verifying manufacturers' torqueing requirements for all valves.

3.02 INSPECTION, TESTING AND CORRECTION OF DEFICIENCIES

A. See also Division 15. Take care not to over pressure valves or appurtenances during pipe testing. If unit proves to be defective, it shall be replaced or repaired to satisfaction of Engineer.

B. Functional Test: Prior to startup, items shall be inspected for proper alignment, quiet operation, proper connection and satisfactory performance. After installation valves shall be cycled five times from full open to full closed in presence of Engineer or Owner without vibration, jamming, leakage, or overheating.

3.03 CLEANING

A. Items including valve interiors shall be inspected before line closure, for presence of debris. At option of Engineer, internal inspection of valve and appurtenances may be required any time that likelihood of debris is a possibility. Pipes and valves shall be cleaned prior to installation, testing disinfection and final acceptance.

END OF SECTION

SECTION 15400
PLUMBING - GENERAL PROVISIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment, services, and incidentals required; and install and test a complete plumbing system as specified and shown on the Drawings.

B. The Contractor shall be fully responsible for the proper execution and performance of the work described herein. It shall be their responsibility to inspect all installation conditions and bring to the attention of the Engineer any conditions which may affect their work adversely. They shall report to the Engineer, prior to commencing any portion of this work, any conditions unsuitable for the installation of their portion of the work.

C. Mention herein or indication on the Drawings of equipment, materials, operation, or methods shall require that each item mentioned or indicated be provided to make a complete system of plumbing ready for continuous operation.

D. The location of all equipment, fixtures, and piping shall be considered as approximate only and the right is reserved by the Engineer to change at any time, before the work is installed, the position of such equipment and piping to meet structural conditions and to provide proper headroom clearance or for other sufficient causes and such changes shall be made without additional expense to the Owner.

E. Comply with all the laws, ordinances, codes, rules, and regulations of the State, local, or other authorities having jurisdiction over any of the work specified herein.

F. Obtain all required permits and pay all legal fees for the same and in general take complete charge and responsibility for all legal requirements pertaining to this Section of the work.

G. Requirements set forth in this Section and indicated on the Drawings shall be followed when in excess of the required or minimum regulations.

H. If any work is performed and subsequent changes are necessary to conform to the regulations, such change shall be made as part of this work at no additional cost to the Owner.

I. All work shown on the Drawings is intended to be approximately correct to scale, but figured dimensions and detailed drawings shall be followed in every case. The Drawings shall be taken in a sense as diagrammatic. Size of pipes and general method of running them are shown, but it is not intended to show every offset and fitting nor every structural difficulty that may be encountered. To carry out the true intent and purpose of the Drawings, all necessary parts to make complete working systems ready for use shall be furnished without extra charge.

1.02 SUBMITTALS

A. Operation and Maintenance Data

1. Operating and maintenance manuals shall be furnished to the Engineer as provided in Section 01730. The manuals shall be prepared specifically for this installation and shall

include all required cuts, drawings, equipment lists, descriptions, etc., that are required to assist operation and maintenance personnel unfamiliar with such equipment. The following information shall be considered a minimum. Where applicable, provide information required for specific pieces of equipment.

a. Personnel familiar with the operation and maintenance of the specific information shall prepare manuals.
b. Equipment shall be identified with the Engineer's Equipment Numbers and Identification as shown in the Schedules and on the Drawings.
c. Provide information in three-ring binders. All sheets shall have reinforced punches. Tabbed dividers shall separate all sections. Drawings shall be bound in the manual, or contained in envelopes bound into the manual.

2. Contents - Each volume shall contain the following minimum contents:
   a. Installation including instructions for unpacking, installing, aligning, checking, and testing. Foundation data, allowable piping loads, and electrical design shall be included.
   b. Operating Instructions to provide pre-operational checks, startup and shutdown, and description of all control modes. Include emergency procedures for all fault conditions and actions to be taken for all alarms. Procedures for long-term storage shall be included.
   c. Maintenance shall include preventive and corrective. Schedules for test of other functions are to be included. Provide a list of tools required to service the equipment. Troubleshooting instructions, to include a troubleshooting guide, shall be included.

B. In general, corrections or comments or lack thereof made relative to submittals during review shall not relieve the Contractor from compliance with the requirements of the drawings and specifications. Submittals are for review of general conformance with the design concepts of the project and general compliance with the Contract Documents. The Contractor is responsible for the final design conforming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating the work of all trades, and performing the work in a safe and satisfactory manner.

1.03 MANUFACTURER'S SERVICES

A. A representative of the manufacturer who has complete knowledge of proper operation and maintenance shall be provided for the number of eight-hour days as listed below to instruct representatives of the Owner on proper operation and maintenance. With the Owner's permission, this work may be conducted in conjunction with the inspection and the installation and test run as provided under PART 3. If there are difficulties in operation of the equipment due to the manufacturer's design or fabrication, additional service shall be provided at no additional cost to the Owner.

B. Provide manufacturer's services for testing and startup of the following equipment:

1. Reduced Pressure Backflow Preventers (one day).

2. Emergency Showers (one day).

1.04 REFERENCE STANDARDS

A. ASTM International (ASTM)

B. American National Standards Institute (ANSI)

C. American Water Works Association (AWWA)

D. National Fire Protection Association (NFPA)

E. National Electrical Manufacturers Association (NEMA)

F. National Sanitation Foundation (NSF)

G. Plumbing and Drainage Institute (PDI)

H. Cast Iron Soil Pipe Institute (CISP)

I. Underwriters Laboratories (UL)

J. Factory Mutual (FM)

K. American Society of Plumbing Engineers Data Book (May be used as a design guide.)

L. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. All products and materials provided for potable water service application under the plumbing sections shall be certified "lead-free" by an ANSI-certified, third-party independent organization. The term "lead-free" shall refer to the wetted surface of pipe, fittings, and fixtures in potable water systems that have a weighted average lead content less than or equal to 0.25 percent per the Safe Drinking Water Act (Sec. 1417) amended 1-4-2011 and other equivalent state regulations. Non lead-free materials can be purchased and installed in non-potable water systems.

B. All equipment of a given type included in this Section shall be furnished by or through a single manufacturer or as specified on the schedules.

C. Inspection by the Engineer's representative, or failure to inspect, shall not relieve the Contractor of responsibility to provide materials and perform the work in accordance with the documents.

D. The Owner and Engineer reserve the right to sample and test any materials after delivery, and to reject all components represented by a sample that fails to comply with the specified requirements.

E. An authorized representative of the manufacturer shall perform the initial startup of the equipment. The use of local sales representatives to perform this work is not acceptable unless the manufacturer provides documented evidence that the sales representative has been specifically trained for this work.

F. All rotating parts of equipment shall be statically and dynamically balanced at the factory.

1.06 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be inspected for size, quality, and quantity against approved shop drawings upon delivery.

B. Delivery schedule of all equipment shall be coordinated with the Contractor. Equipment ready for shipment prior to the agreed-on shipping date shall be stored without cost to the Owner by the manufacturer.

C. All materials shall be suitably packed for shipment and long-term storage. Each package shall be labeled to indicate the project and the contents of each package. Where applicable, equipment numbers shall be marked on the container.

D. All equipment shipped that is exposed, such as on a flatbed truck, shall be protected during transit. The equipment shall be protected from moisture, road salt, dirt, stones, or other materials thrown up from other vehicles. Electrical components shall be protected as above, but with special attention to moisture. The method of shipment protection shall be defined in the submittals.

E. Instructions for the servicing and startup of equipment in long-term or prolonged storage shall accompany each item.

F. All materials shall be stored in a covered dry location off of the ground. When required to protect the materials, they shall be stored in a temperature-controlled location.

1.07 COORDINATION

A. The Drawings indicate the extent and general arrangement of the systems. If any departures from the Drawings or Specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted as soon as practical for review. No such departures shall be made without the prior written concurrence of the Engineer.

B. Coordinate the location and placement of all concrete inserts and welding attachments with the structural engineer.

C. Assume full responsibility for coordination of the Plumbing systems, including scheduling and verification that all structures, piping, and the mounting of equipment are compatible.

1.08 SUPPORTS

A. All components shall be provided with lugs, brackets, or field-supplied devices to allow the components to be firmly attached to the structure.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 INSTALLATION

A. All items shall be installed according to the applicable manufacturer's recommendations, the details shown on the Drawings, and as specified herein and in other related Sections.

B. Start up each piece of equipment and system, and make all adjustments so that the system is placed in proper operating condition.

C. Do not install any equipment or materials until the Owner and Engineer have approved all submittals. If any equipment or materials are installed prior to approval of the submittals, it shall be at the Contractor's risk.

D. All work shall be installed in accordance with the manufacturer's printed instructions and shall be rigid, plumb and true to line, with all parts in perfect working order. Maintain protective covers on all units until final cleanup time and, at that time, remove covers and clean and polish all surfaces.

E. Attention is called to the necessity for elimination of transmission of vibration from mechanical equipment to building structures. All equipment, therefore, shall be carefully selected and installed to meet this condition and isolators and water hammer arrestors shall be provided where required.

3.02 PROTECTION

A. Materials, fixtures, and equipment shall be properly protected at all times; and all pipe openings shall be temporarily closed so as to prevent obstruction and damage.

3.03 COORDINATION SKETCHES

A. It shall be the responsibility of the subcontractor to have employed a competent coordinator of mechanical systems and, as such, to provide all coordination of drawings or sketches as may be required or deemed necessary by the Engineer to obtain the required ceiling heights and eliminate conflicts with all piping, ducts, and electrical installation.

3.04 INSTRUCTION

A. Instruct such persons as designated by the Owner in the care and use of all plumbing equipment and piping systems installed.

END OF SECTION

This Page Intentionally Left Blank

SECTION 15410
PLUMBING - PIPING SYSTEMS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the basic Plumbing Systems of Piping and the materials of each system, including valves and associated appurtenances.

B. Furnish all labor, materials, equipment, services, and incidentals required; and install complete interior Plumbing Piping Systems as shown on the Drawings and as specified herein.

C. All piping and equipment shown on the Drawings is intended to be approximately correct to scale, but figured dimensions and detailed drawings of the actual equipment furnished shall be followed in every case. The Drawings shall be taken in a sense as diagrammatic. Size of piping is shown, but it is not the intent to show every offset or fitting, nor every hanger or support, or structural difficulty that may be encountered. To carry out the intent and purpose of the Drawings, all necessary parts to make a complete working system ready for use shall be furnished without extra charge. The Contractor shall be responsible to coordinate the system installation and routing with the work of all trades.

1.02 RELATED WORK

A. Refer to Section 15400.

B. Solenoid valves are included in Section 15100.

1.03 SUBMITTALS

A. Submit, in accordance with Sections 15400 and 01300, shop drawings and technical literature covering details of all plumbing piping systems being furnished under this Section prior to fabrication, assembly, or shipment.

B. For units that will be shipped exposed, provide a description of the protective packaging that will be used during transit.

C. All submittals shall contain a statement that Sections 15400, 15410, and all other referenced Sections have been read and complied with. The certification statement shall be made by all of the following that are applicable: the Contractor, sub-contractor, and the vendor. The statement shall be an individual statement for each party involved, and shall be included with every submittal and resubmittal.

D. Detailed layout drawings of piping in mechanical rooms and other congested areas shall be provided. Drawings shall show the locations of piping appurtenances, specialties, and all valve banks. Drawings shall be at a minimum scale of 1/4" = 1'0".

E. Provide manufacturer's catalogs, literature, and engineering data on all hangers and supports. Load ratings, materials, and installation shall be in accordance with the recommendations of MSS SP-58 and MSS SP-69.

F. In general, corrections or comments or lack thereof made relative to submittals during review shall not relieve the Contractor from compliance with the requirements of the drawings and specifications. Submittals are for review of general conformance with the design concepts of the project and general compliance with the Contract Documents. The Contractor is responsible for the final design conforming and correlating all quantities and dimensions, selecting fabrication process and techniques of construction, coordinating the work of all trades, and performing the work in a safe and satisfactory manner.

G. Include in the submittal a list of any exceptions to the specifications that are taken, and include any supporting documentation to justify the exception.

1.04 REFERENCE STANDARDS

A. Refer to Section 15400.

1.05 QUALITY ASSURANCE

A. Refer to Section 15400.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 15400.

1.07 COORDINATION

A. Refer to Section 15400.

PART 2 PRODUCTS

2.01 PIPING SYSTEM MATERIALS

A. Metal Equipment Drain Systems

1. Piping shall be Type "DWV" copper with either cast or wrought DWV fittings. Solder shall be Alloy 95TA (95 percent Tin, 5 percent Antimony), ASTM B32. No solder containing lead shall be utilized on the project. Flux shall comply with ASTM B813 and NSF 61.

B. Metal Water Systems

1. All products and materials provided for potable water service shall be certified “lead-free” by an ANSI-certified, third-party independent organization. The term “lead-free” shall refer to the wetted surface of pipes, fittings, and fixtures in potable water systems that have a weighted average lead content less than or equal to 0.25 percent per the Safe Drinking Water Act (Section 1417) amended 1-4-2011 and other equivalent state regulations.

2. Piping shall be Type "L" copper with cast bronze or wrought copper, solder type fittings for above grade. Solder shall be Alloy 95TA (95 percent Tin, 5 percent Antimony), ASTM B32. No solder containing lead shall be utilized on the project. Flux shall comply with ASTM B813 and NSF 61.

C. Dielectric Fittings

1. Provide dielectric fittings between piping and components of dissimilar metals.

2. Dielectric unions shall provide a female iron pipe thread to copper solder connection. The union shall include a Buna gasket and be rated for 180 degrees F at 250 psig or an EPDM gasket and be rated for 300 degrees F at 50 psig. The basis of design is Watts Series 3001A.

2.02 VALVES

A. General

1. Valves shall be of the same manufacturer throughout unless noted otherwise. Metal valves, except as noted otherwise, shall be rated for 125 lb. steam working pressure and shall have round iron wheel handles.

2. All products and materials provided for potable water service shall be certified "lead-free" by an ANSI-certified, third-party independent organization. The term "lead-free" shall refer to the wetted surface of pipes, fittings, and fixtures in potable water systems that have a weighted average lead content less than or equal to 0.25 percent per the Safe Drinking Water Act (Section 1417) amended 1-4-2011 and other equivalent state regulations.

B. Metal Water Valves

1. Lead-free water valves 2-inch and smaller shall be full port ball type equal to Watts LFFBV/LFBVS; Apollo 77FLF-200; Nibco Inc. T/S 585-80-LF; or Hammond UP8301A/UP8311A.

2. Lead-free check valves 3-inch and smaller shall be equal to Stockham LFB-309Y or Nibco Inc. S-413-Y-LF.

3. Lead-free balancing valves 2-inch and smaller shall be Bell and Gossett CB, Nibco S-1810-LF, Watts LFCSM-61-S or equal.

C. Pressure Reducing Valves (PRV)

1. Pressure reducing valves shall be Watts Series LF223 or equal, high capacity water pressure reducing.

2.03 HANGERS, SUPPORTS, AND ANCHORS

A. The absence of pipe supports and details on the drawings shall not relieve the contractor of the responsibility for providing them.

B. Hangers supporting vertical pipes shall be riser pipe clamps similar to Anvil Figure 40 or 261.

C. Hangers supporting horizontal piping shall be clevis hangers similar to Anvil Figure 260.

D. All hangers shall be of a type to permit vertical adjustment after installation.

E. All rods, clamps, hangers, concrete inserts, anchor bolts, brackets, metal insulation shields, channel supports, pipe anchors, and components for pipe supports shall be furnished with a hot-dipped or electro-galvanized finish. All hangers and supports for copper piping shall be plastic coated where in contact with copper.

F. Metal insulation shields shall be provided to prevent insulation damage at hangers and shall be similar to Anvil Figure 167.

G. Manufacturer shall be Anvil, Carpenter & Paterson, Eaton Cooper Industries, Elcen Metal Products, FM Stainless Fasteners, Hilti, Miro Industries, PHP, Unistrut, or equal.

2.04 INSULATION

A. All fittings, flanges, and valves shall be covered with permanently non-combustible, one-piece, factory pre-molded, insulated fitting covers.

B. Insulation material shall be of molded rigid fiberglass sectional pipe insulation rated to 500 degrees F. The insulation shall have a maximum "K" factor of 0.24 at 75 degrees F mean temperature. Jacket shall be kraft paper bonded to aluminum foil reinforced with fiberglass yarn and self-sealing lap with maximum permeability of 0.02 perms. The insulation shall comply with ASTM C547, Type I to 850 degrees F.

C. The insulation jacket shall be a factory or field applied 0.016-inch-thick metal. The jacket shall include a 0.003-inch polyethylene sheet that is laminated to the metal to create a moisture barrier.

D. Insulation manufacturer shall be Certain-Teed, Johns Manville, Knauf, Manson, or equal.

2.05 LABELS

A. The name of the fluid in each pipeline shall be indicated on each pipe system. Pipe label abbreviations shall match the legend in the Drawings.

B. Numbers and letters shall be die-cut from 3.5 mil vinyl film and pre-spaced on carrier tape. Adhesive and finish surface shall be protected with one-piece removable liners. Color shall be white or black as approved depending on substrate color. Label construction shall be suitable for the environment in which they are installed (wet, corrosive, outdoors, etc.).

C. Letter size shall be as indicated in the following table:

Outside Diameter of Pipe or Covering	Size of Legend Letters
3/4- to 1-1/4-inch	1/2-inch
1-1/2- to 2-inch	3/4-inch
2-1/2- to 6-inch	1-1/2-inch

D. The system for preparation and application of letters shall be Type B a.s.i./2 by ASI Sign Systems; Architectural Graphics Inc.; Seton; Brady; Pipe Marker; or equal. Letter type shall be Optima Bold, upper case. Grid 2 spacing shall be employed. The instructions of the manufacturer shall be followed in respect to storage, surface preparation, and applications of letters.

E. Labels shall be provided for each piece of equipment. Unit numbers indicated in equipment schedules shall be provided in vinyl film as specified above on all equipment using 1-inch-high Optima Bold, upper case, Grid 2 spacing, white or black in color as approved depending on substrate.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install all piping, valves, hangers, and appurtenances as specified herein and in the referenced Sections above.

B. Do not install any equipment or materials until the Owner and Engineer have approved all submittals. If any equipment or materials are installed prior to approval of the submittals, it shall be at the Contractor's risk.

C. Reductions in size shall be made using reducing fittings.

D. Valves

1. Install valves in locations grouped and located to be easily operated through access panels, doors, or adjacent to equipment.

2. Install valves in a horizontal to upright position. Valves shall not be installed in down position from the horizontal.

3. Install hose end valves on the house side of main control valves, at the bottom of risers, at low points, and where shown on the Drawings.

4. In making solvent cement connections, the solvent cement or primer shall not be spilled on valves. Any cement allowed to run from joints shall be cleaned from the pipe and fittings immediately.

E. Screwed Connections

1. All screwed connections shall have full thread of true taper, accurate to gauge and conform to ANSI.

2. Screwed joints shall be made with an approved joint compound applied to the male thread only. Caulking of screwed joints shall not be allowed.

F. Soldering (Copper Tubing)

1. Tubing shall be cut with square ends and reamed to prevent burrs, out-of-round or improperly sized ends.

2. After cutting, all surfaces to be soldered shall be thoroughly cleaned to a metal-bright finish; free from dirt, grease, or other material before fluxing and soldering. This cleaning shall be performed by using emery cloth, sandpaper, or steel wool. Clean the outside end of the tubing for a length of 1/2-inch greater than the depth of the fitting. The inside of the fittings shall be cleaned in a similar manner. Apply flux and assemble the joint.

3. The surfaces to be joined shall be heated up slowly and uniformly to the melting point of the solder. The surface being soldered shall be maintained above the melting point of the solder for sufficient time to draw the solder completely into the joint. When the solder congeals to a plastic state, the excess metal shall be removed with a cloth brush, leaving a fillet around the end of the fitting. Full penetration of the solder uniformly throughout the entire socket is required. The soldered joints shall be allowed to cool in still air until only warm to the hand after which the work may be quenched.

4. Any type of crack, pinhole, area of incomplete penetration, or similar defect shall not be accepted. Peening for closing up defects shall not be permitted.

5. Heating torches of sufficient size shall be used for heating of large fittings prior to soldering. Multiple tips or ring burners for use on combination torches may be used.

6. Remove all external and internal loose solder and flux after joint cools.

G. Insulation

1. Do not apply insulation until pipes and tanks have been tested and accepted by all parties making inspection.

2. Replace insulation on existing water piping which is damaged during construction with new insulation at no additional cost to the Owner.

3. Insulation for plumbing piping. Insulation thickness shall be as follows:

Pipe Service	Insulation Thickness
All plumbing services as specifically noted on the plans	1-inch

4. Jacket for insulated piping shall be as follows:

Pipe Service	Jacket Material
TW, TWR, and PTW as specifically noted on the plans	Aluminum

3.02 INSTALLATION OF HANGERS AND SUPPORTS

A. In certain locations, pipe supports, anchors, guides, and expansion joints may be indicated on the Drawings. The Contractor shall be responsible to provide a complete system of supports, expansion joints, and anchors. Additional supports may be required adjacent to expansion joints, couplings, and valves or based on field conditions.

B. Provide a metal insulation shield at support points of insulated lines.

C. Unless otherwise shown on the Drawings, provide support for piping in accordance with the following maximum spans:

Pipe Material & Size	Maximum Horizontal Spacing (feet)	Maximum Vertical Spacing (feet)
Copper tubing (water service; 1.25-inch and smaller)	6	10
Copper tubing (water service; 1.5-inch and larger)	8	Every floor and 10'

3.03 INSTALLATION OF LABELS

A. Labels shall not be located more than 26 linear feet apart; and shall also appear directly adjacent to each side of any wall or floor the pipeline breaches, and all pieces of equipment.

B. Identification label locations shall be placed where the view is unobstructed and on the two lower quarters of pipe or covering where they are overhead. Label should be clearly visible from operating positions, especially those adjacent to control valves.

C. Unit numbers shall be mounted at eye level on machines where possible or at the upper most broad vertical surface of low equipment.

3.04 FIELD TESTING

A. Provide air and water necessary for testing the piping systems as specified under this Section of the work. Provide connections for testing under this Section. Remove debris resulting from testing. Use the water in an efficient and economical manner.

B. Provide apparatus and other supplies or materials which may be necessary for testing the systems and operating the apparatus during the period while tests of any kind are being made or for carrying out the work of the Contract.

C. The various piping systems shall be subjected to water, smoke, or air tests as noted and shall hold tight at pressures stated without extra pumping or water addition for the time intervals stated.

D. Additional tests, methods, or materials that may be required by the local ordinances and not specifically specified herein shall be made as directed by the Engineer or the local inspection authority.

E. Provide for repeated tests as necessary to make systems tight as required.

F. Test metal water piping as follows:

1. Test interior water piping to a water pressure of 150 psi to the lowest level and maintain this pressure without additional pumping for two hours.

3.05 CLEANING

A. At the completion of the work, clean all piping, fixtures, equipment, apparatus and exposed trim for same included in this Section and, where required, polish ready for use.

B. Thoroughly disinfect the new cold water (CW), high temperature hot water (HTHW), tepid water (TW) and tepid water return (TWR) systems with a solution of not less than 50 ppm of available chlorine. Allow the disinfecting solution to remain in the system for a period of three hours; after which time, open all valves and faucets and flush the system with clean water until the residual chlorine content is not greater than 0.2 ppm, unless otherwise directed.

END OF SECTION

This Page Intentionally Left Blank

SECTION 15450
PLUMBING - EQUIPMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor and materials required and install the Plumbing Equipment complete as specified herein and as shown on the Drawings.

1.02 RELATED WORK

A. Refer to Section 15400.

1.03 SUBMITTALS

A. Submit, in accordance with Sections 15400 and 01300, shop drawings, product data, materials of construction, and details of installation for all products.

B. In general, corrections or comments or lack thereof made relative to submittals during review shall not relieve the Contractor from compliance with the requirements of the drawings and specifications. Submittals are for review of general conformance with the design concepts of the project and general compliance with the Contract Documents. The Contractor is responsible for the final design conforming and correlating all quantities and dimensions, selecting fabrication process and techniques of construction, coordinating the work of all trades, and performing the work in a safe and satisfactory manner.

C. Include in the submittal a list of any exceptions to the specifications that are taken, and include any supporting documentation to justify the exception.

1.04 REFERENCE STANDARDS

A. Refer to Section 15400.

B. American National Standards Institute

1. Z358.1 – Emergency Eyewash and Shower Equipment.

1.05 QUALITY ASSURANCE

A. Refer to Section 15400.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 15400.

PART 2 PRODUCTS

2.01 GENERAL

A. The use of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.

B. Similar items of materials/equipment shall be the end products of one manufacturer in order to provide standardization for appearance, operation, maintenance, spare parts, and manufacturer's service.

C. Attention is particularly called to the fact that written approval of all specified equipment proposed for purchase shall be received from the Engineer before purchase of any equipment or components of the equipment.

D. All products and materials provided for potable water service shall be certified "lead-free" by an ANSI-certified, third-party independent organization. The term "lead-free" shall refer to the wetted surface of pipes, fittings, and fixtures in potable water systems that have a weighted average lead content less than or equal to 0.25 percent per the Safe Drinking Water Act (Section 1417) amended 1-4-2011 and other equivalent state regulations.

2.02 ATTACHMENTS

A. All equipment shall be provided with lugs, brackets, or field-supplied devices to allow all equipment to be firmly attached to the structure. Location of the attachments shall be based on the equipment being hung or base mounted as shown on the Drawings and the schedules.

2.03 WASH HOSE STATIONS

A. Refer to the plans for the hose rack requirements.

B. The hose shall be 75 feet of 3/4-inch commercial grade rubber and vinyl hose equal to Gilmour Model 840751.

C. The hose nozzle shall be a seven-pattern select-a-spray with vinyl grip. Unit shall include a hold-open clip for continuous spraying, a rust-resistant stainless steel spring, and a lifetime leak-proof seal; and be equal to Gilmour Model No. 594.

D. Wall anchors for the hose racks shall be 5/16-inch threaded stainless steel anchors with 5/16-inch stainless steel hex bolts.

2.04 CAUTION SIGN

A. At each WHS and hose bibb, provide a sign which states:

"WATER IS UNSAFE AND IS NOT TO BE USED FOR
DRINKING PURPOSES"

B. Sign shall conform to latest OSHA Regulations as to size, color, exact wording, type and height of letters.

2.05 PRESSURE GAUGES (PG)

A. Shall be 4-1/2-inch dial, phenolic turret case, micro-adjustable pointer and Type 316 stainless steel movement, solid front gauge.

B. Bourdon tube and connection shall be Type 316 stainless steel.

C. Accuracy shall be 1/2 percent of span.

D. Range shall be 0-100 psi.

E. All pressure gauges shall be fitted with a stop cock or ball valve.

F. Gauges shall be Ametek/U.S. Gauge Series 1900, similar unit by Ashcroft/Dresser, or equal.

2.06 EMERGENCY SHOWER THERMOSTATIC MIXING VALVE

A. Unit shall be designed to deliver 3 to 44 gpm of tepid water at an adjustable temperature range of 60 to 90 degrees F at a pressure loss of not more than 10 psi at 25 gpm.

B. Assembly shall be designed specifically for use with emergency showers and eyewash units and include safety features to limit high temperature of outlet water as well as a built-in cold water bypass in case of hot water failure.

C. Assembly shall include integral combination check stops or, alternately, individual checks and valves on the inlets; and a tepid water dial thermometer. The entire assembly shall be factory assembled and tested.

D. The basis of design is Guardian G3800LF. Manufacturer shall be Bradley, Guardian, Haws, Leonard, or equal.

2.07 HOT WATER RECIRCULATION PUMP

A. Refer to the plans for requirements.

B. Manufacturers shall be Bell and Gossett, Taco, or equal.

2.08 EMERGENCY SHOWER/EYE WASH UNIT

A. Provide a unit with a powder-coated cast aluminum or iron floor flange, UV-resistant plastic insulation jacket, foam insulation, and top supply connection.

B. Provide unit with a thermostatically-controlled heat trace circuit designed for freeze protection down to -20 degrees F ambient conditions. The heating system shall be rated for Class 1 Division 2 Group B, C, and D environments.

C. Provide eye wash spray heads with dust covers, flow limiting valves (0.2 gpm per head), and filters. Provide brass stay-open control valve, and stainless steel or powder-coated cast aluminum hand flag. Provide a proximity switch for remote monitoring.

D. Provide a stainless steel or plastic shower head with a 20 gpm flow limiting valve, brass stay-open control valve, and stainless steel actuator rod and handle. Provide a proximity switch for remote monitoring.

E. Provide a unit-mounted horn and strobe that are interlocked with the operation of the proximity switches. Provide an alarm contact that is energized by the proximity switches.

F. Provide the unit with a single point of power connection for the heat trace circuit, strobe, and horn.

G. Provide an ANSI-compliant identification sign. The unit shall be tested to comply with ANSI Z3581.

H. The basis of design is Guardian GFR3307. Manufacturer shall be Bradley, Guardian, Haws, or equal.

2.09 REDUCED PRESSURE ZONE BACKFLOW PREVENTER (RPZ)

A. Shall be of the size shown on the Drawings and body shall be constructed of bronze for sizes less than 2-1/2-inch, and epoxy coated cast iron for sizes 2-1/2-inch and larger.

B. Each unit shall be complete with two companion full bore ball valves equipped with test connections and inlet wye strainer. Valves shall be of similar material as that of the backflow device body, including epoxy coating. Unit shall have replaceable bronze seats and captured springs.

C. The basis of design is Watts LF909M1QTS. Manufacturer shall be Cla-Val Co., Febco, Watts, or equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install all the items specified under PART 2 according to the applicable manufacturer's instructions and the details shown on the Drawings.

B. Do not install any equipment or materials until the Owner and Engineer have approved all submittals. If any equipment or materials are installed prior to approval of the submittals, it shall be at the Contractor's risk.

C. Test the operation of the emergency shower mixing valve to confirm that the scheduled tepid water temperature is achieved.

3.02 CLEANING

A. Properly protect all materials and equipment at all times to prevent obstruction and damage. Maintain protective covers on all units until final clean-up time.

B. At the completion of the work, all equipment and exposed trim for the same included in this Section shall be thoroughly cleaned and, where required, polished ready for use.

END OF SECTION

SECTION 15950
ELECTRIC AUTOMATIC TEMPERATURE CONTROL SYSTEM

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Control system shall consist of all devices and other accessory equipment, along with a complete system of electrical wiring, to fill the intent of the specification and provide for a complete and operable system. Control equipment shall be fully proportioning, except as noted otherwise.

B. Control sequences shall be as shown on the Drawings.

1.02 RELATED WORK

A. Coordinate with Division 16 (Electrical) Contractor for wiring specifications, power sources, and area classifications.

B. Refer to Division 16 for wash hose station control panel wiring diagram.

C. Solenoid valves are included in other sections of Division 15.

1.03 SUBMITTALS

A. Submit, in accordance with Section 01300, shop drawings and product data for the following:

1. Control drawings with composite wiring diagrams, including bill of material and description of operation for all systems. Drawings shall be provided as 8.5-inch by 11-inch or 11-inch by 17-inch PDF files.

2. Panel layouts and nameplates lists for all local and central panels.

3. Data sheets for all control system components. When manufacturer's cut sheets apply to a product series rather than a specific product, the data specifically applicable to the project shall be highlighted or clearly indicated by other means. Each submittal piece of literature and drawing shall clearly reference the Specification and/or Drawings that the submittal is to cover. General catalogs shall not be accepted as cut sheets to fulfill submittal requirements.

4. Provide a recommended list of spare parts to be provided.

5. Complete listing of deviations from the system as specified.

6. For units that will be shipped exposed, provide a description of the protective packaging that will be used during transit.

7. Submittals shall contain a statement that Section 15400, this Section, and all other referenced Sections have been read and complied with. The certification statement shall be made by all of the following that are applicable: the Contractor, sub-contractor, and the

vendor. Statement shall be an individual statement for each party involved, and shall be included with every submittal and resubmittal.

B. In general, corrections or comments or lack thereof made relative to submittals during review shall not relieve Contractor from compliance with the requirements of the drawings and specifications. Submittals are for review of general conformance with the design concepts of the project and general compliance with the Contract Documents. Contractor is responsible for the final design conforming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating the work of all trades, and performing the work in a safe and satisfactory manner.

1.04 REFERENCE STANDARDS

A. National Fire Protection Association (NFPA).

1. NFPA 72 – National Fire Alarm Code

2. NFPA 90A – Standard for the Installation of Air Conditioning and Ventilating Systems

1.05 QUALITY ASSURANCE

A. Automatic Temperature Control (ATC) Subcontractor shall have a branch office facility within 100 miles of the project for at least five years, with technical staff and complete spare parts inventory and test and diagnostic equipment to keep systems in operation 24 hours per day, seven days per week. ATC Subcontractor shall have emergency service available in the local area for temperature control systems for which they are currently performing on-call emergency service 24 hours per day, seven days per week with a maximum response time of four hours.

B. ATC Subcontractor shall have in their direct employ personnel capable of detailed engineering, coordination, drafting, procurement, expediting, construction scheduling, testing, inspection, installation, startup, calibration, and commissioning.

C. Equipment to be furnished under this Section shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, they shall be the product of a single manufacturer; however, all component parts of the system need not be products of one manufacturer.

D. Several manufacturers are indicated as acceptable for some items of equipment in these specifications. ATC Subcontractor shall be responsible for determining that all equipment supplied for this project is suitable for installation and proper operation in the space provided with fully adequate operating and maintenance access space.

E. Inspection by the Engineer's representative, or failure to inspect, shall not relieve ATC Subcontractor of responsibility to provide materials and perform the work in accordance with the documents.

F. Owner and Engineer reserve the right to sample and test any materials after delivery, and to reject components represented by a sample that fails to comply with the specified requirements.

G. Materials and equipment used shall be standard components, regularly manufactured for this and/or other systems, and not custom designed especially for this project. Systems and components shall have been thoroughly tested and proven in actual use.

1.06 COORDINATION

A. ATC Subcontractor shall assume full responsibility for the coordination of the work of this Section with that of the other sections to accomplish the requirements as indicated on the construction drawings and as specified.

B. ATC Subcontractor shall furnish, install, supervise, and test the field wiring associated with the work of this Section; and shall be responsible to coordinate the installation of controls with the other Divisions.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be inspected for size, quality, and quantity against approved Shop Drawings upon delivery.

B. Delivery schedule of all equipment shall be coordinated with the Contractor. Equipment ready for shipment prior to the agreed-on shipping date shall be stored without cost to the Owner by the manufacturer.

C. Materials shall be suitably packed for shipment and long-term storage. Each package shall be labeled to indicate the project and the contents of each package. Where applicable, equipment numbers shall be marked on the container.

D. Equipment shipped that is exposed, such as on a flatbed truck, shall be protected during transit. Equipment shall be protected from moisture, road salt, dirt, stones or other materials thrown up from other vehicles. Electrical components shall be protected as above, but with special attention to moisture. Method of shipment protection shall be defined in the submittals.

E. Instructions for servicing and startup of equipment in long-term or prolonged storage shall accompany each item.

F. Materials shall be stored in a covered dry location off of the ground. When required to protect the materials they shall be stored in a temperature-controlled location.

1.08 ENVIRONMENT

A. Components shall be suitable for operating in a normal plant environment without requirements for special temperature and humidity control.

1.09 SPARE PARTS

A. Spare parts shall include all special items on the manufacturer's standard list of spare parts.

B. Pack spare parts in containers suitable for extended storage without deterioration of the parts. Containers shall be clearly labeled designating contents, pieces of equipment for which intended, and equipment identification numbers.

1.10 UL LISTING

A. Materials, equipment, and system components of the HVAC system shall be UL Listed. If factory UL listing of all system components is not available, the manufacturer shall include in their scope of supply all expenses associated with getting the complete installation UL field labeled by a UL representative. This includes all hourly or per diem costs and expenses of the UL representative, all costs to bring the system or specific components within UL field labeling compliance, and all costs of the manufacturer's representative.

PART 2 PRODUCTS

2.01 MATERIALS

A. Products and materials used in this project shall be new and currently under manufacture and shall have been applied in similar installations for a minimum of two years. This installation shall not be used as a test site for any new products unless explicitly approved in writing.

2.02 ATC FIELD EQUIPMENT

A. Recirculation Pump Controller (Water Low Temperature Switch): UL listed, remote bulb style, one SPDT contact that operates on rising temperature, contacts rated for 16A at 120 VAC, -30 to 100 degree F range, adjustable setpoint, 3 to 12 degree adjustable differential, 8-ft. capillary. Furnish a matching bulb thermowell. The basis of design is JCI A19ABC-24C.

B. Water Freezestat: UL listed, remote bulb style, one SPDT contact that operates on falling temperature, contacts rated for 6A at 120 VAC, 30 to 50 degree F range, adjustable setpoint, fixed differential, 6-ft. capillary. Furnish a matching bulb thermowell. The basis of design is JCI A19AAD-5C.

C. Wash Hose Station Control Panels

1. Controllers, relays, switches, power supplies, etc., for equipment shall be mounted within control panels with hinge lock type doors.

2. Details and wiring diagrams for each control panel shall be submitted for approval prior to fabrication.

3. Electrical devices within the panels shall be wired to a numbered terminal strip. Wiring within the panel shall be in accordance with NEMA and UL standards, and shall meet all local codes.

4. Panels shall be provided with lugs or brackets to allow the panel to be firmly fastened to the structure.

5. Provide a copy of the wiring and control diagram for all work in each panel. The diagram shall be stored in a pocket on the door.

D. Miscellaneous Devices: Provide necessary relays, power supplies, transformers, etc., to make a complete and operable system.

E. Set points on devices shown on the Drawings are indicative only and shall be adjustable above and below such set points. If a set point is not stated, the control range of devices shall be suitable for the intended service. Range of devices shall be approximately 50 percent greater in both directions than span of variable, with a minimum of 25 degrees and a maximum of 100 degrees F for air systems.

2.03 ELECTRIC WIRING

A. Field wiring and conduit furnished under this Section shall conform to the requirements of Division 16.

B. Low-voltage wiring shall meet NEC Class 2 requirements. Low-voltage power circuits shall be subfused when required to meet Class 2 current limit.

C. Size of conduit and size and type of wire shall be the responsibility of the Contractor, in keeping with the manufacturer's recommendations and code requirements, except as noted elsewhere.

2.04 WARNING LABELS

A. Permanent warning labels shall be affixed to all equipment that can be automatically started by the control system.

1. Labels shall use white lettering (14-point type or larger) on a red background.

2. Warning labels shall read as follows:

C A U T I O N
THIS EQUIPMENT IS OPERATING UNDER AUTOMATIC CONTROL AND MAY START OR STOP AT ANY TIME WITHOUT WARNING. SWITCH DISCONNECT TO "OFF" POSITION BEFORE SERVICING.

PART 3 EXECUTION

3.01 GENERAL INSTALLATION

A. Contractor shall not install any equipment or materials until the Owner and Engineer have approved all submittals. If any equipment or materials are installed prior to approval of the submittals, it shall be at Contractor's risk.

3.02 WIRING INSTALLATION

A. Installation of all conduit, wire, sleeves, outlet boxes, insulating bushings, system cabinets, terminal boxes, pull boxes, junction boxes, inserts, anchors, system devices, etc., shall be in accordance with the appropriate requirements of Division 16, and in accordance with sections of the current edition of the local codes for signal systems and electrical systems.

B. In the event of any conflict among referenced codes, current editions of the applicable local codes shall take precedence for interpretation of "Signal System" installation requirements.

C. Do not install Class 2 wiring in conduit containing Class 1 wiring. Boxes and panels containing high voltage wiring and equipment may not be used for low voltage wiring except for the purpose of interfacing the two (e.g., relays and transformers).

D. Wire to device connections shall be made at a screw type terminal block or screw type terminal strip. Wire to wire connections shall be at a screw type terminal block.

E. Wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.

F. Wiring shall be installed as continuous lengths with no splices permitted between termination points.

G. Include one pull string in each conduit (1-inch) or larger.

H. Use coded conductors throughout with conductors of different colors.

I. Install conduits to maintain a clearance of 6-inch from high temperature equipment.

J. Secure conduits with conduit clamps fastened to the structure and spaced accordingly to code requirements. Conduits and pull boxes may not be hung on flexible duct strap or tie rods. Conduits may not be run on or attached to ductwork.

K. Comply with Division 16 requirements where conduit crosses building expansion joints.

L. Install insulated bushings on all conduit ends and openings to enclosures. Seal top end of all vertical conduits.

M. Contractor shall terminate all control and/or interlock wiring and shall maintain updated (as-built) wiring diagrams with terminations identified at the job site.

N. Flexible metal conduits and liquid tight, flexible metal conduits shall not exceed 3-ft. in length and shall be supported at each end. Flexible metal conduits less than 1/2-inch electrical trade size shall not be used. In areas exposed to moisture, including chiller and boiler rooms, liquid tight, flexible metal conduits shall be used.

O. Conduits shall be rigidly installed, adequately supported, properly reamed at both ends, and left clean and free of obstructions. Conduit sections shall be joined with couplings (according to code). Terminations must be made with fittings at boxes.

3.03 INSTRUCTION AND ADJUSTMENT

A. Upon completion of the project:

1. Adjust and calibrate all devices provided under this Section.

2. A competent technician shall be provided for a period of four hours for instruction purposes. If the Owner requests the services of the technician beyond the four-hour period, the Owner shall pay a per diem charge which is to be included in the proposal for such services.

B. ATC Subcontractor shall provide complete system documentation at acceptance time. Documentation shall be provided in four sets unless otherwise elsewhere in this Section. Documentation shall include the following:

1. Data specified in the submittal paragraph above, in its final as-built approved form.

2. As-built interconnection wiring diagrams, wire lists, or list of the complete field installed system with complete, properly identified, ordering number of each system component and device.

3.04 IDENTIFICATION OF HARDWARE AND WIRING

A. Wiring and cabling, including that within factory-fabricated panels, shall be labeled at each end within 2-inch of termination with the address or termination number.

B. Permanently label or code each point of field terminal strips to show the instrument or item served.

C. Identify all other control components with permanent labels. All plug-in components shall be labeled such that removal of the component does not remove the label.

D. Manufacturer's nameplate and UL labels shall be visible and legible after equipment is installed.

E. Identifiers shall match record documents.

END OF SECTION

This Page Intentionally Left Blank

SECTION 16020
ELECTRICAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials and equipment required to install complete and make operational, electrical and process instrumentation systems as specified, as shown on the Drawings.

B. The work shall include furnishing and installing the following:

1. Conduit, wire and field connections for all motors, motor controllers, control devices, control panels and electrical equipment furnished under other Divisions of these Specifications.

2. Conduit, wiring and terminations for all field-mounted instruments furnished and mounted under other Divisions of these Specifications, including process instrumentation primary elements, transmitters, local indicators and control panels. Lightning and surge protection equipment wiring at process instrumentation transmitters. Install vendor furnished cables specified under other Divisions of these Specifications.

3. Grounding System.

C. Each bidder or their authorized representatives shall, before preparing their proposal, visit all areas of the existing buildings and structures in which work under this sub-bid [bid] is to be performed and inspect carefully the present installation. The submission of the proposal by this bidder shall be considered evidence that they have visited the site, buildings and structures and noted the locations and conditions under which the work will be performed and that they take full responsibility for a complete knowledge of all factors governing his/her work.

1.02 RELATED WORK

A. Except for directly controlled, single phase, unit heater thermostat wiring and all interlocking and termination wiring within the motor starter/motor control centers, all automatic temperature control wiring for heating, ventilating and air conditioning equipment (thermostats, duct switches, P-E switches, dampers, automatic temperature control panels, etc.) will be furnished and installed as indicated on the Drawings.

B. Refer to the Architectural floor plans for room and building dimensions.

1.03 SUBMITTALS

A. Submit, in accordance with Section 01300, shop drawings for equipment, materials and other items furnished under Division 16.

B. Check shop drawings for accuracy and contract requirements prior to submittal. Shop drawings shall be stamped with the date checked and a statement indicating that the shop drawings conform to Specifications and Drawings. This statement shall also list all exceptions to the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.

C. The Engineer's check shall be for conformance with the design concept of the project and compliance with the Specifications and Drawings. Errors and omissions on approved shop drawings shall not relieve the Contractor from the responsibility of providing materials and workmanship required by the Specifications and Drawings.

D. All dimensions shall be field verified at the job site and coordinated with the work of all other trades.

E. Material shall not be ordered or shipped until the shop drawings have been approved. No material shall be ordered or shop work started if shop drawings are marked "APPROVED AS NOTED - CONFIRM," "APPROVED AS NOTED - RESUBMIT" or "NOT APPROVED."

1.04 CONTRACT PERFORMANCE REQUIREMENTS

A. Electric equipment, materials and installation shall comply with the latest edition of the National Electrical Code (NEC) and with the latest edition of the following codes and standards:

1. National Electrical Safety Code (NESC).

2. Occupational Safety and Health Administration (OSHA).

3. National Fire Protection Association (NFPA).

4. National Electrical Manufacturers Association (NEMA).

5. American National Standards Institute (ANSI).

6. Insulated Cable Engineers Association (ICEA).

7. Instrument Society of America (ISA).

8. Underwriters Laboratories (UL).

9. Factory Mutual (FM).

10. National Electrical Testing Association (NETA).

11. IEEE Standard 519 - "Guide for Harmonic Control and Reactive Compensation of Static Power Converters."

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. A factory authorized service and parts organization shall be located within 100 miles of the project location. Provide the name and address of the factory authorized service and parts organization nearest to the project location at the time of the bid.

B. Equipment shall be UL or ETL labeled.

1.06 PRIORITY OF THE CONTRACT DOCUMENTS

A. If, during the performance of the work, the Contractor finds a conflict, error or discrepancy between or among one or more of the Sections or between or among one or more Sections and the Drawings, furnish the higher performance requirements. The higher performance requirement shall be considered the equipment, material, device or installation method which represents the most stringent option, the highest quality or the largest quantity.

B. In all cases, figured dimensions shall govern over scaled dimensions, but work not dimensioned shall be as directed by the Engineer and work not particularly shown, identified, sized, or located shall be the same as similar work that is shown or specified.

C. Detailed Drawings shall govern over general drawings, larger scale Drawings take precedence over smaller scale Drawings, Change Order Drawings shall govern over Contract Drawings and Contract Drawings shall govern over Shop Drawings.

D. If the issue of priority is due to a conflict or discrepancy between the provisions of the Contract Documents and any referenced standard, or code of any technical society, organization or association, the provisions of the Contract Documents will take precedence if they are more stringent or presumptively cause a higher level of performance. If there is any conflict or discrepancy between standard specifications, or codes of any technical society, organization or association, or between Laws and Regulations, the higher performance requirement shall be binding on the Contractor, unless otherwise directed by the Engineer.

E. In accordance with the intent of the Contract Documents, the Contractor accepts the fact that compliance with the priority order specified shall not justify an increase in Contract Price or an extension in Contract Time nor limit in any way, the Contractor's responsibility to comply with all Laws and Regulations at all times.

1.07 ENCLOSURE TYPES

A. Unless otherwise specified electrical enclosures shall have the following ratings:

1. NEMA 1 for dry, non-process indoor above grade locations.

2. NEMA 3R for outdoor non-corrosive areas.

3. NEMA 12 for indoor above grade locations within the Administration Building.

4. NEMA 4 for outdoor locations, rooms below grade (including basements and buried vaults).

5. NEMA 4X for all equipment located in the Tipping Building.

1.08 TESTS AND SETTINGS

A. Test systems and equipment furnished under Division 16 and repair or replace all defective work and equipment. Refer to the individual equipment sections for additional specific testing requirements.

B. Make adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

C. In addition to the specific testing requirements listed in the individual sections, the following minimum tests and settings shall be performed.

1. Mechanical inspection, testing and settings of circuit breakers, disconnect switches, protection relays, motor starters, overload relays, control circuits and equipment for proper operation.

2. Check the full load current draw of each motor. Where power factor correction capacitors are provided, the capacitor shall be in the circuit at the time of the measurement. Check ampere rating of thermal overloads for motors and submit a typed record to the Engineer of the same, including driven load designation, motor service factor, horsepower, and Code letter. If incorrect thermal overloads are installed replace same with the correct size overload.

3. Check power and control power fuse ratings. Replace fuses if they are found to be of the incorrect size.

4. Check settings of the motor circuit protectors. Adjust settings to lowest setting that will allow the motor to be started when under load conditions.

5. Check motor nameplates for correct phase and voltage. Check bearings for proper lubrication.

6. Check rotation of motors prior to testing the driven load. Disconnect the driven equipment if damage could occur due to wrong rotation. If the rotation is for the driven equipment is not correct, disconnect the motor lead connections at the motor terminal box and reconnect for proper rotation.

7. Check interlocking, control and instrument wiring for each system and/or part of a system to prove that the system will function properly as indicated by control schematic and wiring diagrams.

8. Verify all terminations at transformers, equipment, panels and enclosures by producing a 1, 2, 3 rotation on a phase sequenced motor when connected to "A," "B" and "C" phases.

9. Test the grounding system using the three point fall in potential method.

10. Test all 600 Volt wire insulation with a meg-ohm meter after installation. Make tests at not less than 500V. Submit a written test report of the results to the Engineer.

D. Testing shall be scheduled and coordinated with the Owner at least two weeks in advance. Provide qualified test personnel, instruments and test equipment.

1.09 SIZE OF EQUIPMENT

A. Investigate each space in the structure through which equipment must pass to reach its final location. Coordinate shipping splits with the manufacturer to permit safe handling and passage through restricted areas in the structure.

B. The equipment shall be kept upright at all times during storage and handling. When equipment must be tilted for passage through restricted areas, brace the equipment to ensure that the tilting does not impair the functional integrity of the equipment.

1.10 RECORD DRAWINGS

A. As the work progresses, legibly record all field changes on a set of project contract drawings, hereinafter called the "record drawings."

B. Record drawings shall accurately show the installed condition of the following items:

1. One-line Diagram(s).

2. Raceways and pull boxes.

3. Conductor sizes and conduit fills.

4. Panel Schedule(s).

5. Control Wiring Diagram(s).

6. Plan view, sizes and locations of distribution transformers, and panelboards.

C. Submit a schedule of control wiring raceways and wire numbers, including the following information:

1. Circuit origin, destination and wire numbers.

2. Field wiring terminal strip names and numbers.

D. As an alternate, point-to-point connection diagrams showing the same information may be submitted in place of the schedule of control wiring raceways and wire numbers.

E. Submit the record drawings and the schedule of control wiring raceways and wire numbers (or the point-to-point connection diagram) to the Owner.

1.11 EQUIPMENT INTERCONNECTIONS

A. Review shop drawings of equipment furnished under other Divisions of this Specification and prepare coordinated wiring interconnection diagrams or wiring tables. Submit copies of wiring diagrams or tables with Record Drawings.

B. Furnish and install all equipment interconnections.

1.12 MATERIALS AND EQUIPMENT

A. Materials and equipment shall be new.

B. Material and equipment of the same type shall be the product of one manufacturer and shall be UL listed.

C. Refer to individual equipment Sections for additional warranty items.

1.13 EQUIPMENT IDENTIFICATION

A. Identify equipment (disconnect switches, separately mounted motor starters, control stations, etc.) furnished under Division 16 with the name of the equipment it serves. Motor control centers, control panels, panelboards, junction or terminal boxes, etc., shall have nameplate designations as shown on the Drawings.

B. Nameplates shall be engraved, laminated plastic, not less than 1/16-in thick by 3/4-in by 2-1/2-in with 3/16-in high white letters on a black background.

C. Nameplates shall be screw mounted to NEMA 1 enclosures. Nameplates shall be bonded to all other enclosure types using an epoxy or similar permanent waterproof adhesive. Two sided foam adhesive tape is not acceptable. Where the equipment size does not have space for mounting a nameplate the nameplate shall be permanently fastened to the adjacent mounting surface.

1.14 INTERPRETATION OF DRAWINGS

A. Unless specifically stated to the contrary, the Drawings are not intended to show exact locations of conduit runs. Coordinate the conduit installation with other trades and the actual supplied equipment.

B. Install each 3-phase circuit in a separate conduit, unless otherwise shown on the Drawings.

C. Unless otherwise approved by the Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.

D. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation. Where home-runs indicate, conduit is to be installed concealed or exposed the entire branch circuit shall be installed in the same manner. Unless otherwise indicated, install branch circuit conduits exposed in process/industrial type spaces and concealed in finished spaces.

E. Except where dimensions are shown, the locations of equipment, outlets and similar devices shown on the Drawings are approximate only. Exact locations shall be determined by the Contractor and approved by the Engineer during construction. Obtain information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

F. Circuit layouts are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting and other electrical systems shown.

G. Redesign of electrical or mechanical work, which is required due to the Contractor's use of an alternate item, arrangement of equipment and/or layout other than specified herein, shall be done by the Contractor at his/her own expense. Redesign and detailed plans shall be submitted to the Engineer for approval. No additional compensation will be provided for changes in the work, either his/her own or others, caused by such redesign.

H. Raceways and conductors for low voltage (120 Volts) thermostats controlling HVAC unit heaters, exhaust fans, heat trace and similar equipment are not shown on the Drawings. Provide raceways and conductors between the thermostats, the HVAC equipment and the motor starters or heat trace controllers for a complete and operating system. Raceways shall be installed concealed in all finished space and may be installed concealed or exposed in process spaces. Refer to the Electrical for the locations of the heat trace thermostats and temperature controllers.

I. It is the intent of these Specifications that the Electrical Systems shall be suitable in every way for the service required. All materials and all work that may be implied as being incidental to the work of this Section shall be furnished at no additional cost to the Owner.

J. Raceways and conductors for receptacles and other miscellaneous low voltage power and signal systems as specified are not shown on the Drawings. Raceways and conductors shall be provided as required for a complete and operating system. Homeruns, as shown on the Drawings, are to assist the Contractor in identifying raceways to be run exposed and raceways to be run concealed. Raceways shall be installed concealed in all finished spaces and may be installed exposed or concealed in all process spaces. Raceways installed exposed shall be near the ceiling or along walls of the areas through which they pass and shall be routed to avoid conflicts with HVAC ducts, cranes hoists, monorails, equipment hatches, doors, windows, etc. Raceways installed concealed shall be run in the center of concrete floor slabs, above suspended ceilings, or in partitions as required.

1.15 SEISMIC RESTRAINTS

A. Seismic restraints shall be provided for all electrical systems including but not limited to conduits, busways, cable trays, pull boxes, free standing or wall mounted panels and cabinets, motor control centers, transformers, disconnect switches, individually mounted motor starters and other similar electrical equipment installed under Division 16.

B. Use seismic criteria, Tables and standard restraint details found in the latest edition of the SMACNA Seismic Retraining Manual for the seismic restraints. The restraints shall be selected from the Tables that represent the highest seismic hazard class or level possible within the State, Commonwealth or District in which the project resides. Where materials other than steel are specified, members of equal strength to those in the standards shall be provided.

C. Materials of construction for seismic restraints shall be same as those specified for the equipment supports and area classifications. However, all bolts shall be stainless steel regardless of the locations.

PART 2 PRODUCTS

2.01 CONDUITS AND FITTING

A. Rigid Steel Conduit:

1. Rigid steel conduit interior and exterior shall be hot-dipped galvanized and be as manufactured by the Allied Tube and Conduit Corp.; Wheatland Tube Co.; Western Tube & Conduit Corporation, or equal.

B. PVC Coated Rigid Steel Conduit:

1. PVC coated rigid steel conduit shall have a minimum 0.040-in thick, polyvinyl chloride coating permanently bonded to hot-dipped galvanized steel conduit and an internal chemically cured urethane or enamel coating. The ends of all couplings, fittings, etc., shall have a minimum of one pipe diameter in length of PVC overlap. PVC conduit and fittings shall be manufactured by Occidental Coating Company; "Plasti-Bond Red" as manufactured by Robroy Industries; "Ocal" by Thomas & Betts Inc., Perma-Cote, or equal.

C. Rigid Aluminum Conduit:

1. Rigid aluminum conduit shall be 6063 alloy and shall be as manufactured by American Conduit by SAPA, Wheatland Tube, AFC Co., or equal.

D. Intermediate Metal Conduit:

1. Intermediate metal conduit shall be hot-dipped or electro-galvanized steel as manufactured by Allied Tube and Conduit Corp.; Triangle PWC Inc.; Wheatland Tube Co., or equal.

E. Rigid Nonmetallic Conduit:

1. PVC conduit shall be rigid polyvinyl chloride schedule 40 and 80 as manufactured by Carlon; An Indian Head Co.; Kraloy Products Co., Inc.; Highland Plastics Inc., or equal.

F. Liquidtight Flexible Metal Conduit, Couplings and Fittings:

1. Liquidtight flexible metal conduit shall be Sealtite, Type UA, manufactured by the Anaconda Metal Hose Div.; Anaconda American Brass Co.; American Flexible Conduit Co., Inc.; Universal Metal Hose Co., or equal.

2. Fittings used with liquidtight flexible metal conduit shall be of the screw-in type as manufactured by the Thomas & Betts Co.; Crouse-Hinds Co., or equal.

G. Flexible Couplings:

1. Flexible couplings shall be type ECGJH as manufactured by the Crouse-Hinds Co.; Appleton Electric Co.; Killark Electric Manufacturing Co., or equal.

H. Boxes and Fittings:

1. Pressed steel switch and outlet boxes shall be hot-dipped galvanized as manufactured by the Raco Manufacturing Co.; Adalet Co.; O.Z. Manufacturing Co., or equal.

2. For use in NEMA 1 areas, terminal boxes, junction boxes, pull boxes etc., shall be galvanized sheet steel with continuously welded seams. Box bodies shall be flanged and shall not have holes or knockouts. Box bodies shall not be less than 14-gauge metal and covers shall not be less than 12-gauge metal. Covers shall be gasketed and fastened with stainless steel screws. Terminal boxes shall be furnished with hinged doors, terminal mounting straps and brackets. Terminal blocks shall be NEMA type, not less than 20 Amps, 600 Volt. Boxes shall be as manufactured by Hoffman Engineering Co.; Lee Products Co.; Keystone/Rees, Inc., or equal.

3. NEMA 4 terminal boxes, junction boxes, pull boxes, etc., shall be sheet stainless steel unless otherwise shown on the Drawings. Boxes shall have continuously welded seams and mounting feet. Welds shall be ground smooth. Boxes shall be flanged and shall not have holes or knockouts. Box bodies shall not be less than 14-gauge metal and covers shall not be less than 12-gauge metal. Covers shall have a continuous gasket on all four sides and be fastened with stainless steel clamps. Terminal boxes shall be furnished with hinged doors, terminal mounting straps and brackets. Terminal blocks shall be NEMA type, not less than 20 Amp, 600 Volt. Boxes shall be as manufactured by Hoffman Engineering Co.; Lee Products Co.; Keystone/Rees, Inc., or equal.

4. NEMA 4X terminal boxes, junction boxes and pull boxes shall be fiberglass reinforced plastic with stainless steel hardware and covers having a continuous gasket on all four sides. Terminal boxes shall be furnished with hinged doors, terminal mounting straps and brackets. Terminal blocks shall be NEMA type, not less than 20 Amps, 600 Volt. Boxes shall be as manufactured by Hoffman Engineering Co.; Lee Products Co.; Keystone/Rees, Inc., or equal.

5. All boxes and fittings used with PVC coated conduit shall be furnished with a PVC coating bonded to the metal, the same thickness as used on the coated steel conduit. The ends of couplings and fittings shall have a minimum of one pipe diameter PVC overlap to cover threads and provide a seal.

6. Cast or malleable iron device boxes shall be Type FD. All cast or malleable iron boxes and fittings shall have cadmium-zinc finish with cast covers and stainless steel screws as manufactured by the Crouse-Hinds Co., or equal.

7. Cast aluminum device boxes shall be Type FD. All cast aluminum boxes and fittings shall be copper-free aluminum with cast aluminum covers and stainless steel screws as manufactured by the Killark Electric Co.; Crouse-Hinds Co.; L. E. Mason Co., or equal.

8. Steel elbows and couplings shall be hot-dipped galvanized. Elbows and couplings used with PVC coated conduit shall be furnished with a PVC coating bonded to the steel, the same thickness as used on the coated steel conduit.

9. Conduit hubs shall be as manufactured by Myers Electric Products, Inc. or equal.

10. Conduit wall and floor seals for sleeved openings shall be type CSMI as manufactured by the O.Z./Gedney Co.; or equal.

11. Conduit sealing bushings shall be O.Z./Gedney Type CSB or equal.

12. Combination expansion-deflection fittings embedded in concrete shall be Type XD as manufactured by Crouse-Hinds Co.; Type AXDX as manufactured by O.Z./Gedney Co. Type DF as manufactured by Appleton Electric Co., or equal.

13. Combination expansion-deflection fittings installed exposed shall be Type XD as manufactured by Crouse-Hinds Co.; Type AXDX as manufactured by O.Z./Gedney Co. Type DF as manufactured by Appleton Electric Co., or equal.

I. Conduit Mounting Equipment:

1. In dry indoor areas, hangers, rods, back plates, beam clamps, channel, etc. shall be galvanized iron or steel.

2. PVC coated steel channel with stainless steel hardware shall be used in areas designated "WET" and "CORROSIVE" on the Drawings and in outdoor locations. Fiberglass channel shall be resistant to the chemicals present in the area in which it is used.

J. Wall and Floor Slab Opening Seals:

1. Wall and floor slab openings shall be sealed with "FLAME-SAFE" as manufactured by the Thomas & Betts Corp.; Pro Set Systems; Neer Mfg. Co.; Specified Technologies, Inc., or equal.

K. Cold Galvanizing Compound:

1. Cold galvanizing compound shall be as manufactured by ZRC Products Company, a division of Norfolk Corp., or equal.

TABLE 2.01-1
Raceway Application Guidelines

(i) Location/Circuit Type	(ii) Raceway Type
All locations - raceways containing circuits above 600 Volts.	▪ Exposed (non-process areas) - Galvanized rigid steel (GRS) conduit. ▪ Concealed - Do not embed within structure. If this is not possible, use Schedule 40 PVC conduit. ▪ Underground - PVC duct (as specified) in concrete reinforced duct bank. ▪ Avoid running through corrosive locations.
All locations ▪ Class 2 and 3 signal wiring and 4-20 mA instrumentation cables, non-fiber (copper) data highway. ▪ Communications system wiring	▪ Exposed - Galvanized rigid steel (GRS) conduit. Use PVC coated rigid steel conduit in corrosive areas. Hazardous areas, areas designated as wet and outdoor areas. ▪ Concealed - Galvanized rigid steel (GRS) conduit. ▪ Underground - Galvanized rigid steel (GRS) conduit in concrete reinforced ductbank. Use PVC coated steel conduit for single conduit direct burial applications. ▪ All locations not subject to physical damage and not in contact with concrete with engineer's prior approval – Rigid aluminum. Contractor must verify required size of conduit for intended wiring.
All locations ▪ Fiber Optic wiring systems (Fire alarm, security, and communications system wiring)	▪ Exposed - Galvanized rigid steel (GRS) conduit. ▪ Concealed - Schedule 40 PVC conduit. ▪ Underground – Schedule 40 PVC conduit in concrete reinforced duct bank. ▪ Direct Burial applications (where specifically shown on the Drawings) –PVC coated steel conduit ▪ All locations not subject to physical damage and not in contact with concrete with engineer's prior approval – Rigid aluminum. Contractor must verify required size of conduit for intended wiring.
Clean, dry finished areas - offices, administrative areas, lobbies, control room, lunch room, toilets, and laboratories, etc.	▪ Conceal raceways in walls above hung ceilings in rooms and areas that have finished interiors. Surface raceway for multiple receptacle, voice, and data outlets in labs and control rooms or in offices where specified. ▪ 3/4 or 1-in Galvanized rigid steel (GRS) for lighting, switch, and receptacle circuits exposed above hung ceilings or concealed in partition walls. Galvanized rigid steel (GRS) above 1-in. ▪ Flexible, armor interlocked cable assembly (Type MC) or flexible conduit may be used as branch circuit wiring in these areas. ▪ All locations not subject to physical damage and not in contact with concrete with engineer's prior approval – Rigid aluminum. Contractor must verify required size of conduit for intended wiring.

TABLE 2.01-1
Raceway Application Guidelines

(i) Location/Circuit Type	(ii) Raceway Type
Clean, dry non-finished areas - electrical rooms, generator rooms, mechanical rooms, shops, dry storage, etc.	▪ Exposed conduit for power wiring, lighting, switch, and receptacle circuits - Galvanized rigid steel (GRS). ▪ Concealed conduit for power wiring, lighting, switch, and receptacle circuits - Schedule 40 PVC conduit when embedded within concrete floor slabs. GRS when embedded within masonry block walls. ▪ All locations not subject to physical damage and not in contact with concrete with engineer's prior approval – Rigid aluminum. Contractor must verify required size of conduit for intended wiring.
Process areas - non-corrosive, non-hazardous locations designated as DAMP or WET on the Drawings.	▪ Exposed conduit for power wiring, lighting, switch, and receptacle circuits PVC coated steel conduit. ▪ Concealed conduit for power wiring, lighting, switch, and receptacle circuits - Schedule 40 PVC conduit when embedded within concrete floor slabs. GRS when embedded within masonry block walls. ▪ All locations not subject to physical damage and not in contact with concrete with engineer's prior approval – Rigid aluminum. Contractor must verify required size of conduit for intended wiring.
Corrosive areas - chemical storage and handling areas, underground vaults, within tanks or clearwells, filter pipe galleries and locations where designated corrosive on the Drawings.	▪ Exposed conduit for power wiring, lighting, switch, and receptacle circuits – PVC coated rigid steel. ▪ Concealed conduit for power wiring, lighting, switch, and receptacle circuits - Schedule 40 PVC conduit when embedded within concrete floor slabs or structures. ▪ All locations not subject to physical damage and not in contact with concrete with engineer's prior approval – Rigid aluminum. Contractor must verify required size of conduit for intended wiring.
Outdoor areas - all locations.	▪ Exposed conduit for power wiring, lighting, switch, and receptacle circuits - rigid aluminum. PVC conduit shall not be used exposed. ▪ Concealed conduit for power wiring, lighting, switch, and receptacle circuits - Schedule 40 PVC conduit when embedded within concrete structures. ▪ Conduits for medium voltage wiring (over 600V) – RMC or PVC coated RMC. ▪ Conduits installed under slab to be PVC coated RMC. ▪ Conduits for all instrumentation wiring - RMC or PVC coated RMC. All locations not subject to physical damage and not in contact with concrete with engineer's prior approval – Rigid aluminum. Contractor must verify required size of conduit for intended wiring.

2.02 WIRE, CABLE AND ACCESSORIES

A. Wires and cables shall be of annealed, 98 percent conductivity, soft drawn copper.

B. All conductors shall be stranded, except that lighting and receptacle wiring may be solid.

C. Except for control, signal, and instrumentation circuits, wire smaller than No. 12 AWG shall not be used.

D. Wire for lighting, receptacles and other circuits not exceeding 150 Volts to ground shall be NEC Type THHN/THWN as manufactured by Okonite Co.; Southwire Co.; Pirelli Corp., or equal.

E. Wire for circuits over 150 Volts to ground shall be NEC type XHHW-2 for sizes up to No. 4/0 AWG and Type RHW-2 for sizes greater than No. 4/0 AWG as manufactured by Okonite Co.; Southwire Co., or equal.

F. Wire for control, status and alarm circuits shall be No.14 AWG NEC type THHN/THWN, stranded as manufactured by the Okonite Co.; Carol Cable Co. Inc. West; Pirelli Cable Corp., or equal.

G. Multi-conductor control and power cables shall have stranded conductors with type THHN/THWN insulated, nylon conductor covering, and an overall PVC jacket covering the individual wires. Cable shall be TC rated meeting UL 1277 and IEEE 383 Standards. Cable shall be flame resistant, non-propagating and suitable for installation in a Class I, Division II hazardous location and for direct burial in earth. Power and control cables shall be furnished with a green ground conductor. Power cables shall be furnished with a white neutral conductor where required to serve phase to neutral loads. Cable shall be as manufactured by the Okonite Co.; Southwire Co.; General Cable Co., or equal.

H. Wire for process instrumentation signals (i.e., 1-5 VDC, 4-20 mA), R.T.D., potentiometer and similar signals shall be:

1. Single pair cable:
   a. Conductors: 2 No. 16 stranded and twisted on 2-in lay.
   b. Insulation: XLPE with 600 Volt, 105 degrees C rating.
   c. Shield: 100% Aluminum/polyester foil with drain wire.
   d. Jacket: PVC with UL Subject 1277 TC, UL 1581 and manufacturers' identification.
   e. Max overall diameter: 0.345-in.
   f. Miscellaneous: UL Listed as Instrument Tray Cable/Power Limited Tray Cable (PLTC) for use in accordance with Article 727 and Article 725 of the NEC.
   g. Manufacturers: Belden Cable; Manhattan; General Cable; The Okonite Co.; or equal

2. Three conductor (triad) cable:
   a. Conductors: 3 No. 16 stranded and twisted on 2-in lay.
   b. Insulation: XLPEwith 600 Volt, 105 degrees C rating.
   c. Shield: 100% Aluminum/polyester foil with drain wire.
   d. Jacket: PVC with UL Subject 1277 TC, UL 1581 and manufacturers' identification.
   e. Max overall diameter: 0.360-in.

f. Miscellaneous: UL Listed as Instrument Tray Cable/Power Limited Tray Cable (PLTC) for use in accordance with Article 727 and Article 725 of the NEC.
g. Manufacturers: Belden Cable; Manhattan; General Cable; The Okonite Co.; or equal.

3. Multiple pair cables (where shown on the Drawings):
   a. Conductor: Multiple 2 No. 22 stranded and twisted on a 2-in lay.
   b. Insulation: XLPE with 600 Volt, 105 degrees C rating.
   c. Shield: Individual pairs shielded with 100 percent mylar tape and drain wire.
   d. Jacket: PVC with UL Subject 13, UL 1581 manufacturers' identification.
   e. Misc: UL Subject 13, Type PLTC.
   f. Manufacturers:
      1) Belden.
      2) Manhattan.
      3) General Cable.

I. Splices for power wiring shall be compression type connectors insulated with a heat shrink boot or outer covering and epoxy filling. Splice kits shall be as manufactured by Raychem; Ideal Industries; 3M Co., or equal.

J. Motor connections shall be ring type mechanical compression terminations installed on the branch circuit wires and the motor leads and secured with bolt, nut and spring washer. Connections shall be insulated with a Raychem Type RVC, roll-on stub insulator, or equal.

K. Termination connectors for control wiring shall be of the locking fork-end (upturned leg ends) type as manufactured by Ideal Industries; 3M Co.; Panduit Corp. or equal.

L. Splices for control wiring shall be insulated compression type connectors of the expanded vinyl insulated parallel or pigtail type as manufactured by Ideal Industries; 3M Co.; Panduit Corp,. or equal.

M. Termination connectors for shielded instrumentation wiring shall be of the locking fork-end (upturned leg ends) type as manufactured by Ideal Industries; 3M Co.; Panduit Corp., or equal.

N. Wire markers shall be "Omni-Grip" as manufactured by the W.H. Brady Co.; Thomas & Betts Co.; 3M Co., or equal.

O. Wire and cables with diameters exceeding the capacity of the "Omni-Grip" shall be marked with pre-printed, self-adhesive vinyl tapes as manufactured by the W.H. Brady Co.; Panduit Corp., or equal.

P. Direct buried cable warning tape shall be 6-in wide, red polyethylene not less than 0.0035-in thick. Tape shall be W.H. Brady Co., Catalog No. 91296, or equal.

2.03 WIRING DEVICES

A. Wall switches shall be heavy duty, specification grade, toggle action, flush mounting quiet type. All switches shall conform to the latest revision of Federal Specification WS 896. Wall switches shall be of the following types and manufacturer:

1. Single pole, 20 Amp, 120/277 Volt - Arrow-Hart, Catalog No. 1991, or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc., or equal.

2. Double pole, 20 Amp, 120/277 Volt - Arrow-Hart, Catalog No. 1992, or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc., or equal.

3. Three way, 20 Amp, 120/277 Volt - Arrow-Hart, Catalog No. 1993, or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc., or equal.

4. Four way, 20 Amp, 120/277 Volt - Arrow-Hart, Catalog No. 1994, or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc., or equal.

5. Explosion-proof single pole factory sealed switches shall be for 20 Amps, 120/277 Volts, mounted in copper free aluminum or malleable iron cast boxes and be similar and equal to Crouse-Hinds EDS Series, or equal by Appleton Electric Co., or Killark.

B. Receptacles shall be heavy duty, specification grade of the following types and manufacturer or equal. Receptacles shall conform to Federal Specification WC596-F.

1. Duplex, 20 Amp, 125 Volt, 2P, 3W; Arrow-Hart, Catalog No. 5362, or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc.

2. Weatherproof/corrosion resistant single, 20 Amp, 125 Volt, 2P, 3W, with cover; Crouse-Hinds Co., Catalog No. WLRS-5-20, or equal by Appleton Electric.

3. Weatherproof/corrosion resistant duplex, 20 Amp, 125 Volt, 2P, 3W, with cover; Crouse-Hinds Co., Catalog No. WLRD-5-20, or equal by Appleton Electric.

4. Ground fault interrupter, duplex, 20 Amp, 125 Volt, 2P, 3W, GFCI feed thru type with "test" and "reset" buttons. Arrow-Hart, Catalog No. GF5342 or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc., or equal.

5. Single, "power lock," 20 Amp, 125 Volt, 2P, 3W; Arrow-Hart, Catalog No. 23030 and plug Arrow-Hart, Catalog No. 23035N or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc., or equal.

6. Single, 20 Amp, 250 Volts, 2P, 3W; Arrow-Hart, Catalog No. 5861 or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc. or equal.

7. Single twist-lock, 20 Amp, 250 Volts, 2P, 3W; Arrow-Hart, Catalog No. 6210; plug: Arrow-Hart, Catalog No. 6212 or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc. or equal.

8. Single twist-lock, 30 Amp, 250 Volts, 2P, 3W; Arrow-Hart, Catalog No. 6340; plug: Arrow-Hart, Catalog No. 6342 or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc. or equal.

9. Explosion-proof single, 20 Amp, 125 Amp, 2P, 3W; Appleton Electric, Catalog No. CPCI-2350 and plug, Appleton Electric, Catalog No. CPP-2033 or equal by Crouse-Hinds; Harvey Hubbell Inc.

10. Explosion-proof duplex, 20 Amp, 125 Volt, 2P, 3W; Appleton Electric, Catalog No. CPC2-2350 and plug, Appleton Electric, Catalog No. CPP-2023 or equal by Crouse-Hinds; Harvey Hubbell, Inc.

C. Device Plates:

1. Plates for indoor flush mounted devices shall be of the required number of gangs for the application involved and shall be as follows:
   a. Administration type buildings: Smooth, high impact nylon of the same manufacturer and color as the device. Final color to be as selected by the Architect.
   b. Where permitted in other areas of the plant, flush mounted devices in cement block construction shall be Type 302 high nickel (18-8) stainless steel of the same manufacturer as the devices.

2. Plates for indoor surface mounted device boxes shall be cast metal of the same material as the box, Crouse-Hinds, No. DS23G and DS32G, or equal.

3. Oversized plates shall be installed where standard plates do not fully cover the wall opening.

4. Device plates for switches mounted outdoors or indicated as weatherproof shall be gasketed, cast aluminum with provisions for padlocking switches "On" and "Off," Crouse Hinds, No. DS185, or equal.

5. Multiple surface mounted devices shall be ganged in a single, common box and provided with an adapter, if necessary, to allow mounting of single gang device plates on multi-gang cast boxes.

6. Engraved device plates shall be provided where required.

7. Weatherproof, gasketed cover for GFI receptacle mounted in a FS/FD box shall be Arrow-Hart, Catalog No. 4501-FS or equal by Harvey Hubbell, Inc.; Pass & Seymour, Inc., or equal.

D. Three Phase Power Receptacles:

1. Three phase power receptacles and plugs shall be rated for the voltage and current ratings of the connected load or as specified.

2. Receptacles and plug housings shall be constructed of stainless steel listed to UL 498 for watertight construction. Hardware shall be stainless steel.

3. Performance:
   a. Maximum working voltage: 600 Volts RMS.
   b. Dielectric withstand voltage: 3000 Volts.
   c. Full load break capability at rated current.
   d. 5000 connect/disconnect cycles at rated voltage and current.

4. Furnish and install one mating plug with each receptacle.

5. Provide the following features:
   a. Color coded by voltage.
   b. One piece housing/angled back box.
   c. Shrouded pins.
   d. Self-closing gasketed cover.

e. Watertight cable entrances/stress relief grips.
f. Mating keys.

6. Acceptable manufacturers:
   a. Hubbell (North American Rated Series II).
   b. General Electric.
   c. Arrow-Hart.

E. Interlocked Three Phase Power Receptacles:

1. Interlocked three phase power receptacles shall include a combination receptacle and a mechanically interlocked disconnect switch. The two units shall be interlocked to prevent removal or insertion of the plug, unless the switch is in the OFF position.

2. Provide a matching plug for every unit furnished.

3. Switch, power receptacle and mating plug shall be constructed of stainless steel.

4. Assemble shall be listed to UL 498 for watertight-construction.

5. Hardware shall be stainless steel.

6. Performance:
   a. Maximum working voltage: 600 Volts RMS.
   b. Dielectric withstand voltage: 3000 Volts.
   c. Full load break capability at rated current.
   d. 5000 connect/disconnect cycles at rated voltage and current.

7. Provide the following features:
   a. Color coded by voltage.
   b. One piece housing/angled back box.
   c. Shrouded pins.
   d. Self-closing gasketed cover.
   e. Watertight cable entrances/stress relief grips.
   f. Mating keys.

8. The disconnect switch shall be [unfused] [fused] with ratings as hereinbefore specified. Provide lockout provisions on the disconnect switch handle.

9. Acceptable manufacturers:
   a. Crouse-Hinds.
   b. Appleton.
   c. Killark.
   d. Hubbell.

2.04 MISCELLANEOUS EQUIPMENT

A. Disconnect Switches:

1. Disconnect switches shall be heavy-duty, quick-make, quick-break, visible blades, 600 Volt, 3 Pole with full cover interlock, interlock defeat and flange mounted operating handle.

2. NEMA 4 enclosures shall be [stainless steel] [painted steel] [cast aluminum].

3. NEMA 4X enclosures shall be [stainless steel] [fiberglass reinforced polyester].

4. Switches shall be as manufactured by the Square D Co.; Cutler Hammer Co.; General Electric Company; Siemens Company, or equal.

B. Manual Motor Starters:

1. Manual starters shall be suitable for the voltage and number of phase shown on the Drawings and shall be non-reversing, reversing or two speed type as shown on the Drawings. NEMA sizes shall be as required for the horse-powers shown on the Drawings. Manual starters shall have motor overload protection in each phase.

2. NEMA 4 enclosures shall be stainless steel.

3. NEMA 4X enclosures shall be stainless steel.

4. Manual motor starters shall be as manufactured by the Square D Co; Cutler Hammer Co.; General Electric Company; Siemens Company, or equal.

C. Combination Magnetic Motor Starters:

1. Motor starters shall be a combination motor circuit protector and contactor, 2 or 3 Pole, single or 3 phase as required, 60 Hz, 600 Volt, magnetically operated, full voltage non-reversing unless otherwise shown on the Drawings. NEMA sizes shall be as required for the horse-powers shown on the Drawings. Motor circuit protectors shall be molded case with adjustable magnetic trip only. They shall be specifically designed for use with magnetic motor starters. Motor circuit protectors shall be current limiting type, with additional current limiters if required. Combination motor starters shall be fully rated for 22,000 amps RMS symmetrical.

2. Each motor starter shall have a 120 Volt operating coil and control power transformer. Three phase starters shall have three overload relays. One normally open and one normally closed auxiliary contact shall be provided as spares in addition to contacts shown on the Drawings.

3. Overload relays shall be adjustable, ambient compensated and manually reset.

4. Furnish built-in control stations and indicating lights where shown on the Drawings.

5. NEMA 4 enclosures shall be stainless steel.

6. NEMA 4X enclosures shall be stainless steel.

7. Combination magnetic motor starters shall be as manufactured by the Square D Co.; Cutler Hammer Co.; General Electric Company; Siemens Company, or equal.

D. Circuit Breakers:

1. Provide thermal magnetic circuit breaker in NEMA Type 12 Enclosure with externally operated handle. Circuit breakers shall be fully rated for 22,000 Amps RMS symmetrical.

2. Circuit breakers shall be manufactured by Cutler Hammer Co.; General Electric Company; Siemens Company, or equal.

E. Control Stations:

1. Control stations shall be heavy-duty type, with full size operators. Momentary contact stop buttons shall have a lockout latch that can be padlocked in the open position.

2. NEMA 4 enclosures shall be stainless steel.

3. NEMA 4X enclosures shall be stainless steel.

4. Control stations shall be Square D Class 9001; Cutler Hammer Co.; General Electric Company; Allen Bradley Company, or equal.

F. Polyethylene Warning Tape:

1. Warning tape shall be red polyethylene film, 6-in minimum width.

2. Warning tape shall be W.H. Brady Co., Catalog No. 91296, or equal.

G. Heat Tracing:

1. DESIGN REQUIREMENTS
   a. Provide an electrical heat trace system capable of maintaining the specified temperature during the extreme of ambient temperature.
   b. Design Parameters

1)	Voltage Available	208 Volts 1 Phase
2)	Maximum Circuit Breaker Size	20 Amps
3)	Wind/Air Velocity	21 mph
4)	Min Ambient Temperature	16.5 degrees F
5)	Maintain Temperature	40 degrees F
6)	Start Up Temperature	40 degrees F

   7) Piping equipment lists, insulation types and thickness are specified in Division 15 and as shown on the Drawings.
   c. Heat losses shall be calculated using the manufacturer's standard procedure in conjunction with the insulation requirements and equipment schedules. The design heat output of the electrical heat trace system shall include a 10 percent factor of safety. Contractor is encouraged to suggest changes in insulation thickness to optimize total system economy.

2. APPLICATIONS
   a. The term "Freeze Protection" shall mean that the intent of the electrical heat trace system installed on equipment such as pipes, valves, pumps, gauges, tanks and controls is to prevent the process fluids from freezing when the ambient or

surrounding temperature falls below the fluids freezing point if other than 32 degrees F (0 degrees C).

3. Heat trace tape shall be temperature self-limiting type rated 5 watts per foot at 50 degrees F, 120 Volt, 60 Hz and shall be Chromalox, Catalog No. SRL5-1C with tinned copper overbraid and fluoropolymer outer jacket, or equal.

4. Thermocouple or RTD sensing element shall be stainless steel, and shall be Chromalox, Catalog No. RBF, or equal.

5. Circuit Controller and Monitor
   a. Heat trace circuit monitoring panels shall be capable of energizing the heat trace circuit from an ambient sensing thermostat, providing ground fault protection, alarm output contact for remote indication of ground fault trip and local indicating light for ground fault trip.
   b. Ground fault protection shall be capable of monitoring ground fault currents at a minimum of 30 mA and in compliance with the latest NEC and IEEE equipment protection requirements.
   c. Heat trace circuit controller and monitor shall be Chromalox ITC series or equal.

6. INSTALLATION
   a. Heat tracing system shall be installed where shown on the Drawings and in accordance with manufacturer's approved shop drawings and recommendations.
   b. Heating cables shall be run parallel to and on the bottom of the pipe at 5 o'clock or 7 o'clock only. Spiral wrapping of the heat cables around the pipes shall not be permitted.
   c. Power cables for heat tracing circuits running from the supply panel to circuit junction boxes located on each pipe shall be run in conduit. The heat tracing cable shall connect to the power cable in a junction box and be routed onto the pipe through a cable feeder connector with gland nut. The connector shall be two-piece construction with a tapered neoprene bushing and recessed flame-resistant interior gland. The connector shall be attached to the pipe with stainless steel junction box support and pipe strap.
   d. At each point where the junction box is attached to the lagging for heating cable entry to the pipe or device being protected and after the heating cable has been installed, the junction box stand-off shall be filled with clear Dow Corning TRV-732 compound or equal rated 500 degrees F, to provide a waterproof connection. The sealant compound shall also be forced into the voids in the insulation which were created during installation of the conduit hub. The sealant compound shall be placed to position all cables away from standoff sides and to separate cables away from one another. The sealant compound shall be applied in a clean, neat manner and in strict accordance with the manufacturer's instructions for the sealant. When the installation is complete, check that none of the compound has been left on other than the prescribed areas.
   e. Install "electrically traced line" warning signs every 25-ft along the outer pipe insulation jacket.

7. TESTING
   a. All testing shall be the responsibility of the equipment manufacturer.
   b. Measure the resistance of heating cable system before and after pipe insulation.
   c. Adjust and seal control thermostats to Owner's and Engineer's satisfaction after installation is complete.

H. Equipment Mounting Stands:

1. Equipment mounting stands shall be custom fabricated from 1/4-inch steel plate and 4-inch steel channel, as shown on the Drawings.

2.05 PANELBOARDS

A. Circuit Breakers:

1. Panelboards shall be equipped with circuit breakers.

2. Circuit breakers shall be molded case, bolt-in type.

3. Each circuit breaker used in 120/240 Volt and 120/208 Volt panelboards shall have an interrupting capacity of not less than 10,000 amperes, RMS symmetrical.

4. Each circuit breaker used in 277/480 Volt and 480 Volt panelboards shall have an interrupting capacity of not less than 22,000 amperes RMS symmetrical.

5. GFCI (ground fault circuit interrupter) shall be provided for circuits where shown on the Drawings. GFCI units shall be 1 Pole, 120 Volt molded case, bolt-on breakers, incorporating a solid state ground fault interrupter circuit insulated and isolated from the breaker mechanism. The unit shall be UL listed Class A Group I device (5 milliamp sensitivity, 25 millisecond trip time) and an interrupting capacity of 10,000 Amps RMS.

6. Circuit breakers shall be as manufactured by the panelboard manufacturer.

2.06 GROUNDING

A. Grounding conduit hubs shall be malleable iron type similar to Thomas & Betts Co.; Cat No. 3940 (3/4-in conduit size) by Burndy; O.Z./Gedney Co., or equal, and of the correct size for the conduit.

B. Waterpipe ground clamps shall be cast bronze saddle type, similar to Thomas & Betts Co. Cat. No. 2 (1/2-in, 3/4-in, or 1-in size) or equal by Burndy; O.Z./Gedney Co. or equal, and of the correct size for the pipe.

C. Buried grounding connections shall be by Cadweld process, or equal exothermic welding system.

1. Molds, cartridge materials and accessories shall be provided in kit form and selected per the manufacturer's written instructions for specific types, sizes and combinations of conductors and connected items. Molds and powder shall be furnished by the same manufacturer.

D. Bare copper ground wire shall be stranded, annealed copper wire conforming to ASTM B 3.

PART 3 EXECUTION

3.01 SLEEVES AND FORMS FOR OPENINGS

A. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc. Locate all necessary slots for electrical work and form before concrete is poured.

B. Exact locations are required for stubbing-up and terminating concealed conduit. Obtain shop drawings and templates from equipment vendors or other subcontractors and locate the concealed conduit before the floor slab is poured.

C. Where setting drawings are not available in time to avoid delay in scheduled floor slab pours, the Engineer may allow the installations of such conduit to be exposed. Requests for this deviation shall be submitted in writing. No additional compensation for such change will be allowed.

D. Seal all openings, sleeves, penetrations, and slots.

3.02 CUTTING AND PATCHING

A. Cutting and patching shall be done in a thoroughly workmanlike manner. Saw cut concrete and masonry prior to breaking out sections.

B. Core drill holes in concrete floors and walls as required.

C. Install work at such time as to require the minimum amount of cutting and patching.

D. Do not cut joists, beams, girders, columns or any other structural members.

E. Cut opening only large enough to allow easy installation of the conduit.

F. Patching to be of the same kind and quality of material as was removed.

G. The completed patching work shall restore the surface to its original appearance or better.

H. Patching of waterproofed surfaces shall render the area of the patching completely waterproofed.

I. Remove rubble and excess patching materials from the premises.

J. When existing conduits are cut at the floor line of wall line, they shall be filled with grout of suitable patching material.

3.03 INSTALLATION

A. Any work not installed per the Specifications shall be subject to change as directed by the Engineer. No extra compensation will be allowed for making these changes.

B. Electrical equipment shall be protected at all times against mechanical injury or damage by water. Electrical equipment shall not be stored outdoors. Electrical equipment shall be stored in dry permanent shelters. Do not install electrical equipment in its permanent location until structures are weather-tight. If any apparatus has been subject to possible injury by water, it

shall be thoroughly dried out and tested as directed by the Engineer, or shall be replaced at no additional cost at the Engineer's discretion.

C. Equipment that has been damaged shall be replaced or repaired by the equipment manufacturer, at the Engineer's discretion.

D. Repaint any damage to factory applied paint finish using touch-up paint furnished by the equipment manufacturer. The entire damaged panel or Section shall be repainted at no additional cost to the Owner.

E. Coordinate the conduit installation with other trades and the actual supplied equipment.

F. Install each 3-phase circuit in separate conduit.

G. Unless otherwise approved by the Engineer, conduit installed interior to the building shall be installed exposed; conduit installed exterior to the building shall be concealed.

H. Verify the exact locations and mounting heights of switches and receptacles prior to installation.

I. Exact locations of electrical equipment shall be determined by the Contractor and approved by the Engineer during construction. Obtain information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

3.04 CONDUIT, BOXES, AND FITTINGS

A. Except where otherwise specified, all wiring within structures shall be in rigid steel conduit.

B. PVC conduit shall be used for direct buried applications and concrete encased underground duct banks, except rigid steel conduit shall be used as raceway for shielded process instrumentation wiring, shielded control wiring, and I/O wiring.

C. PVC coated rigid steel conduit shall be used in areas designated "CORROSIVE."

D. PVC coated rigid steel conduit shall be used as a transition section where underground conduit stubs up above ground. The PVC coated rigid steel conduit shall extend a minimum of 6-inches above ground to allow for proper threading of the conduit.

E. Aluminum conduit shall be used for exposed conduit runs outdoors or in areas designated as "WET".

F. All boxes shall be metal.

G. Exposed switch, receptacle and lighting outlet boxes and conduit fittings shall be cast or malleable iron, except that cast aluminum shall be used with aluminum conduit.

H. Terminal boxes, junction boxes and pull boxes shall have NEMA ratings suitable for the location in which they are installed.

I. Conduit wall seals shall be used where underground conduits penetrate walls.

J. Conduit sealing bushings shall be used to seal conduit ends exposed to the weather.

K. No conduit smaller than 3/4-in electrical trade size shall be used, nor shall any have more than the equivalent of three 90-degree bends in any one run. Pull boxes shall be provided as required or directed.

L. No wire shall be pulled until the conduit system is complete in all details.

M. The ends of all conduits shall be tightly plugged to exclude dust and moisture during construction.

N. Conduit supports, other than for underground raceways, shall be spaced at intervals of 8-ft or less.

O. Conduit hangers shall be attached to structural steel by means of beam or channel clamps. Where attached to concrete surfaces, concrete inserts of the spot type shall be provided.

P. All conduits shall be run at right angles to and parallel with the surrounding wall and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduits shall be run perfectly straight and true.

Q. Conduit terminating in pressed steel boxes shall have double locknuts and insulated bushings.

R. Conduit terminating in NEMA 3R, 4, 4X and 12 enclosures shall be terminated with Myers type conduit hubs.

S. Conduits containing equipment grounding conductors and terminating in sheet steel boxes shall have insulated throat grounding bushings.

T. Conduits shall be installed using threaded fittings.

U. Liquidtight flexible metal conduit shall be used for all motor terminations, the primary and secondary of transformers, generator terminations and other equipment where vibration is present.

V. Flexible couplings shall be used in hazardous locations for all motor terminations and other equipment where vibration is present.

W. Aluminum fittings and boxes shall be used with aluminum conduit. Aluminum conduit shall not be imbedded in concrete. Aluminum conduit shall be isolated from other metals with plastic sleeves or plastic-coated hangers. Strap wrenches shall be used for tightening aluminum conduit.

X. Where conduits pass through openings in walls or floor slabs, the remaining openings shall be sealed against the passage of flame and smoke.

Y. PVC conduit to non-metallic box connections shall be made with PVC socket to male thread terminal adapters with neoprene O-ring and PVC round edge bushings.

Z. Conduit ends exposed to the weather shall be sealed with conduit sealing bushings.

AA. PVC conduit shall be supported with non-metallic clamps, PVC coated steel racks and stainless steel hardware.

BB. PVC boxes, conduit fittings, etc. with integral hubs shall be solvent welded directly to the PVC conduit system.

CC. Non-metallic boxes with field drilled or punched holes shall be connected to the PVC conduit system with threaded and gasketed PVC Terminal Adapters.

DD. All conduit entering or leaving a motor control center, switchboard or other multiple compartment enclosure shall be stubbed up into the bottom horizontal wireway or other manufacturer designated area, directly below the vertical section in which the conductors are to be terminated.

EE. All conduit which may under any circumstance contain liquids such as water, condensation, liquid chemicals, etc., shall be arranged to drain away from the equipment served. If conduit drainage is not possible, conduit seals shall be used to plug the conduits.

FF. Where no type or size is indicated for junction boxes, pull boxes or terminal cabinets, they shall be sized in accordance with the requirements of N.E.C. Article 370.

GG. Miscellaneous steel for the support of fixtures, boxes, transformers, starters, contactors, panels and conduit shall be furnished and installed.

HH. Steel channels, flat iron and channel iron shall be furnished and installed for the support of all electrical equipment and devices, where required, including all anchors, inserts, bolts, nuts, washers, etc. for a rigid installation.

II. Conduits passing from heated to unheated spaces, exterior spaces, refrigerated spaces, cold air plenums, etc., shall be sealed with "Duxseal" as manufactured by Manville or seal fitting to prevent the accumulation of condensation.

JJ. Rigid galvanized steel conduits which have been field cut and threaded shall be painted with cold galvanizing compounds.

KK. Conduit expansion and deflection fittings shall be installed on all conduits crossing building expansion joint. Where conduits are installed outdoors provide expansion and deflection fittings on all conduits crossing expansion joints or at 200 foot intervals whichever is the least dimension.

3.05 WIRE, CABLE AND ACCESSORIES

A. Uniquely identify all wires, cables and each conductor of multi-conductor cables (except lighting and receptacle wiring) at each end with wire and cable markers.

B. Use lubrications to facilitate wire pulling. Lubricants shall be UL approved for use with the insulation specified.

C. All wire shall be color coded or coded using electrical tape in sizes where colored insulation is not available. Where tape is used as the identification system, it shall be applied in all junction boxes and other accessible intermediate locations, as well as at each termination.

D. The following coding shall be used:

System	Wire	Color
240/120 Volts 1-Phase, 3-Wire	Neutral Line 1 Line 2	White Black Red
208Y/120, Volts 3-Phase, 4-Wire	Neutral Phase A Phase B Phase C	White Black Red Blue
240/120 Volts 3-Phase, 4-Wire delta, center tap ground on phase coil A-C	Neutral Phase A Phase B (High) Phase C	White Black Orange Blue
480Y/277 Volts 3-Phase, 4-Wire	Neutral Phase A Phase B Phase C	White Brown Orange Yellow

E. Power conductors: Terminations shall be die type or set screw type pressure connectors as specified. Splices (where allowed) shall be die type compression connector and waterproof with heat shrink boot or epoxy filling. Aluminum conductors (where specified) shall employ terminations and splices specifically designed for aluminum conductors.

F. Control Conductors: Termination on saddle-type terminals shall be wired directly with a maximum of two conductors. Termination on screw type terminals shall be made with a maximum of two spade connectors. Splices (where allowed) shall be made with insulated compression type connectors.

G. Instrumentation Signal Conductors (including graphic panel, alarm, low and high level signals): terminations same as for control conductors. Splices allowed at instrumentation terminal boxes only.

H. Except where permitted by the Engineer no splices will be allowed in manholes, handholes or other below grade located boxes.

I. Splices shall not be made in push button control stations, control devices (i.e., pressure switches, flow switches, etc.), conduit bodies, etc.

J. Instrumentation cables shall be installed in rigid steel raceways as specified. All circuits shall be installed as twisted pairs or triads. In no case shall a circuit be made up using conductors from different pairs or triads. Triads shall be used wherever three wire circuits are required.

K. Terminal blocks shall be provided at all instrument cable junction and all circuits shall be identified at such junctions.

L. Shielded instrumentation wire, shall be run without splices between instruments, terminal boxes, or panels.

M. Shields shall be grounded as recommended by the instrument manufacturer and isolated at all other locations. Terminal blocks shall be provided for inter-connecting shield drain wires at all junction boxes. Where individual circuit shielding is required, each shield circuit shall be provided with its own block.

3.06 WIRING DEVICES

A. Switch and receptacles outlets shall be installed flush with the finished wall surfaces in areas with stud frame and gypsum board construction, in dry areas with cement block construction or when raceways are concealed.

B. Do not install flush mounted devices in areas designated DAMP, WET or WET/CORROSIVE. Provide surface mounted devices in these areas.

C. Provide weatherproof devices covers in areas designated WET or WET/CORROSIVE.

3.07 PANELBOARDS

A. Connect panelboard branch circuit loads so that the load is distributed as equally as possible between the phase busses.

B. Type circuit directories giving location and nature of load served. Install circuit directories in each panelboard.

3.08 GROUNDING

A. Run grounding electrode conductors in rigid steel conduits. Bond the protecting conduits to the grounding electrode conductors at both ends. Do not allow water pipe connections to be painted. If the connections are painted, disassemble them and re-make them with new fittings.

B. Install equipment grounding conductors with all feeders and branch circuits.

C. Bond all steel building columns in new structures together with ground wire in rigid conduit and connect to the distribution equipment ground bus.

D. Ground wire connections to structural steel columns shall be made with long barrel type one-hole heavy duty copper compression lugs, bolted through 1/2-in maximum diameter holes drilled in the column web, with stainless steel hex head cap screws and nuts.

E. Metal conduits stubbed into a motor control center shall be terminated with insulated grounding bushings and connect to the motor control center ground bus. Bond boxes mounted below motor control centers to the motor control center ground bus. Size the grounding wire in accordance with NEC Table 250-95, except that a minimum No. 12 AWG shall be used.

F. Liquid tight flexible metal conduit in sizes 1-1/2-in and larger shall have bonding jumpers. Bonding jumpers shall be external, run parallel (not spiraled) and fastened with plastic tie wraps.

G. Seal exposed connections between different metals with No-Oxide Paint Grade A or equal.

H. Lay all underground grounding conductors slack and, where exposed to mechanical injury, protect by pipes or other substantial guards. If guards are iron pipe, or other magnetic material, electrically connect conductors to both ends of the guard. Make connections as specified herein.

I. Care shall be taken to ensure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.

J. All grounding type receptacles shall be grounded to the outlet boxes with a No. 12 THW green conductor connected to the ground terminal of the receptacle and fastened to the outlet box by means of a grounding screw.

K. Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with ground clamp connectors.

L. Bond interior mental piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters and HVAC equipment. Use braided-type bonding straps.

M. Test the grounding system. Use Biddle Direct Reading Earth Resistance Tester or equivalent test instrument to measure resistance to ground of the system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method.

N. Resistance to ground testing shall be performed during dry season. Submit test results in the form of a graph showing the number of points measured (12 minimum) and the numerical resistance to ground.

O. Testing shall be performed before energizing the distribution system.

P. A separate test shall be conducted for each building or system.

Q. Test all grounded cases and metal parts associated with the electrical equipment for continuity with the ground system.

R. Notify the Engineer immediately if the resistance to ground for any building or system is greater than five ohms.

END OF SECTION

Construction Plans

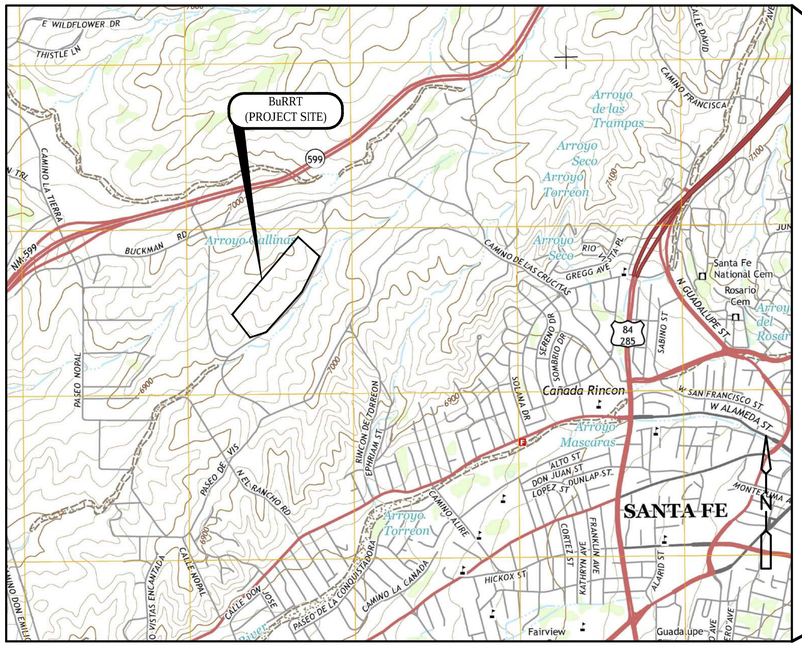
This Page Intentionally Left Blank

SANTA FE SOLID WASTE MANAGEMENT AGENCY

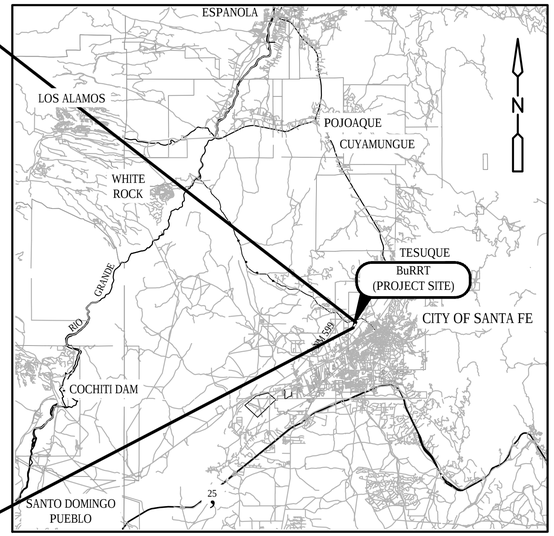
BUCKMAN ROAD RECYCLING & TRANSFER STATION

WATER LINE AND MISTING SYSTEM IMPROVEMENTS

BID NO. '17/42/B
MAY 2017



VICINITY MAP
NO SCALE



VICINITY MAP
NO SCALE

FACILITY ADDRESS:
2600 BUCKMAN ROAD
SANTA FE, NM 87507

SFSWMA

EXECUTIVE DIRECTOR
RANDALL KIPPENBROCK, P.E.

BuRRT SITE MANAGER
RANDY WATKINS

JOINT POWERS BOARD MEMBERS
COUNCILOR MIKE HARRIS – CHAIR
COMMISSIONER ANNA HAMILTON – VICE CHAIR
COMMISSIONER ANNA HANSEN
COMMISSIONER ED MORENO
COUNCILOR JOSEPH M. MAESTAS
COUNCILOR RENE VILLAREAL

GREGORY STEVE LARSON
NEW MEXICO
20820
5/10/17
PROFESSIONAL ENGINEER

CDM Smith

ALBUQUERQUE, NEW MEXICO

Water *Environment* *Transportation* *Energy* *Facilities*

SFSWMA

FINAL - ISSUED FOR CONSTRUCTION

116059-214241

GENERAL NOTES:

1. GENERAL NOTES AND ABBREVIATIONS APPLY TO ALL SHEETS, EXCEPT WHERE MORE SPECIFIC REQUIREMENTS ARE PROVIDED. SEE INDIVIDUAL DRAWINGS FOR ADDITIONAL ABBREVIATIONS, SYMBOLS, LEGENDS, NOTES, DETAILS AND OTHER REQUIREMENTS. IN ALL CASES THE INFORMATION SHOWN ON INDIVIDUAL DRAWINGS SHALL GOVERN OVER ANY GENERAL INFORMATION. NOT ALL SPECIFIED ITEMS AND/OR STANDARD DETAILS SHOWN MAY BE APPLICABLE TO THIS PROJECT.

2. UNLESS NOTED OTHERWISE, ALL WORK SHOWN IN THESE DOCUMENTS IS NEW AND TO BE PERFORMED UNDER THIS CONTRACT. ON SHEETS WHERE IT IS INDICATED THAT EXISTING IS TO BE MODIFIED AND/OR ADDED TO, WORK UNDER THIS CONTRACT IS NORMALLY SHOWN IN HEAVY LINES.

3. WRITTEN DISTANCES AND ELEVATIONS SHALL GOVERN OVER SCALED DISTANCES AND ELEVATIONS. PIPE LENGTHS SHOWN IN PROFILE OR PLAN ARE APPROXIMATE AND MAY VARY UP TO 5 PERCENT OF INDICATED LENGTH.

4. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE CONSULTING ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE CONTRACTORS PERFORMANCE OF WORK ON THIS PROJECT.

5. FINAL LOCATIONS OF ALL FACILITIES SHALL BE RECORDED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.

6. CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL IMPROVEMENTS WHICH ARE DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED TO THE ENGINEER'S SATISFACTION AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.

7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL PERMITS NECESSARY FOR THIS PROJECT PRIOR TO COMMENCING CONSTRUCTION.

8. THE TERM "ACCEPTABLE TO ENGINEER" SHALL MEAN WRITTEN ACCEPTANCE BY ENGINEER AND IS TO BE RECEIVED BY THE CONTRACTOR BEFORE WORK IS STARTED.

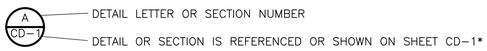
9. ANY DEVIATIONS FROM CONTRACT DOCUMENTS, INCLUDING DRAWINGS AND/OR SPECIFICATIONS, MUST BE ACCEPTED BY THE ENGINEER, IN WRITING, PRIOR TO THE WORK BEING DONE. ANY DEVIATIONS PERFORMED WITHOUT THE ENGINEER'S ACCEPTANCE WILL NOT BE PAID FOR, AND MAY BE REQUIRED TO BE REDONE AT THE CONTRACTOR'S EXPENSE.

10. EXCEPT AS MODIFIED BY THE CONTRACT DOCUMENTS, ALL WORK SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS (DRAWINGS, SPECIFICATIONS, ADDENDA, CHANGE ORDERS, APPROVED SUBMITTALS, ETC.) THE CONTRACTOR SHALL HAVE THE LATEST UPDATED VERSION OF THE ABOVE NAMED DOCUMENTS AT THE WORK SITE AT ALL TIMES.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE BY CONTRACTOR PERSONNEL WITH APPLICABLE CURRENT STATE REGULATIONS AND FEDERAL OSHA STANDARDS AND AS REQUIRED IN SECTION 107.8 OF THE NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPT. STANDARD SPECIFICATIONS, 2014 EDITION.

12. THE ENGINEER IS NOT RESPONSIBLE FOR THE CONSTRUCTION METHODS OR TECHNIQUES, OR FOR THE EXECUTION OF THE WORK AS SHOWN ON THESE PLANS. THE OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS, OR OTHER PERSONS PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THE CONTRACTORS OR SUBCONTRACTORS TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

13. ALL SHEETS USE THE FOLLOWING DETAIL AND SECTION CALLOUT CONVENTION UNLESS OTHERWISE NOTED:



* IF SECTION OR DETAIL IS DRAWN ON THE SAME SHEET WHERE IT IS CALLED OUT, THE SHEET NUMBER IS REPLACED WITH A HYPHEN.

14. DIMENSIONS AND LOCATION OF EXISTING PIPING, CONDUIT, EQUIPMENT IS APPROXIMATE. VERIFY EXISTING LAYOUT AND DIMENSIONS NECESSARY TO COMPLETE THE REQUIRED WORK.

DEMOLITION NOTES:

1. REFER TO SPECIFICATION 01010 SUMMARY OF WORK FOR SALVAGEABLE MATERIAL TO BECOME PROPERTY OF OWNER.

LIST OF DRAWINGS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GREGORY STEVE LARSON NEW MEXICO 20820 5/10/17 PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: G. LARSON
DRAWN BY: R. MESQUITA
SHEET CHK'D BY: G. LARSON
CROSS CHK'D BY: J. STEELE
APPROVED BY: G. LARSON
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

GENERAL NOTES AND LIST OF DRAWINGS

PROJECT NO. 116059–214241
FILE NAME: G001NFNT.DWG

SHEET NO.
G-1

GENERAL ABBREVIATIONS

A	@	AT
	AD	AREA DRAIN
	AFF	ABOVE FINISHED FLOOR
	AV	ACID VENT
	AW	ACID WASTE
B	BFP	BACKFLOW PREVENTER
	BLDG	BUILDING
	BOP	BOTTOM OF PIPE
	BWV	BACKWATER VALVE
C	CL	CENTERLINE
	CA	COMPRESSED AIR
	CI	CAST IRON
	CO	CLEANOUT
	CONT	CONTINUOUS, CONTINUE
	CS	CARBON STEEL
	CU	COPPER
	CU FT	CUBIC FEET
	CV	CHECK VALVE
	CW	COLD WATER (POTABLE)
D	D	DRAIN
	DCO	DOUBLE CLEANOUT
	DCW	DOMESTIC COLD WATER (POTABLE)
	DHW	DOMESTIC HOT WATER (POTABLE)
	DI	DUCTILE IRON, DEIONIZED WATER
	DIR	DEIONIZED WATER RETURN
	DN	DOWN
	DWG	DRAWING
E	E	EMERGENCY WATER
	ECO	EXTERIOR CLEANOUT
	EL	ELEVATION
	ES	EMERGENCY SHOWER
	ESEW	EMERGENCY SHOWER/EYEWASH STATION
	EWC	ELECTRIC WATER COOLER
	EWU	EYE WASH UNIT
F	FAS	FLOW ALARM SWITCH
	FCO	FLOOR CLEANOUT
	FD	FLOOR DRAIN
	FE	FIRE EXTINGUISHER
	FHV&C	FIRE HOSE VALVE AND CABINET
	FS	FLOW SWITCH
	FV	FIRE VALVE
	F/BS	FACE/BODY SPRAY
G	G	GAS
	GPM	GALLONS PER MINUTE
H	HB	HOSE BIBB
	HEV	HOSE END VALVE
	HW	HOT WATER
	HWR	HOT WATER RETURN
	HTHW	HIGH TEMPERATURE HOT WATER (140° F)
I	INV	INVERT
	IOS	INSTALLED BY OTHER SECTION
	IPS	IRON PIPE SIZE
K	KS	KITCHEN SINK
	KU	KITCHEN UNIT
L	LAB	LABORATORY
	LAV	LAVATORY
	LBV	LOCKABLE BALL VALVE
	LCW	LAB COLD WATER
	LHW	LAB HOT WATER
	LS	LAB SINK
	LSV	LOCK SHIELD VALVE
M	MAX	MAXIMUM
	MIN	MINIMUM
	MS	MOP SINK / BASIN
N	NG	NATURAL GAS
	NO	NUMBER
	NPW	NON-POTABLE WATER
O	OED	OPEN END OR OPEN EQUIPMENT DRAIN
	ORD	OVERFLOW ROOF DRAIN
	ORL	OVERFLOW RAIN LEADER
P	PD	PUMP DISCHARGE
	PG	PRESSURE GAUGE
	PH	POST HYDRANT
	PHW	PROTECTED HOT WATER
	PP	POLYPROPYLENE
	PTW	PROTECTED WATER
	PRW	PRESSURE WASTE
	PSI	POUNDS PER SQUARE INCH
	P&T	PRESSURE & TEMPERATURE
	PVC	POLYVINYL CHLORIDE
	PW	POTABLE WATER
R	RCP	RECIRCULATION PUMP
	RD	ROOF DRAIN
	RM	ROOM
	RPBP	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
	RWL	RAINWATER LEADER
S	S	SOIL
	SA	SHOCK ABSORBER
	SF	SQUARE FOOT
	SH	SHOWER
	SHT	SHEET
	SP	SPRINKLER
	SQ	SQUARE
	SS	SANITARY SEWER
	SSF	SANITARY SEWER (FORCE MAIN)
	SSG	SANITARY SEWER (GRAVITY)
	SK	SINK
	SSK	SERVICE SINK
T	T&P	TEMPERATURE & PRESSURE RELIEF
	TD	TRENCH OR TROUGH DRAIN
	TMV	THERMOSTATIC MIXING VALVE
	THK	THICK(NESS)
	TP	TRAP PRIMER
	TW	TEPID WATER
	TWR	TEPID WATER RETURN
	TWH	TANKLESS WATER HEATER
	TYP	TYPICAL
U	UNO	UNLESS NOTED OTHERWISE
	UR	URINAL
	UW	UTILITY WATER
V	V	VENT
	VAC	VACUUM
	VB	VACUUM BREAKER
	VE	VACUUM EXHAUST
	VTR	VENT THROUGH ROOF
W	W	WASTE
	W/	WITH
	WC	WATER CLOSET
	WCO	WALL CLEANOUT
	WF	WASH FOUNTAIN
	WH	WATER HEATER; WATER HYDRANT
	WHA	WATER HAMMER ARRESTOR
	WHS	WASH HOSE STATION
	WT	(SANITARY) WASTE
	W&T	WASTE & TRAP
	W&V	WASTE & VENT

EQUIPMENT SYMBOLS

CHECK VALVE

GATE VALVE

BALL VALVE

BALL VALVE

BALL VALVE

GLOBE VALVE

FLOW BALANCING AND SHUTOFF VALVE

BUTTERFLY VALVE

PLUG VALVE

SHOCK ABSORBER W/ ISOLATION VALVE

SOLENOID VALVE (S, NC)

UNION

TEMPERATURE & PRESSURE RELIEF VALVE

RAIN LEADER DISCHARGE SPOUT

FLOW ALARM SWITCH

EMERGENCY SHOWER/EYEWASH STATION

EQUIPMENT PROVIDED UNDER PLUMBING SECTION

CO — CLEANOUT

FLOOR CLEANOUT

WCO — WALL CLEANOUT

DCO — DOUBLE CLEANOUT

FLOOR DRAIN

HUB DRAIN

HOSE BIBB

HOSE REEL

WATER PROOF SLEEVE

PROTECTED WATER CONNECTION IDENTIFICATION NUMBER

NEW CONNECTION TO EXISTING

DN OR DROP

UP OR RISE

NOTE: THE TERMS "DN" "DROP" "UP" & "RISE" ARE USED TO INDICATE THE VERTICAL DIRECTION IN WHICH A PIPE LINE CONTINUES FROM THE IMAGINARY PLANE OF VIEW. THE TERMS HAVE NO RELEVANCE TO THE DIRECTION OF FLOW WITHIN THE PIPE LINE.

PIPING SYMBOLS

SOIL OR WASTE (PLAN VIEW)

SOIL OR WASTE (ISOMETRIC VIEW)

VENT

COLD WATER (POTABLE/PROTECTED)

HOT WATER (POTABLE), HTHW

TEPID WATER (POTABLE)

PROTECTED WATER

CAP

BOTTOM CONNECTION

TOP CONNECTION

ELBOW UP

ELBOW DOWN

P-TRAP

TEE

TEE UP

TEE DOWN

UNION-SCREWED

UNION-FLANGED

PLUMBING GENERAL NOTES:

1. THE NOTES BELOW APPLY UNLESS OTHERWISE INDICATED ON THE PLANS.
2. EQUIPMENT DIMENSIONS, LOCATIONS, AND PIPING SYSTEM LAYOUTS ARE BASED ON EQUIPMENT SELECTED BY THE ENGINEER. IF THE CONTRACTOR PROPOSES TO FURNISH EQUIPMENT THAT REQUIRES AN ARRANGEMENT OR SPACE DIFFERING FROM THAT INDICATED ON THE DRAWINGS OR SPECIFIED, THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR APPROVAL DETAILED ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, INSTRUMENTATION, HVAC, AND ELECTRICAL DRAWINGS AND EQUIPMENT LISTS SHOWING ALL NECESSARY CHANGES AND EMBODYING ALL FEATURES OF THE PROPOSED EQUIPMENT. THIS INFORMATION SHALL INCLUDE, BUT NOT BE LIMITED TO, PLANS, SECTIONS, DETAILS, AND SCHEMATICS OF ALL APPURTENANCES REQUIRED. SUCH CHANGES, IF APPROVED BY THE ENGINEER, SHALL BE AT NO EXTRA COST TO THE OWNER. THE CONTRACTOR SHALL ASSUME THE COST AND RESPONSIBILITY FOR SATISFACTORILY ACCOMPLISHING ALL THE NECESSARY CHANGES CORRESPONDING TO THE DIMENSIONS AND CHARACTERISTICS OF THE SUBMITTED EQUIPMENT.
3. COORDINATE THE WORK ON THE PLUMBING DRAWINGS WITH ALL TRADES. THE WORK SHOWN IS INTENDED TO PROVIDE THE OVERALL ENGINEERING DESIGN CONCEPT AND DOES NOT INDICATE ALL REQUIRED RELOCATIONS, OFFSETS, FITTINGS, AND APPURTENANCES. SOME REQUIRED COMPONENTS ARE NOT SHOWN FOR THE SAKE OF CLARITY. COORDINATION OF TRADES SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. EXISTING AS-BUILT DRAWINGS THAT INDICATE PRECISE PIPE ROUTINGS, DUCTS, ETC., ARE NOT COMPLETE OR NOT AVAILABLE. FIELD ADJUSTMENT OF CONNECTION POINTS AND RELOCATION OF EXISTING ITEMS MAY BE REQUIRED. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO STARTING THE WORK.

RECIRCULATION PUMP SCHEDULE

TAG	LOCATION	SYSTEM	CIRCULATING FLUID DATA			% EFF.	TYPE	ELECTRICAL			MANUFACTURER	MODEL	NOTES
			LIQUID	GPM	HEAD (FT)			WATTS	V/PH/HZ	RPM			
RCP-1	ADMIN. BUILDING	TEPID WATER	WATER	3	13	-	INLINE	92	115/1/60	2940	BELL & GOSSETT	NBF-22U	1

NOTES:
1. PROVIDE PUMP WITH THE FOLLOWING FEATURES: LEAD-FREE BRONZE BODY; NON-METALLIC IMPELLER; CERAMIC SHAFT; BEARINGS LUBRICATED BY THE PUMPED FLUID; AND MOTOR OVERLOAD PROTECTION.

THERMOSTATIC MIXING VALVE SCHEDULE

TAG	LOCATION	SYSTEM	HOT WATER		COLD WATER		MIXED WATER		MIN. FLOW (GPM)	MAX ΔP (PSI)	MANUFACTURER	MODEL	NOTES
			TEMP °F	GPM	TEMP °F	GPM	TEMP °F	GPM					
TMV-1	ADMIN. BLDG	TEPID WATER	140	10.4	40	12.6	85	23	3	10	GUARDIAN VALVE	G3800LF	1

NOTES:
1. PROVIDE VALVE WITH THE FOLLOWING FEATURES: ASSE 1017 CERTIFIED; DIAL THERMOMETER ON DISCHARGE PORT; INTEGRAL STRAINER AT EACH INLET; INTEGRAL CHECK VALVE AT EACH INLET; AND INTEGRAL STOP VALVE.

NOTE: THIS IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS SHOWN HERE APPEAR ON THE CONTRACT DRAWINGS.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/10/17
CHRISTOPHER ERIC MONROE NEW MEXICO 23963 PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

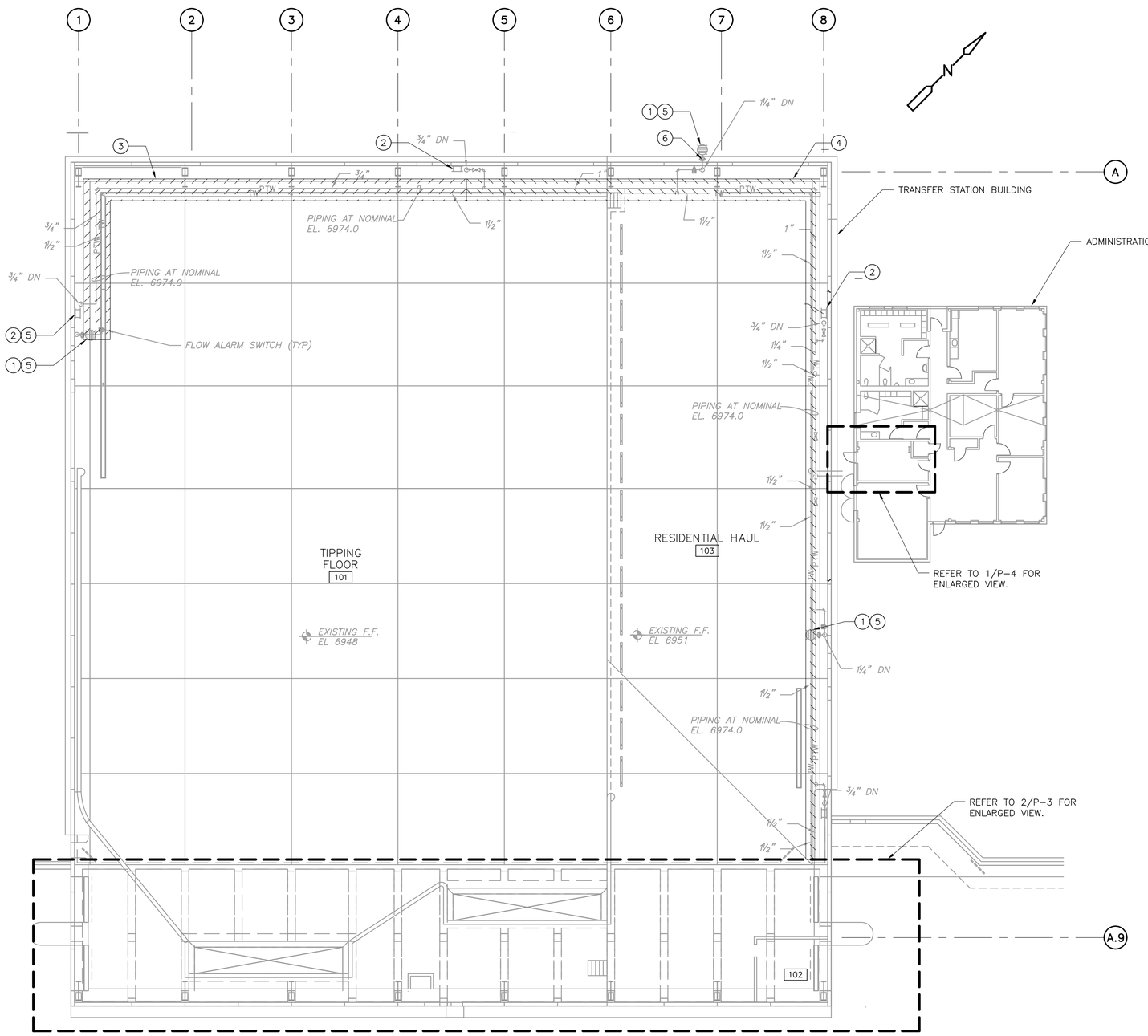
CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

PLUMBING LEGENDS, SYMBOLS, NOTES SCHEULES AND ABBREVIATIONS

PROJECT NO. 116059-214241
FILE NAME: P001SYMB.DWG
SHEET NO. P-1

ISSUED FOR CONSTRUCTION



PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. EXISTING ROOF DRAIN PIPING, SPRINKLER PIPING, AND PROPANE GAS PIPING IS NOT SHOWN FOR CLARITY.

KEY NOTES:

1. DEMOLISH THE ESEW AND ASSOCIATED FLOW ALARM SWITCH. DEMOLISH THE BRANCH TW FROM THE HORIZONTAL MAIN TO THE ESEW.
2. DEMOLISH THE WHS (HOSE AND HOSE RACK). DEMOLISH THE BRANCH PTW FROM THE HORIZONTAL MAIN TO THE WHS.
3. DEMOLISH THE MAIN HORIZONTAL TW AND PTW PIPING IN THIS HATCHED AREA. DEMOLISH THE TRAPEZE HANGERS IN THIS HATCHED AREA.
4. DEMOLISH THE MAIN HORIZONTAL TW AND PTW PIPING IN THIS HATCHED AREA. DO NOT DEMOLISH THE TRAPEZE HANGERS IN THIS HATCHED AREA. THE HANGERS WILL BE REUSED.
5. DEMOLISH THE WALL-MOUNTED CLAMPS FOR THE VERTICAL PIPING.
6. SEAL THE EXTERIOR WALL PENETRATION.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/10/17
CHRISTOPHER ERIC MONROE
NEW MEXICO
23963
PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

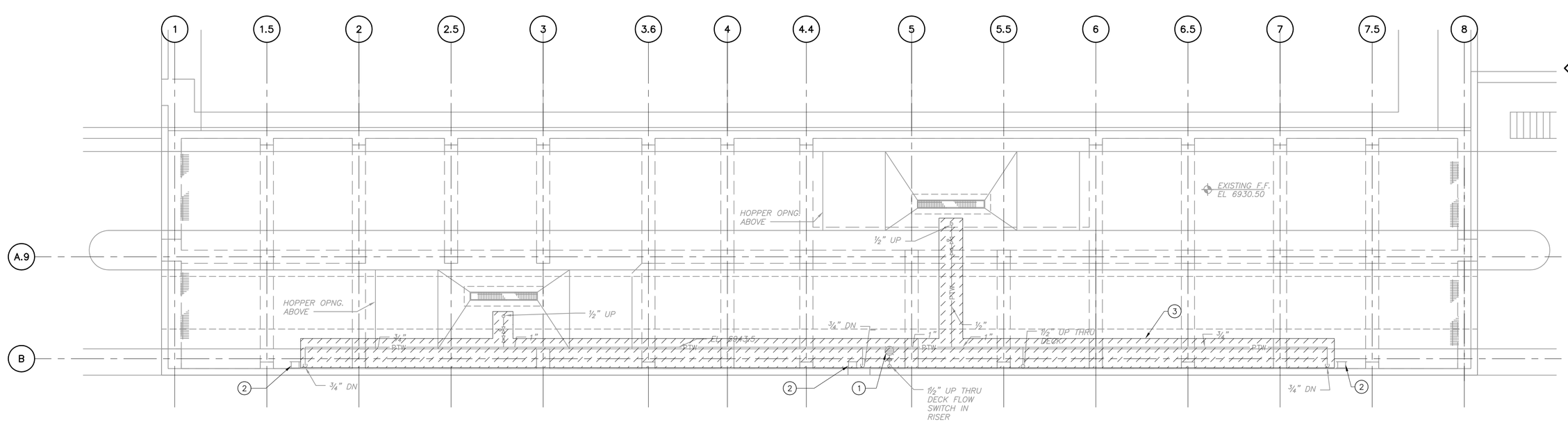
CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

TIPPING BUILDING DEMOLITION PLUMBING PLAN

PROJECT NO. 116059-214241
FILE NAME: P002TFDM.DWG
SHEET NO.
P-2

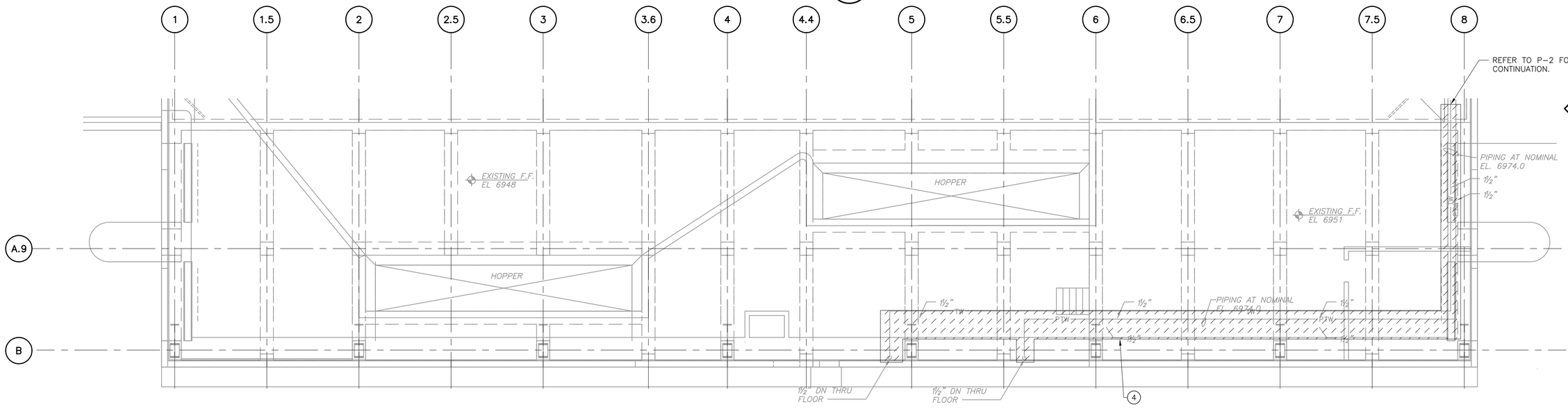
ISSUED FOR CONSTRUCTION



TUNNEL AREA

PLAN 1

1/4" = 1'-0"



HOPPER AREA

PLAN 2

1/4" = 1'-0"

GENERAL NOTES:

1. EXISTING ROOF DRAIN PIPING, SPRINKLER PIPING, AND PROPANE GAS PIPING IS NOT SHOWN FOR CLARITY.

KEY NOTES:

(1) DEMOLISH THE ESEW AND ASSOCIATED FLOW ALARM SWITCH. DEMOLISH THE VERTICAL BRANCH TW FROM THE CEILING PENETRATION MAIN TO THE ESEW. DEMOLISH THE WALL-MOUNTED CLAMPS FOR THE VERTICAL PIPING.

(2) DEMOLISH THE WHS (HOSE AND HOSE RACK). DEMOLISH THE BRANCH PTW FROM THE HORIZONTAL MAIN TO THE WHS.

KEY NOTES:

(3) DEMOLISH THE MAIN HORIZONTAL PTW PIPING IN THIS HATCHED AREA. DO NOT DEMOLISH THE TRAPEZE HANGERS IN THIS HATCHED AREA. THE HANGERS WILL BE REUSED.

(4) DEMOLISH THE MAIN HORIZONTAL TW AND PTW PIPING IN THIS HATCHED AREA. DO NOT DEMOLISH THE TRAPEZE HANGERS IN THIS HATCHED AREA. THE HANGERS WILL BE REUSED.

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/10/17

CHRISTOPHER ERIC MONROE NEW MEXICO 23963 PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

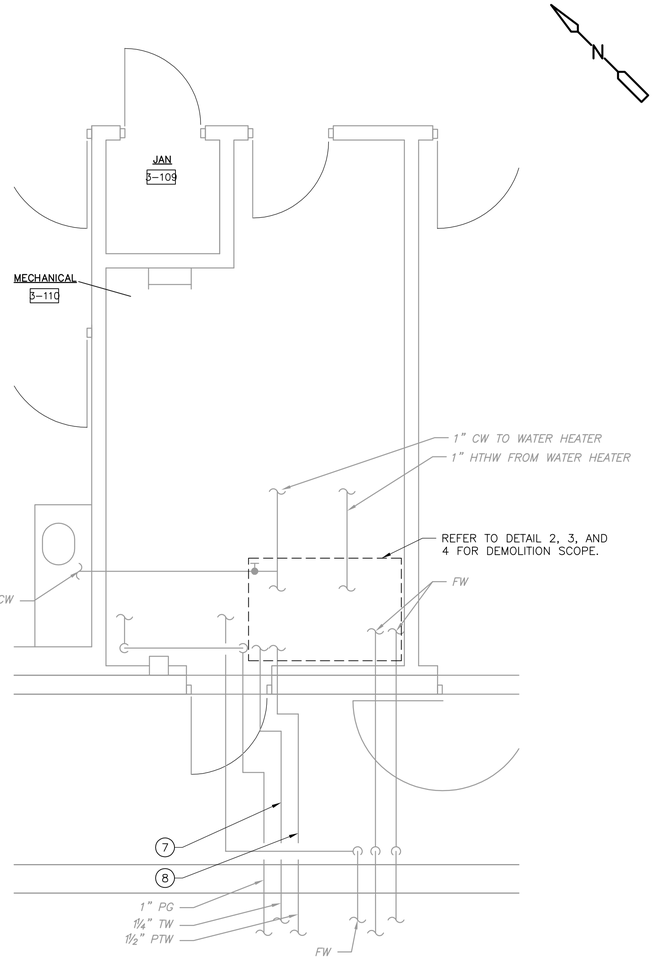
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

TIPPING BUILDING TUNNEL AND HOPPER AREA DEMOLITION PLUMBING PLAN

PROJECT NO. 116059-214241
FILE NAME: P003TFDM.DWG

SHEET NO.
P-3

ISSUED FOR CONSTRUCTION



PLUMBING

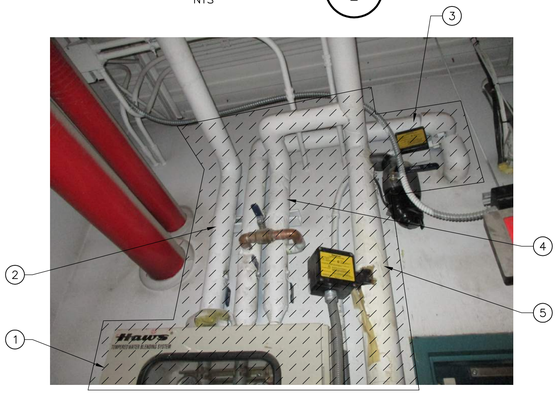
DETAIL 1 / –

3/8" = 1'-0"

TEPID WATER PANEL DEMOLITION

DETAIL 2 / –

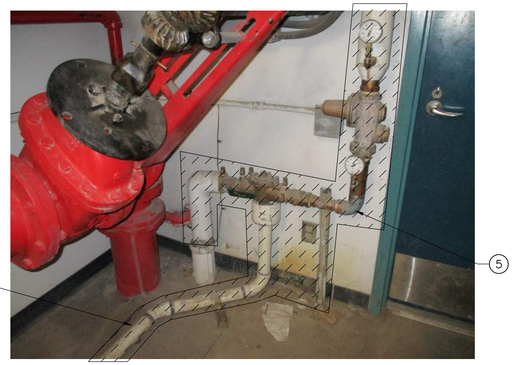
NTS



TEPID WATER PANEL UPPER PIPING

DETAIL 3 / –

NTS



BACKFLOW PREVENTER DEMOLITION

DETAIL 4 / –

NTS

KEY NOTES:

1. DEMOLISH THE TEPID WATER PANEL.
2. DEMOLISH THE BRANCH HTHW PIPING TO THE TEPID WATER PANEL.
3. DEMOLISH THE BRANCH TW PIPING FROM THE TEPID WATER PANEL.
4. DEMOLISH THE BRANCH CW PIPING TO THE TEPID WATER PANEL.
5. DEMOLISH THE CW PIPING.
6. DEMOLISH THE DRAIN PIPING.
7. DEMOLISH THE TW PIPING BETWEEN THE BUILDINGS.
8. DEMOLISH THE PTW PIPING BETWEEN THE BUILDINGS.

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/19/17

CHRISTOPHER ERIC MONROE NEW MEXICO 23963 PROFESSIONAL ENGINEER

Christopher Eric Monroe

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

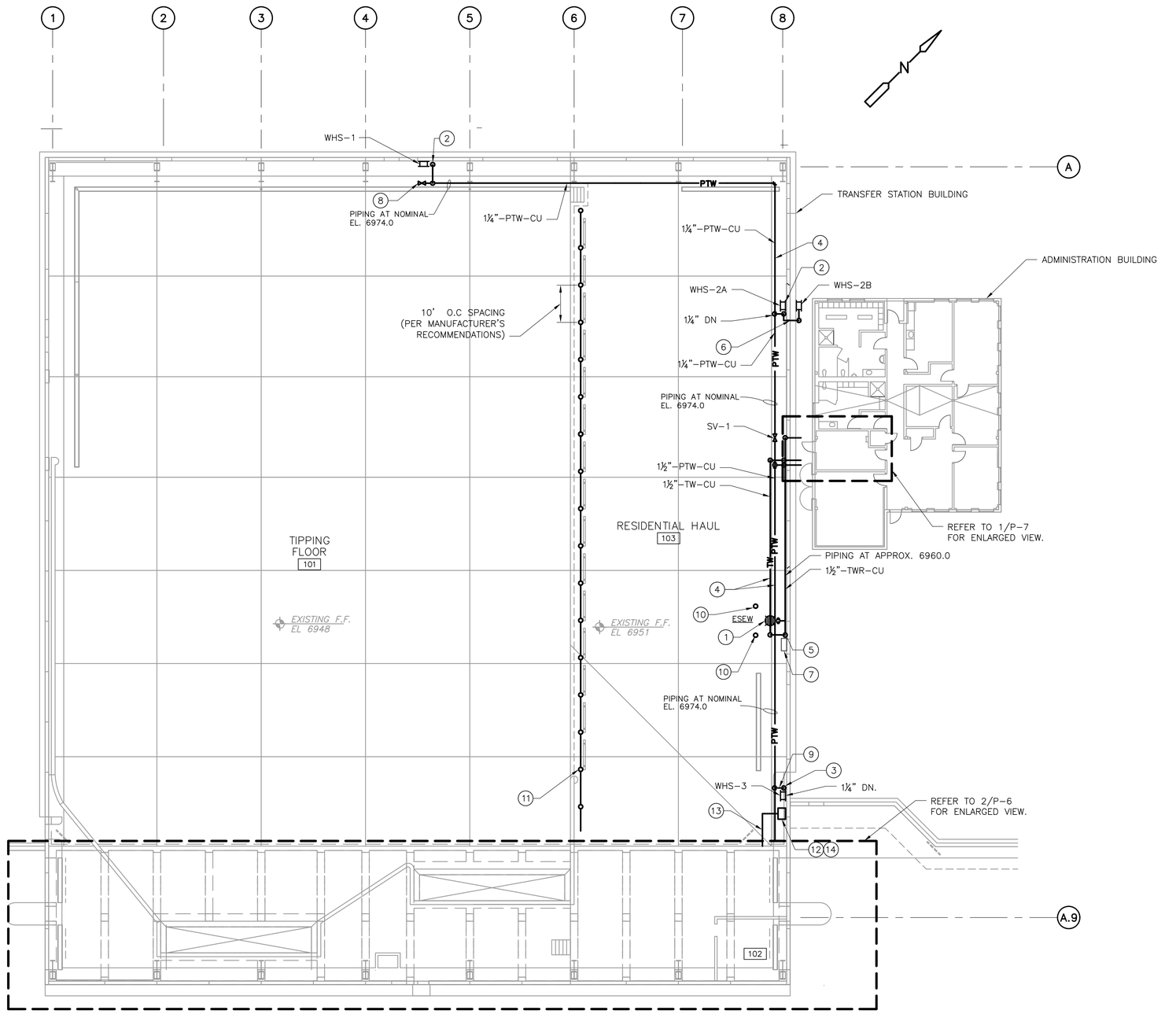
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ADMINISTRATION BUILDING
DEMOLITION
PLUMBING PLAN

PROJECT NO. 116059-214241
FILE NAME: P004ABDM.DWG

SHEET NO.
P-4

ISSUED FOR CONSTRUCTION



PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. INSULATE ALL TW AND TWR PIPING.
2. INSULATE THE HEAT TRACED PORTIONS OF THE PTW PIPING. REFER TO E-7.

KEY NOTES:

1. REF: A/PD-1 FOR ESEW DETAIL.
2. REF: B/PD-1 FOR WHS DETAIL.
3. REF: C/PD-1 FOR WHS AND SV-3 DETAIL. PROVIDE A METAL JACKET ON THE INSULATED BRANCH PIPING. THE JACKET SHALL EXTEND UP TO 15' AFF.
4. INSTALL TW AND PTW MAIN HORIZONTAL PIPING ON THE EXISTING TRAPEZE HANGERS.
5. TURN DOWN TO ESEW.
6. EXTEND 3/4"-PTW-CU THROUGH THE WALL AT APPROX. 6956.0 TO THE WHS. REF. H/PD-1 FOR PIPE PENETRATION DETAIL.
7. INSTALL THE RCP-1 TEMPERATURE CONTROLLER ON THE WALL IN A NEMA 3R ENCLOSURE. INSTALL THE CONTROLLER REMOTE BULB ON THE TW LINE THAT DROPS DOWN TO THE ESEW. REF: 1/PD-1 FOR THE THERMOWELL DETAIL.
8. TERMINATE PTW MAIN WITH A LINE SIZE VALVE AND THREADED CAP.
9. INSTALL SV-2 IN THE BRANCH HORIZONTAL PIPING.
10. REF: A/PD-3 FOR PIPE BOLLARD DETAIL.
11. OVERHEAD MISTING SYSTEM HIGH PRESSURE HOSE. MOUNT TO OVERHEAD RIGID FRAME ROOF BEAM ON COLUMN 6 PER C/PD-3. PIPE SHOWN OFFSET FROM COLUMN 6 FOR CLARITY PURPOSE ONLY.
12. OVERHEAD DUST SUPPRESSION SYSTEM BASE UNIT. REFER TO SECTION 11700 FOR DETAIL. PROVIDE WATER TO DUST SUPPRESSION SYSTEM FROM WHS-3 AUXILIARY 1-1/4" BALL VALVE CONNECTION.
13. ROUTE OVERHEAD DUST SUPPRESSION SYSTEM HIGH PRESSURE HOSE USING EXISTING TRAPEZE HANGERS.
14. REF: B/PD-3 FOR BASE DETAIL.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/10/17
CHRISTOPHER ERIC MONROE NEW MEXICO 23963 PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

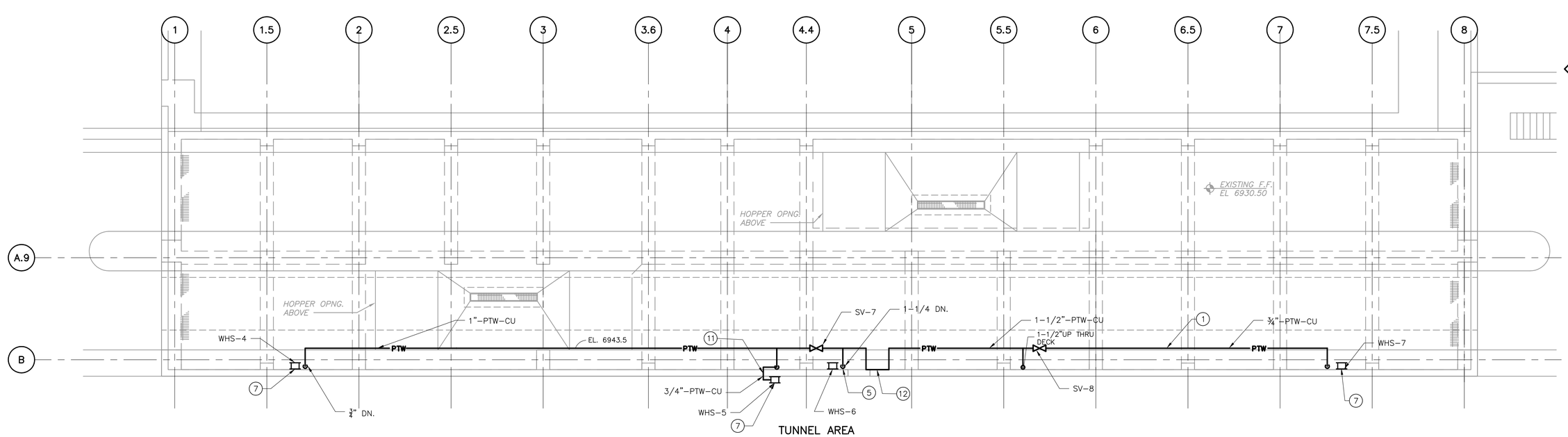
CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

TIPPING BUILDING
PLUMBING PLAN

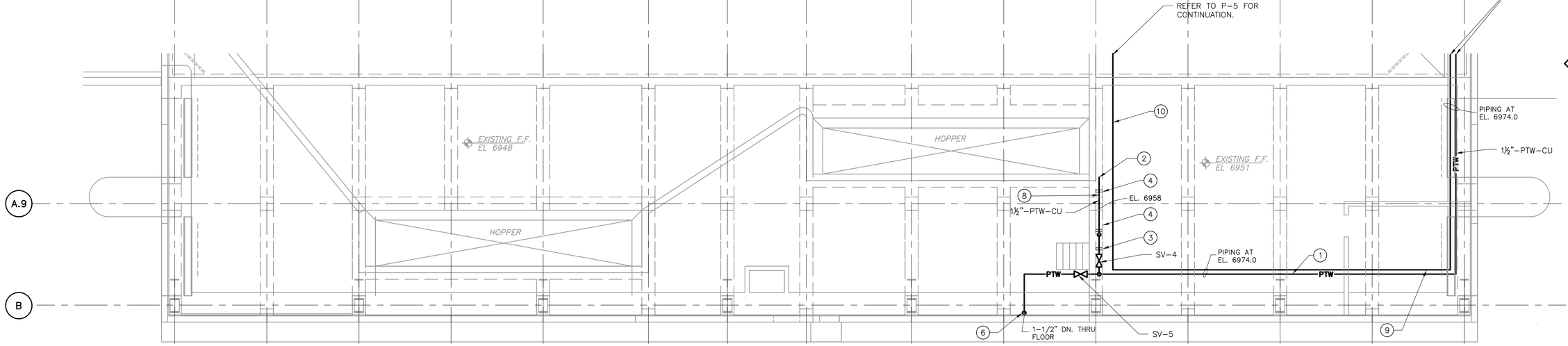
PROJECT NO. 116059-214241
FILE NAME: P005TFDM.DWG
SHEET NO.
P-5

ISSUED FOR CONSTRUCTION



TUNNEL AREA

PLAN 1 — 1/4" = 1'-0"



HOPPER AREA

PLAN 2 — 1/4" = 1'-0"

GENERAL NOTES:

1. INSULATE THE HEAT TRACED PORTIONS OF THE PTW PIPING. REFER TO E-8.

KEY NOTES:

1. INSTALL PTW MAIN PIPING ON THE EXISTING PIPE HANGERS.
2. REF: PD-2 FOR CONTINUATION OF 1-1/2"-PTW-CU AT HOPPER AREA.
3. RE: E/PD-1 FOR SUSPENDED HORIZONTAL PIPE HANGER DETAIL.

KEY NOTES:

4. PROVIDE BASE-MOUNTED CHANNEL FOR PIPE HORIZONTAL SUPPORT.
5. REF: C/PD-1 FOR WHS AND SV-6 DETAIL. PROVIDE A METAL JACKET ON THE INSULATED BRANCH PIPING. THE JACKET SHALL EXTEND UP TO 15' AFF.
6. UTILIZE THE EXISTING CORED OPENING FOR THE FLOOR PENETRATION.
7. REF: D/PD-1 FOR WHS DETAIL.
8. SLOPE PIPE TO DRAIN THROUGH HOPPER SPRAY SYSTEM NOZZLES.
9. OVERHEAD DUST SUPPRESSION SYSTEM HIGH PRESSURE HOSE.
10. MOUNT TO OVERHEAD BEAM.
11. REF: H/PD-1 FOR PIPE PENETRATION DETAIL.
12. FREEZESTAT FOR WHS-CP. REF: I/PD-1 FOR THERMOWELL DETAIL. INSTALL FREEZESTAT CONTROL PANEL IN A NEMA 3R ENCLOSURE. INSTALL THE ENCLOSURE HIGH ENOUGH SO THAT THE BULB CAPILLARY CAN REACH THE PTW HORIZONTAL PIPING. ADJUST THE FREEZESTAT SETPOINT TO 37° F.

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/10/17
CHRISTOPHER ERIC MONROE
NEW MEXICO
23963
PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

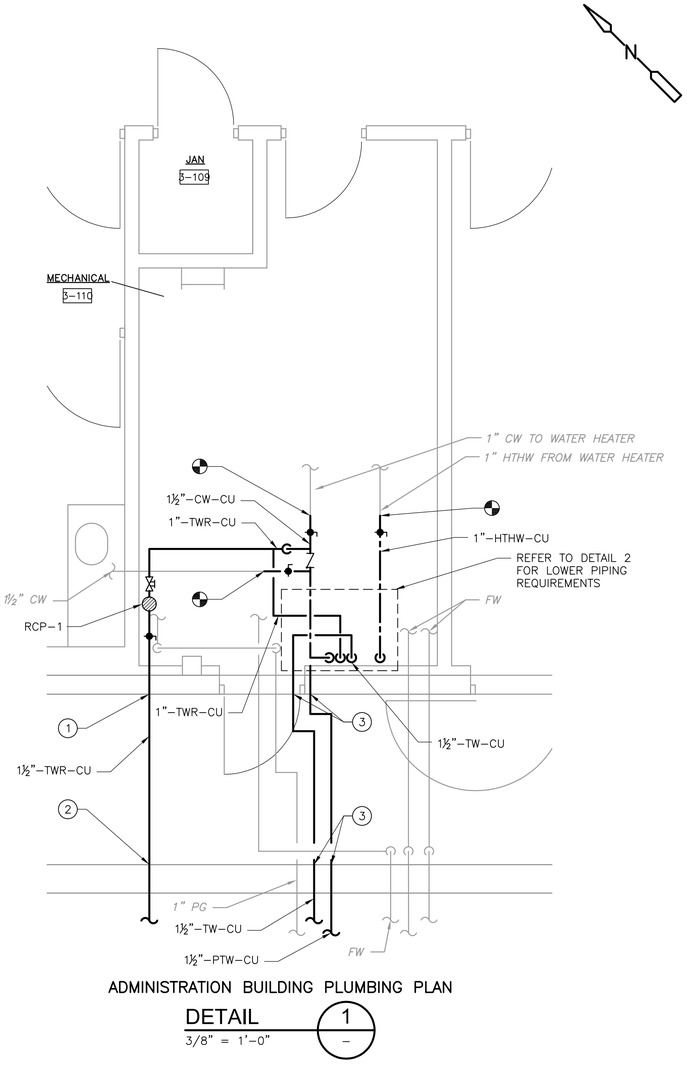
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

TIPPING BUILDING TUNNEL AND HOPPER AREA PLUMBING PLAN

PROJECT NO. 116059-214241
FILE NAME: P006TFDM.DWG

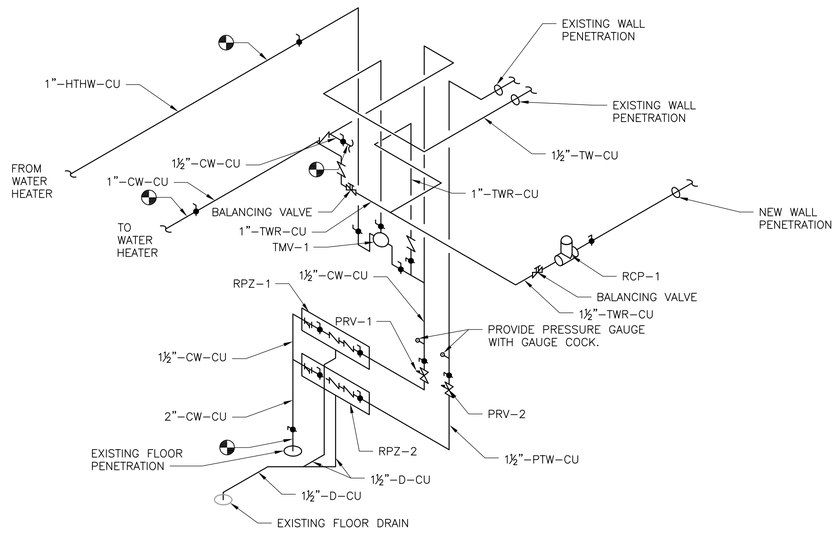
SHEET NO.
P-6

ISSUED FOR CONSTRUCTION



ADMINISTRATION BUILDING PLUMBING PLAN

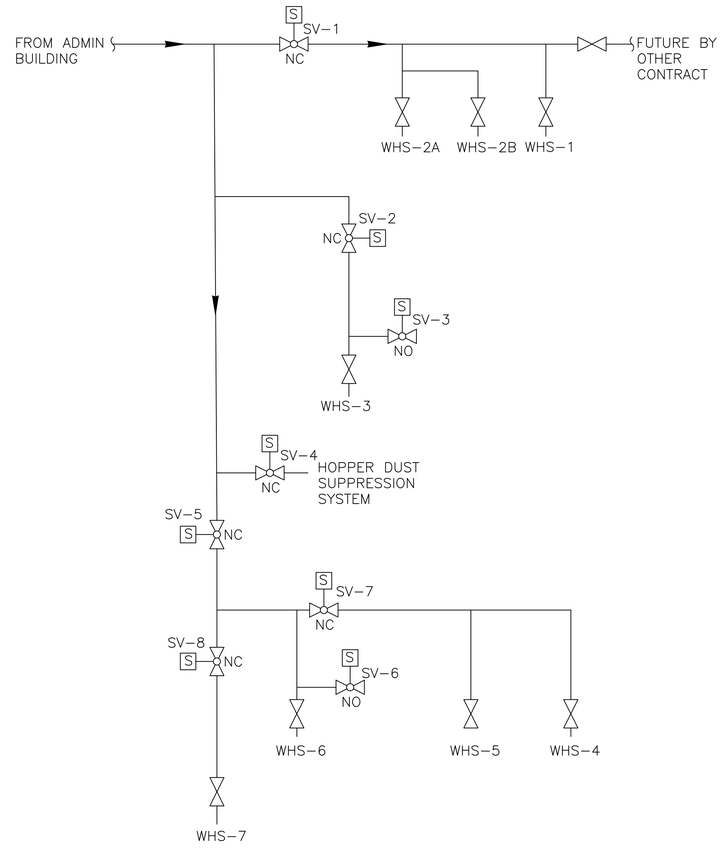
DETAIL 1 / 3/8" = 1'-0"



NOTE: REF: F/PD-1 FOR RPZ DETAIL.

ADMINISTRATION BUILDING PLUMBING ISOMETRIC

DETAIL 2 / NTS



TIPPING BUILDING PROTECTED WATER PROCESS FLOW DIAGRAM

DETAIL 3 / NTS

GENERAL NOTES:

1. INSULATE ALL PIPING IN THE MECHANICAL ROOM AND ALL OUTDOOR PIPING.

KEY NOTES:

(1) REF: G/PD-1 FOR PIPE PENETRATION DETAIL.

(2) REF: H/PD-1 FOR PIPE PENETRATION DETAIL..

(3) UTILIZE THE EXISTING WALL OPENING. SEAL WEATHER TIGHT.

CONTROL DESCRIPTION:

1. TMV-1 IS FACTORY SET TO MAINTAIN AN 85° TEPID WATER TEMPERATURE.
2. ADJUST THE TEMPERATURE CONTROLLER TO START RCP-1 IF THE TW IS 40° AND TO STOP RCP-1 WHEN THE TW IS 45°. RCP-1 SHALL NOT OPERATE WHEN THE ESEW IS IN OPERATION AS INDICATED BY AN OPEN CONTACT AT THE ESEW CONTROL PANEL. REFER TO P-5 FOR THE TEMPERATURE CONTROLLER LOCATION.
3. SET PRV-1 AND PRV-2 TO 75 PSIG.

CONTROL DESCRIPTION:

1. MANUAL WINTERIZATION: SV-1, 7 AND 8 ARE CONTROLLED BY A WALL-MOUNTED SWITCH. OPERATE THE SWITCH TO CLOSE THE VALVES. DRAIN THE WATER IN THE PIPING USING MANUAL GATE VALVES AT WHS-1, 2A, 2B, 4, AND 5.
2. ACTIVE WASH HOSE STATIONS: WHS-3 AND WHS-6 SHALL REMAIN ACTIVE ALL YEAR. IN A FREEZE CONDITION, SV-2 SHALL CLOSE AND SV-3 SHALL OPEN TO DRAIN THE WATER SERVING WHS-3. IN A FREEZE CONDITION, SV-5 SHALL CLOSE AND SV-6 SHALL OPEN TO DRAIN THE WATER SERVING WHS-6.
3. HOPPER DUST SUPPRESSION SYSTEM OPERATION: UTILIZE A REMOTE CONTROL DEVICE TO OPERATE SV-4. SV-4 IS INSTALLED SUCH THAT WHEN IT IS CLOSED THE PIPING DOWNSTREAM OF IT DRAINS BY GRAVITY.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/10/17
CHRISTOPHER ERIC MONROE
NEW MEXICO
23963
PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

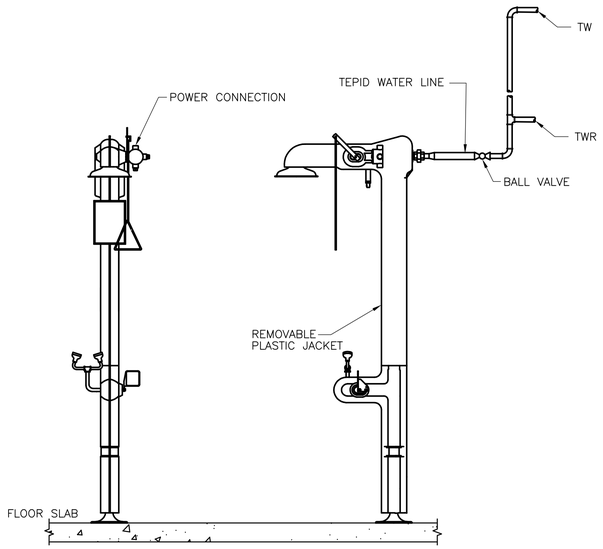
SANTA FE SOLID WASTE MANAGEMENT AGENCY

BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

MISCELLANEOUS PLUMBING

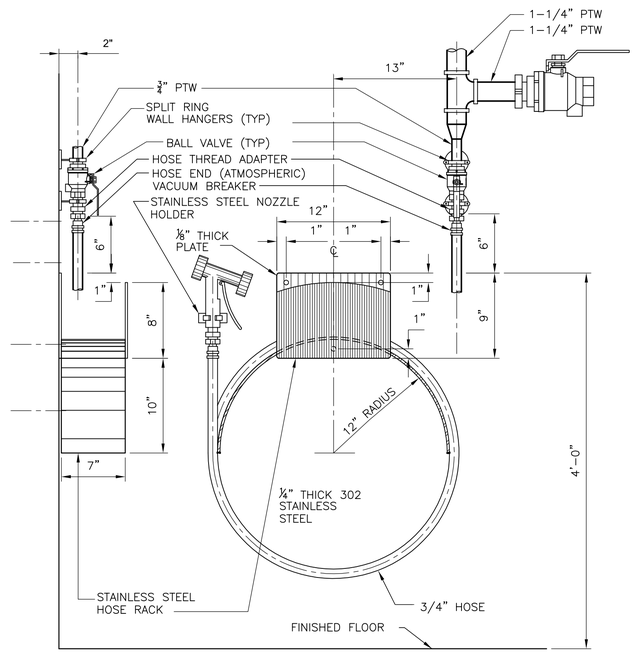
PROJECT NO. 116059-214241
FILE NAME: P007MISC.DWG
SHEET NO.
P-7

ISSUED FOR CONSTRUCTION



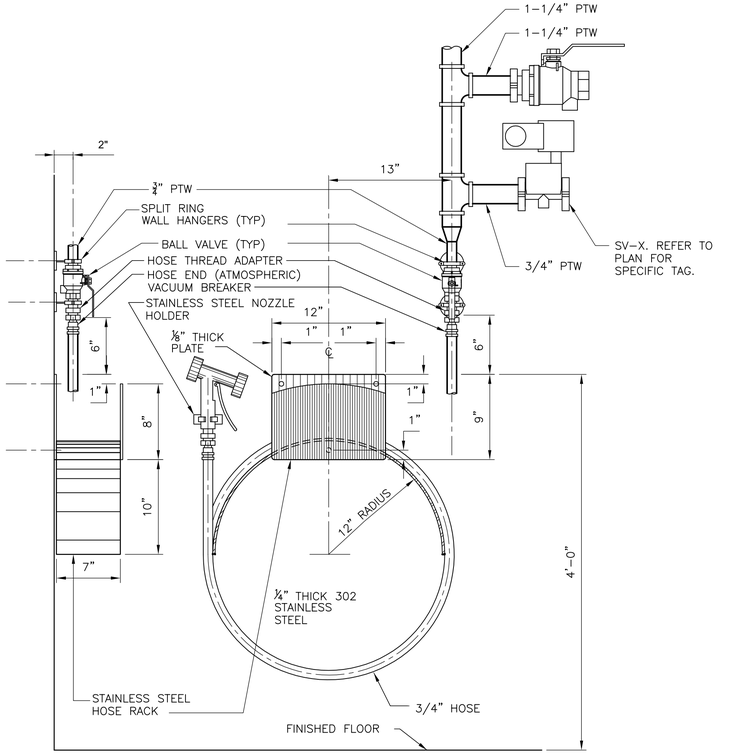
FREEZEPROOF
EMERGENCY SHOWER/EYE WASH UNIT

DETAIL A
NTS



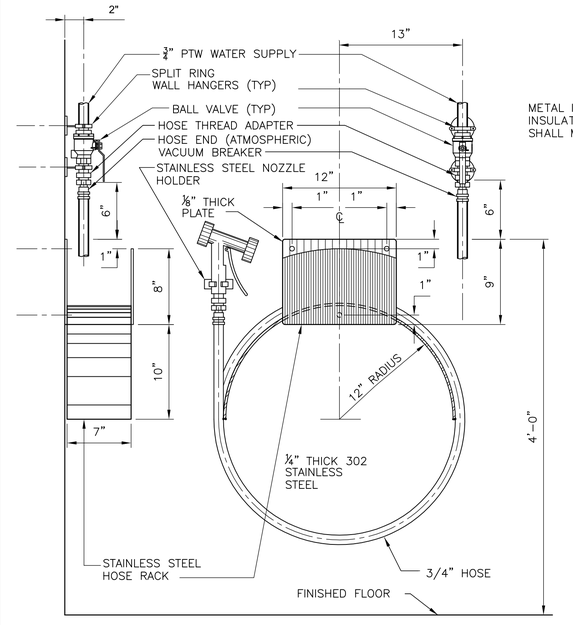
WASH HOSE STATION

DETAIL B
NTS



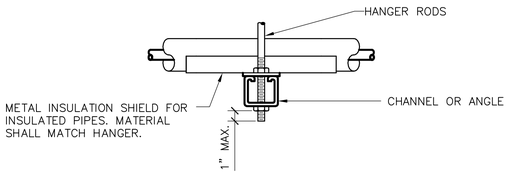
WASH HOSE STATION

DETAIL C
NTS



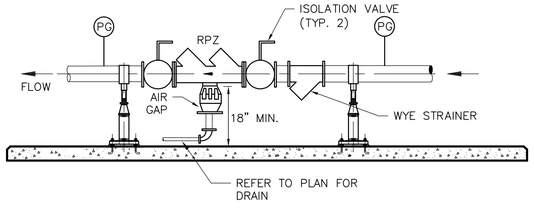
WASH HOSE STATION

DETAIL D
NTS



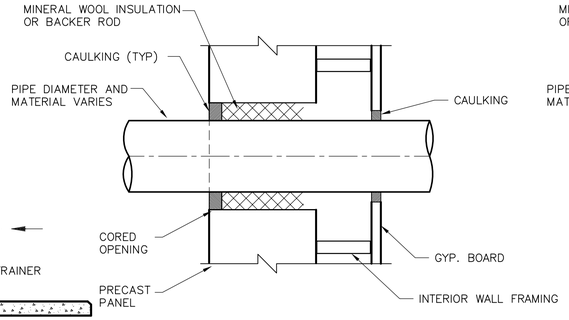
HORIZONTAL PIPE SUPPORT DETAIL

DETAIL E
NTS



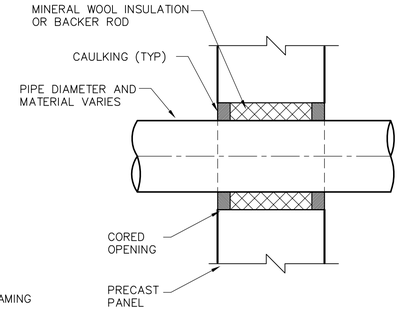
REDUCED PRESSURE ZONE
BACKFLOW PREVENTER

DETAIL F
NTS



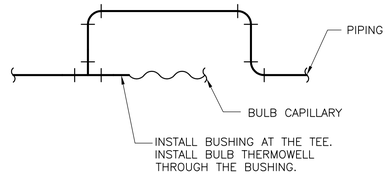
PIPE PENETRATION THROUGH
EXISTING PRECAST PANEL

DETAIL G
NTS



PIPE PENETRATION THROUGH
EXISTING PRECAST PANEL

DETAIL H
NTS



SMALL DIAMETR PIPE
THERMOWELL

DETAIL I
NTS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

5/10/17
CHRISTOPHER ERIC MONROE
NEW MEXICO
23963
PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. MONROE
DRAWN BY: K. BOWEN
SHEET CHK'D BY: E. MONROE
CROSS CHK'D BY: G. LARSON
APPROVED BY: E. MONROE
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

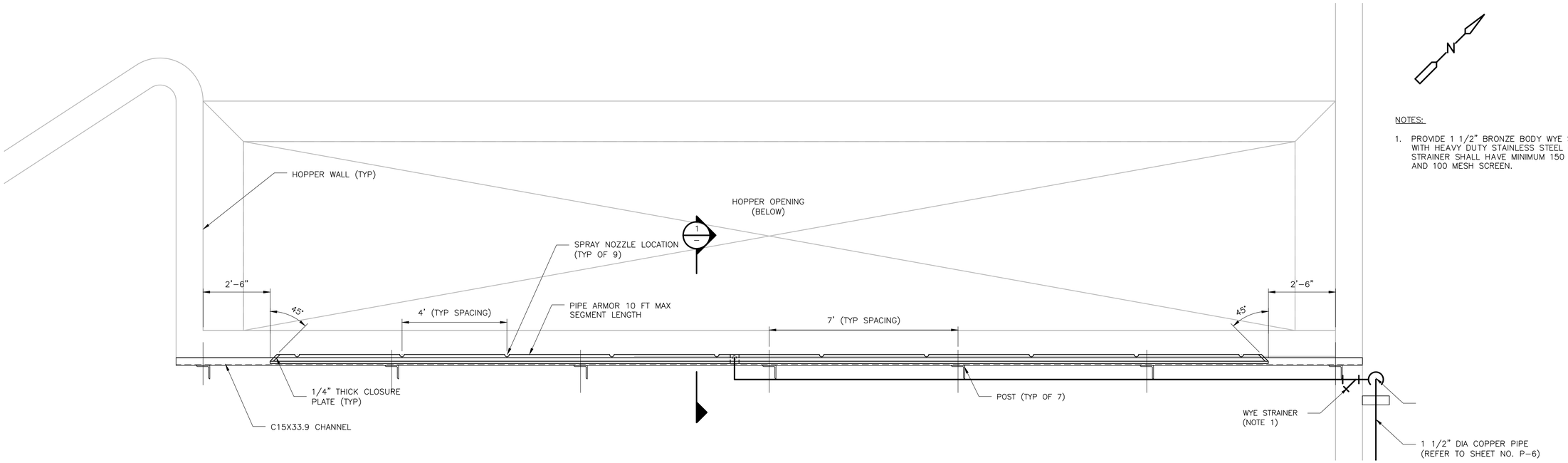
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

PLUMBING DETAILS I

PROJECT NO. 116059-214241
FILE NAME: PD01DETL.DWG

SHEET NO.
PD-1

ISSUED FOR CONSTRUCTION

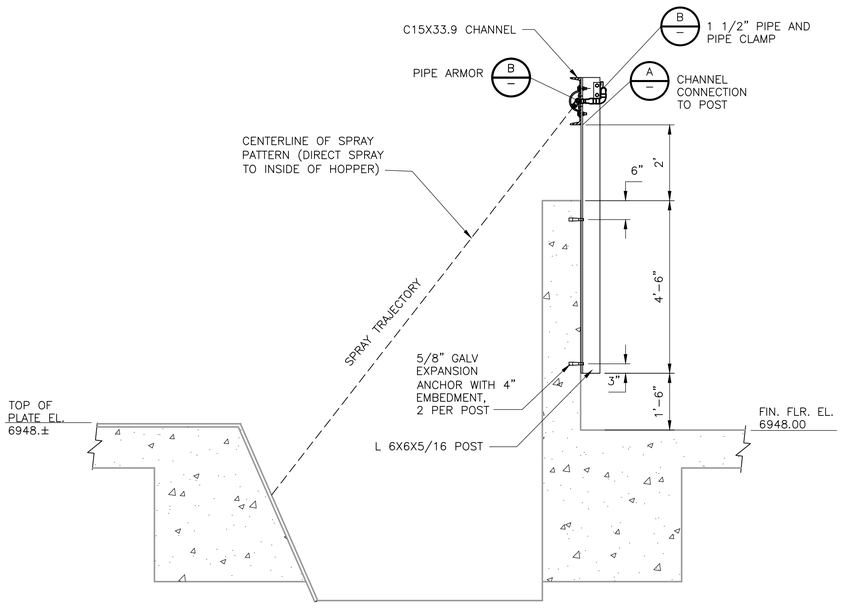


NOTES:

1. PROVIDE 1 1/2" BRONZE BODY WYE STRAINER WITH HEAVY DUTY STAINLESS STEEL WIRE MESH. STRAINER SHALL HAVE MINIMUM 150 PSI RATING AND 100 MESH SCREEN.

HOPPER DUST SUPPRESSION SYSTEM PLAN

1/2" = 1'-0"

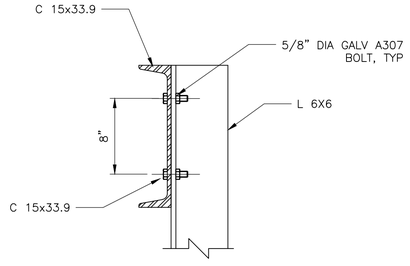


NOTES:

1. STEEL SHAPES AND PLATES TO MEET ASTM A36.
2. ALL STEEL TO BE HOT DIP GALVANIZED PER ASTM A123.

SECTION 1

1/2" = 1'-0"



DETAIL A

1 1/2" = 1'-0"

NOTES:

1. NOZZLES SHALL BE NFD DOVETAIL FLAT FAN BY BETE. CAP AND TIP SIZE SHALL BE A-NFD-097 WITH 1/2" WELD BASE, ALL BRONZE MATERIAL. SPRAY ANGLE SHALL BE 45 DEGREE WITH 5 DEGREE OFFSET ANGLE.
2. INSTALL 1 1/2" PIPE ALONG BACKSIDE OF C-CHANNEL AT HIGHER ELEVATION THAN SPRAY NOZZLES TO PROMOTE DRAINAGE THROUGH NOZZLES WHEN SPRAY SYSTEM SOLENOID VALVE IS CLOSED.

DETAIL B

1 1/2" = 1'-0"

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GREGORY STEVE LARSON NEW MEXICO 20820 5/10/17 PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: G. LARSON
DRAWN BY: R. MESQUITA
SHEET CHK'D BY: A. HAHN
CROSS CHK'D BY: J. STEELE
APPROVED BY: G. LARSON
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

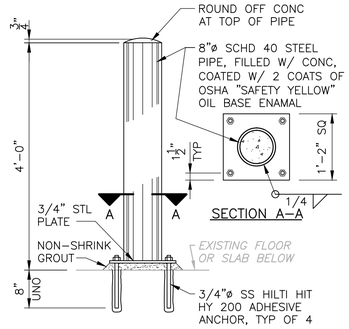
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

HOPPER DUST SUPPRESSION SYSTEM PLAN AND DETAILS

PROJECT NO. 116059-214241
FILE NAME: PD02PLDT.DWG

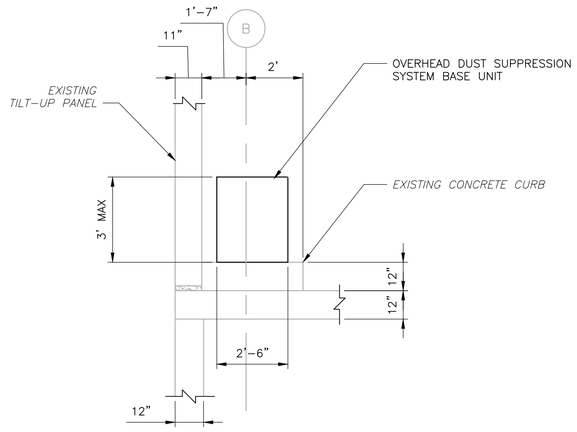
SHEET NO.
PD-2

ISSUED FOR CONSTRUCTION



POST-INSTALLED PIPE BOLLARD

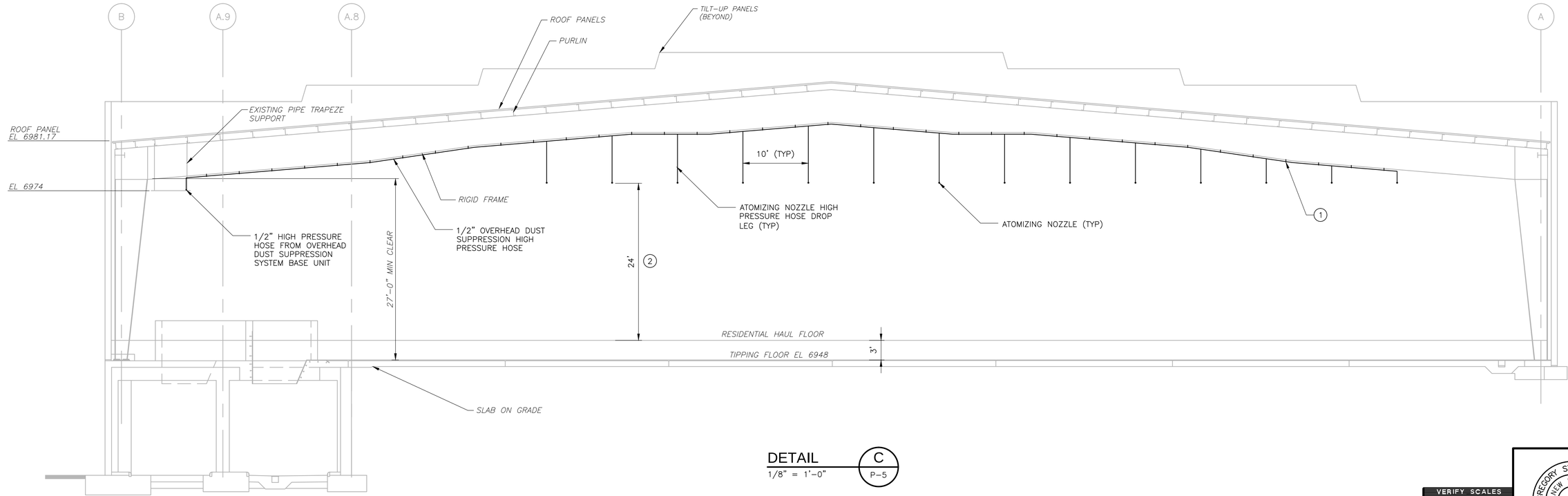
DETAIL A — 3/4" = 1'-0" — P-5



DETAIL B — 3/8" = 1'-0" — P-5

KEYED NOTES:

1. ATTACH HIGH PRESSURE HOSE TO BEAM WITH BEAM CLAMP PER OVERHEAD DUST SUPPRESSION SYSTEM SUPPLIER RECOMMENDATIONS. BEAM CLAMP SPACING PER SUPPLIER RECOMMENDATIONS.
2. ATOMIZING NOZZLE TO BE 24 FEET ABOVE RESIDENTIAL HAUL FLOOR.



DETAIL C — 1/8" = 1'-0" — P-5

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 ——— 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GREGORY STEVE LARSON — NEW MEXICO — 20820 — 5/10/17 — PROFESSIONAL ENGINEER

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: G. LARSON
DRAWN BY: R. MESQUITA
SHEET CHK'D BY: G. LARSON
CROSS CHK'D BY: J. STEELE
APPROVED BY: G. LARSON
DATE: MAY 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

OVERHEAD DUST SUPPRESSION SYSTEM AND MISCELLANEOUS DETAILS

PROJECT NO. 116059-214241
FILE NAME: PD03PLDT.DWG

SHEET NO.
PD-3

ISSUED FOR CONSTRUCTION

ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
52 CS	——	MEDIUM VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER CS=CONTROL SWITCH
FRAME TRIP	CB	LOW VOLTAGE AIR OR MOLDED CASE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED.
*		COMBINATION MOTOR CIRCUIT PROTECTOR AND MAGNETIC MOTOR STARTER, FULL VOLTAGE NON-REVERSING UNLESS OTHERWISE NOTED: * FVR — FULL VOLTAGE REVERSING RVNR — REDUCED VOLTAGE NON-REVERSING RVAT — REDUCED VOLTAGE AUTOTRANSFORMER RVSS — REDUCED VOLTAGE SOLID STATE 2S1W — TWO SPEED, ONE WINDING 2S2W — TWO SPEED, TWO WINDING (DIAGRAMATICALLY SHOWN, CONTRACTOR SHALL FIELD LOCATE)
*		NON-FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE * AMPERE RATING NOTED IF OTHER THAN 30A (DIAGRAMATICALLY SHOWN, CONTRACTOR SHALL FIELD LOCATE)
*	F	FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE, * AMPERE RATING AND FUSE SIZE AS NOTED * AMPERE RATING NOTED IF OTHER THAN 30A FUSE RATING (DIAGRAMATICALLY SHOWN, CONTRACTOR SHALL FIELD LOCATE)
	P 2	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD HEATER, 1 POLE UNLESS OTHERWISE NOTED "P" INDICATES WITH PILOT LIGHT "2" INDICATES TWO POLE (DIAGRAMATICALLY SHOWN, CONTRACTOR SHALL FIELD LOCATE)
	——	DRAWOUT TYPE EQUIPMENT OR DEVICE
	——	MEDIUM VOLTAGE CABLE TERMINATION
	——	MEDIUM VOLTAGE AIR INTERRUPTER SWITCH
*	——	MEDIUM VOLTAGE FUSED AIR INTERRUPTER SWITCH * FUSE RATING
	——	MEDIUM VOLTAGE FUSED MOTOR CONTROLLER
480V KVA 120/208V 3P, 4W	T	TRANSFORMER, RATINGS AND CONNECTIONS AS NOTED. UNLESS OTHERWISE NOTED ON THE SINGLE LINE DIAGRAMS, ALL DRY TYPE TRANSFORMERS SERVICING ADMINISTRATIVE AND LABORATORY SPACES SHALL HAVE A K FACTOR OF 4. ISOLATION TRANSFORMERS SHALL HAVE A K-20 RATING
* A TO 5	——	CURRENT TRANSFORMER * QUANTITY A = PRIMARY AMPERES
* V TO 120	——	POTENTIAL TRANSFORMER * QUANTITY V = PRIMARY VOLTAGE
	G	GENERATOR, RATINGS AND CONNECTIONS AS NOTED
ATS N S 100A	——	AUTOMATIC OR MANUAL TRANSFER SWITCH NO.1 (ATS-1), (MTS-1) "N" INDICATES NORMAL OR PREFERRED SOURCE "S" INDICATES STANDBY OR ALTERNATE SOURCE 100A INDICATES CONTINUOUS CURRENT RATING
*	*	VARIABLE SPEED DRIVE CONTROLLER * D.C. = D.C. DRIVE CONTROLLER SCR = SILICON CONTROLLED RECTIFIER VFD = VARIABLE FREQUENCY DRIVE
#KW	E	UNIT HEATER — ELECTRIC HEATING COIL AND FAN # — RATING
——	U	UNIT HEATER — GAS FIRED, STEAM OR WATER HEATING COIL AND FAN
5	M	MOTOR, NUMERAL INDICATES HORSEPOWER
VS VM *	——	VOLTMETER WITH SWITCH, 3 PHASE
AS AM *	——	AMMETER WITH SWITCH, 3 PHASE

ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
*	——	METER * WM — WATTMETER WHM — WATTHOUR METER WHDM — WATTHOUR DEMAND METER WHDR — WATTHOUR DEMAND RECORDER PF — POWER FACTOR METER DMU — DIGITAL METERING UNIT TRANSDUCER AX — CURRENT TRANSDUCER WX — WATT TRANSDUCER WHX — WATTHOUR TRANSDUCER
*	*	RELAY, NO. AS INDICATED 25 — SYNCHRONISM CHECK RELAY 27 — UNDERVOLTAGE RELAY 32 — DIRECTIONAL POWER RELAY 38 — BEARING PROTECTIVE DEVICE 40 — LOSS OF EXCITATION RELAY 42 — RUNNING CONTACTOR/PILOT RELAY 46 — REVERSE PHASE/PHASE BALANCE/CURRENT RELAY 47 — PHASE SEQUENCE VOLTAGE RELAY 49 — MACHINE OR TRANSFORMER THERMAL RELAY 50/51 — INSTANTANEOUS/TIME OVERCURRENT RELAY 50G — INSTANTANEOUS GROUND 51 — TIME OVERCURRENT RELAY 51G — TIME OVERCURRENT RELAY, GROUNDING RESISTOR TYPE 51N — TIME OVERCURRENT RELAY, RESIDUAL TYPE 51V — TIME OVERCURRENT RELAY WITH VOLTAGE RESTRAINT 51X — AUXILIARY RELAY (TRIPS CB AND ALARMS) 59 — OVERVOLTAGE RELAY 60 — NEGATIVE SEQUENCE VOLTAGE RELAY 62 — TIME DELAY RELAY 63 — OVERPRESSURE RELAY 64 — GENERATOR FIELD GROUND RELAY 67 — AC DIRECTIONAL OVERCURRENT RELAY 74 — ALARM LATCHING RELAY 83 — AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY 86 — LOCKING-OUT RELAY 87 — DIFFERENTIAL PROTECTIVE RELAY B — SUFFIX INDICATES "BUS" G — SUFFIX INDICATES "GENERATOR" GF — GROUND FAULT ST — SHUNT TRIP T — SUFFIX INDICATES "TRANSFORMER" X — SUFFIX INDICATES "AUXILIARY"
*	——	SPECIAL CAPACITOR * SC — SURGE CAPACITOR PF — POWER FACTOR CORRECTION CAPACITOR
*	——	TUNED POWER FACTOR CORRECTION CAPACITOR
	——	PUSHBUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY CLOSED
	——	PUSHBUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY OPEN
	ES	EMERGENCY STOP PUSHBUTTON WITH RED MUSHROOM HEAD OPERATOR (MAINTAINED CONTACT)
STOP START	PBL	START-STOP PUSHBUTTON CONTROL STATION (MOMENTARY CONTACT) WITH LOCKOUT DEVICE ON STOP
	PBM	START-STOP PUSHBUTTON CONTROL STATION, MAINTAINED CONTACT WITH LOCKOUT DEVICE ON STOP
OFF ON	S/S	OFF/ON SELECTOR SWITCH
L R (XO) (OX)	LR	LOCAL/REMOTE SELECTOR SWITCH
A B C* (XOO) (OXO) (OOX)	*	3 POSITION SELECTOR SWITCH, MAINTAINED CONTACT O—OPEN X—CLOSED POSITION / TOP CONTACT / MIDDLE CONTACT / BOTTOM CONTACT A / X / O / O B / O / X / O C / O / O / X NAMEPLATE (A/B/C) HOA — HAND/OFF/AUTO HOR — HAND/OFF/REMOTE LOR — LOCAL/OFF/REMOTE RSL — RAISE/STOP/LOWER TOA — TEST/OFF/AUTO

GD/VF #	GD/VF #	GAS DETECTOR / VENTILATION FAILURE ALARM
		# INDICATES TYPE OF UNIT
		1=MASTER, 2=REMOTE

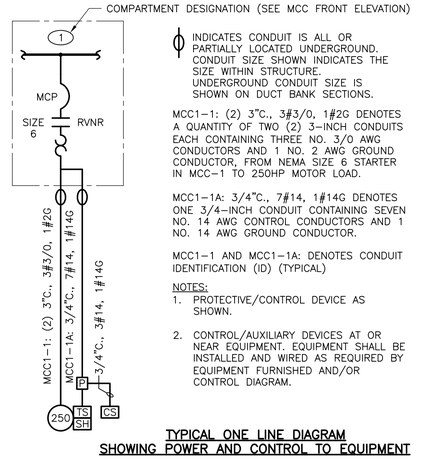
42 #	——	MOTOR STARTER COIL, NUMBER AS INDICATED TO DENOTE INTERLOCKING ONLY
CR #	——	CONTROL RELAY COIL, NUMBER AS INDICATED

ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
*	——	PILOT LIGHT, COLOR AS NOTED * R — RED G — GREEN B — BLUE W — WHITE A — AMBER
*	——	PILOT LIGHT, PUSH-TO-TEST TYPE, COLOR AS NOTED ABOVE.
* RANGE # SETPOINT		TIME DELAY RELAY RANGE AS NOTED SETPOINT AS NOTED # NUMBER AS INDICATED * TDE — TIME DELAY AFTER ENERGIZATION ON DELAY TDD — TIME DELAY AFTER DE-ENERGIZATION OFF DELAY
* NOTC		NOTC — NORMALLY OPEN, TIMED CLOSING WHEN ENERGIZED
NOTO		NOTO — NORMALLY OPEN, TIMED OPENING WHEN DE-ENERGIZED
NCTO		NCTO — NORMALLY CLOSED, TIMED OPENING WHEN ENERGIZED
NCTC		NCTC — NORMALLY CLOSED, TIMED CLOSING WHEN DE-ENERGIZED
——	* — ##	FIELD INSTRUMENT, TAG NO. AS INDICATED * INDICATES INSTRUMENT TYPE DEFINED ON LOOP SHEETS OR P & ID ## INDICATES LOOP NO.
	LS OR ■	LIQUID LEVEL (FLOAT) SWITCH NORMALLY OPEN, CLOSES ON RISING LEVEL NORMALLY CLOSED, OPENS ON RISING LEVEL
	PS OR ■	PRESSURE OR VACUUM SWITCH NORMALLY OPEN, CLOSES ON RISING PRESSURE NORMALLY OPEN, CLOSES ON DROPPING PRESSURE NORMALLY CLOSED, OPENS ON RISING PRESSURE NORMALLY CLOSED, OPENS ON DROPPING PRESSURE
	TS OR T OR ■	TEMPERATURE SWITCH OR THERMOSTAT NORMALLY OPEN, CLOSES ON RISING TEMPERATURE NORMALLY OPEN, CLOSES ON DROPPING TEMPERATURE NORMALLY CLOSED, OPENS ON RISING TEMPERATURE NORMALLY CLOSED, OPENS ON DROPPING TEMPERATURE
	FS OR ■	FLOW SWITCH (AIR, WATER, ETC.) NORMALLY OPEN, CLOSES ON INCREASED FLOW NORMALLY CLOSED, OPENS ON INCREASED FLOW
	ZS OR ■	POSITION (LIMIT) SWITCH NORMALLY OPEN NORMALLY OPEN — HELD CLOSED NORMALLY CLOSED NORMALLY CLOSED — HELD OPEN
	WS OR ■	TORQUE SWITCH NORMALLY OPEN, CLOSES ON HIGH TORQUE NORMALLY CLOSED, OPENS ON HIGH TORQUE
#	——	UTILIZED IN CONJUNCTION WITH OTHER CONTROL SCHEMATIC SYMBOLS TO DEPICT THE PHYSICAL LOCATION OF THE DEVICE # REPRESENTS LOCATION SEE LOCATION LEGEND ON DRAWING
	——	CONDUCTORS OR CONDUITS CROSSING PATHS BUT NOT CONNECTED
	——	CONDUCTORS ELECTRICALLY CONNECTED
	S	SOLENOID VALVE

ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
LA	——	LIGHTNING ARRESTER
		GROUND OR GROUND ROD
30A	——	FUSE, AMPERE RATING AS NOTED
	HTR	STRIP HEATER OR HEATING ELEMENT
	——	INDUCTOR
TG	TG	TACHOMETER GENERATOR
	——	CONTACT, NORMALLY OPEN (NO)
	——	CONTACT, NORMALLY CLOSED (NC)
	——	OVERLOAD RELAY HEATER
*	——	* K = KEY INTERLOCK E = ELECTRICAL INTERLOCK
TB	——	TERMINAL OR TEST BLOCK
RTD	——	RESISTANCE TEMPERATURE DETECTOR
VE OR VE	——	VIBRATION DETECTOR
DM	DM	DAMPER MOTOR
ETM	——	ELAPSED TIME METER
M	M	MOTOR OPERATED VALVE OR GATE
	——	INDICATES LIMITS OF ELECTRICAL EQUIPMENT OR WIRING ENCLOSURE

EXISTING WORK | NEW WORK | FUTURE EXPANSION

EXISTING, NEW OR FUTURE CONDITION DESIGNATION



INDICATES CONDUIT IS ALL OR PARTIALLY LOCATED UNDERGROUND. CONDUIT SIZE SHOWN INDICATES THE SIZE WITHIN STRUCTURE. UNDERGROUND CONDUIT SIZE IS SHOWN ON DUCT BANK SECTIONS.

MCC1-1: (2) 3"C., 3#3/0, 1#2G DENOTES A QUANTITY OF TWO (2) 3-INCH CONDUITS EACH CONTAINING THREE NO. 3/0 AWG CONDUCTORS AND 1 NO. 2 AWG GROUND CONDUCTOR, FROM NEMA SIZE 6 STARTER IN MCC-1 TO 250HP MOTOR LOAD.

MCC1-1A: 3/4"C., 7#14, 1#14G DENOTES ONE 3/4-INCH CONDUIT CONTAINING SEVEN NO. 14 AWG CONTROL CONDUCTORS AND 1 NO. 14 AWG GROUND CONDUCTOR.

MCC1-1 AND MCC1-1A: DENOTES CONDUIT IDENTIFICATION (ID) (TYPICAL)

NOTES:
1. PROTECTIVE/CONTROL DEVICE AS SHOWN.
2. CONTROL/AUXILIARY DEVICES AT OR NEAR EQUIPMENT. EQUIPMENT SHALL BE INSTALLED AND WIRED AS REQUIRED BY EQUIPMENT FURNISHED AND/OR CONTROL DIAGRAM.

TYPICAL ONE LINE DIAGRAM SHOWING POWER AND CONTROL TO EQUIPMENT

NOTES:

1. IN GENERAL CONDUIT ROUTING FOR EQUIPMENT AND DEVICES IS NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS WHICH SHALL INCLUDE CONDUITS SHOWN ON ONE-LINE AND RISER DIAGRAMS AND HOME-RUNS SHOWN ON PLAN DRAWINGS. REFER TO SPECIFICATIONS FOR MATERIALS AND INSTALLATION REQUIREMENTS.
2. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
3. SWITCHGEAR AND MOTOR CONTROL CENTER COMPARTMENT DESIGNATIONS AS INDICATED BELOW:
   - BLANK: NOT INTENDED FOR USE. PLATE ONLY
   - SPACE: EQUIPPED WITH REQUIRED BUS AND HARDWARE FOR THE FUTURE ADDITION OF BREAKERS AND/OR STARTERS WITHIN THE SIZE AND RANGE SHOWN
   - SPARE: CONTAINS A COMPLETELY INSTALLED BREAKER AND/OR STARTER OF SIZE AND TYPE INDICATED FOR FUTURE USE.
4. INTERPRETATION OF ELECTRICAL DRAWINGS: CIRCUIT IDENTIFICATION, ROUTING, AND SIZES OF CONDUITS AND WIRES ARE SHOWN ON THE FOLLOWING DRAWINGS:

A. POWER ONE LINE DIAGRAMS: POWER, CONTROL AND SIGNAL WIRING REQUIREMENTS FOR ELECTRICAL DISTRIBUTION EQUIPMENT AND UTILIZATION EQUIPMENT POWERED FROM SWITCHGEAR, SWITCHBOARDS, MOTOR CONTROL CENTERS AND MAJOR POWER DISTRIBUTION PANELBOARDS ARE TYPICALLY SHOWN ON THE ONE LINE DIAGRAMS. THE PARAMETERS IDENTIFIED ON THE ONE LINE DIAGRAMS ARE: CIRCUIT IDENTIFICATION, CIRCUIT ORIGIN AND DESTINATION, CONDUIT SIZE, WIRE SIZE AND QUANTITY FOR COMPLETE CIRCUIT LENGTH, AND AUXILIARY DEVICES ASSOCIATED WITH THE CONTROL/PROTECTION OF THE POWERED EQUIPMENT, AND SIZE OF THE GROUNDING ELECTRODE CONDUCTORS.

B. INSTRUMENTATION AND CONTROL RISER DIAGRAMS: POWER, CONTROL, SIGNAL AND DATA HIGHWAY WIRING REQUIREMENTS FOR INSTRUMENTS AND CONTROL DEVICES CONTROLLED/MONITORED FROM INSTRUMENTATION AND CONTROL PANELS SUCH AS RTUS, PLCS, TERMINAL CABINETS, AND REMOTE I/O PANELS ARE TYPICALLY SHOWN ON THE INSTRUMENTATION AND CONTROL ONE LINE DIAGRAMS. THE PARAMETERS IDENTIFIED ON THE ONE LINE DIAGRAMS ARE: CIRCUIT IDENTIFICATION, CIRCUIT ORIGIN AND DESTINATION, CONDUIT SIZE, WIRE SIZE, QUANTITY AND TYPE FOR COMPLETE CIRCUIT LENGTH, AND AUXILIARY DEVICES ASSOCIATED WITH THE CONTROL/PROTECTION OF THE POWERED EQUIPMENT.

C. FLOOR PLANS: FOR DETERMINING THE LENGTH OF CIRCUITS LOCATED WITHIN STRUCTURES, FLOOR PLANS SHOW THE LOCATION OF ELECTRICAL DISTRIBUTION EQUIPMENT, CONTROL PANELS, UTILIZATION EQUIPMENT, INSTRUMENTS, ANCILLARY EQUIPMENT AND DEVICES AND THE ANTICIPATED PENETRATION LOCATIONS WHERE CONDUITS EXIT/ENTER THE STRUCTURE. HOMERUNS MAY ALSO BE SHOWN FROM MISCELLANEOUS EQUIPMENT NOT SHOWN ON A ONE LINE OR RISER DIAGRAM.

D. SITE PLANS: FOR DETERMINING THE LENGTH OF CIRCUITS EXTERIOR TO STRUCTURES AND TO IDENTIFY THE SPECIFIC REQUIREMENTS OF THE UNDERGROUND CONDUITS OR DUCT BANKS, SITE PLANS SHOW THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS WITH SECTIONS INDICATING THE CONDUIT SIZE, ARRANGEMENT AND CIRCUIT ROUTING.

E. NOTE THAT CONDUIT SIZE WITHIN STRUCTURE IS INDICATED ON ONE-LINE DIAGRAM AND UNDERGROUND SIZE IS INDICATED ON DUCT BANK SECTIONS.

GENERAL NOTE
THIS IS A STANDARD LEGEND. SOME SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER
SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ELECTRICAL
LEGENDS AND ABBREVIATIONS I

PROJECT NO. 116059-214241
FILE NAME: E001NFLG.DWG
SHEET NO. E-1

ISSUED FOR CONSTRUCTION

SYMBOL	DESCRIPTION
A 3 b	LIGHTING FIXTURE "A" – FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "b" – CONTROLLED BY SWITCH "b" "3" – CIRCUIT NUMBER
A 3 b	LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A 3 b	WALL MOUNTED TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A 3 OR A 3	CROSS HATCH INDICATES LIGHTING FIXTURE THAT IS UNSWITCHED AND SHALL REMAIN ON AT ALL TIMES. NOTATIONS SAME AS ABOVE.
A 3 b OR A 3 b	SHADED AREA INDICATES LIGHTING FIXTURE THAT IS EQUIPPED WITH EMERGENCY BACKUP POWER SOURCE. NOTATIONS SAME AS ABOVE.
A 3	POLE MOUNTED AREA TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A 3	POLE MOUNTED ROADWAY TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
EM 3 (*)	EMERGENCY LIGHTING BATTERY UNIT WITH TWO LAMP HEADS "EM" – FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "3" – SUPERVISORY CIRCUIT * – FIXTURE TAG #
R–2 BU–1(*)	REMOTE EMERGENCY ADJUSTABLE WALL LIGHTING FIXTURE WITH TWO LAMP HEADS "R–2" – FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) * – HOME RUN TO BATTERY UNIT INDICATED. CONDUIT SHALL BE 3/4" AND CONTAIN (2) NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND (1) NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE INDICATED.
A 3	COMBINATION BATTERY UNIT AND EXIT SIGN. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN.
A 3	CEILING MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE. WHEN USED, ARROW INDICATES DIRECTION OF EGRESS. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN. (DOUBLE FACE DOUBLE CHEVRONS SHOWN)
A 3	WALL MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE. WHEN USED, ARROW INDICATES DIRECTION OF EGRESS. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN.
RH–3 E 3 BU–1(*)	REMOTE EMERGENCY CEILING LIGHTING FIXTURE. "RH–3" – FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "3" – SUPERVISORY CIRCUIT * – HOME RUN TO BATTERY UNIT INDICATED. CONDUIT SHALL BE 3/4" AND CONTAIN 2 NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND 1 NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE INDICATED.
	HOME RUN TO DESIGNATED EQUIPMENT. BRANCH CIRCUIT CONDUIT WITH 2 NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND 1 NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE NOTED. NUMBER OF ARROWS INDICATE NUMBER OF CIRCUITS. FOR MINIMUM SIZE CONDUIT PERMITTED REFER TO THE SPECIFICATIONS.
	CONDUIT CONCEALED IN WALL, IN SLAB ABOVE, OR ABOVE CEILING.
	CONDUIT CONCEALED IN OR BELOW FLOOR OR UNDERGROUND.
	CONDUIT RUN EXPOSED. RUN PARALLEL OR PERPENDICULAR TO STRUCTURE OR WALL.
	'X' INDICATES EXPLOSION PROOF CONDUIT SEAL FITTING.
	CONCRETE ENCASED DUCTBANK. WIDTH VARIES, SEE DUCTBANK SECTION/DETAILS FOR REQUIREMENTS AND WIDTH
	CONDUIT STUBBED OUT AND CAPPED
(2) 3"C., 3#3/0, 1#2G	DENOTES A QUANTITY OF TWO (2) 3–INCH CONDUITS EACH CONTAINING THREE NO. 3/0 AWG CONDUCTORS AND 1 NO. 2 AWG GROUND CONDUCTOR.
2–2/C#16 SH	DENOTES A QUANTITY OF TWO INSTRUMENT CABLES. EACH CABLE TO CONSIST OF TWO NO. 16 AWG CONDUCTORS TWISTED TOGETHER AND COVERED WITH A METALLIC SHIELD AND AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
2–3/C#16 SH	SAME AS ABOVE EXCEPT CABLE TO CONSIST OF THREE NO. 16 AWG CONDUCTORS TWISTED, SHIELDED AND COVERED WITH AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
(3) 4"C.	THREE 4–INCH CONDUITS
	FLEXIBLE METAL CONDUIT "WHIP" (3/4"C., 2#12, 1#12G UNLESS OTHERWISE NOTED) FOR LIQUID TIGHT MOTOR CONNECTIONS
	'X' INDICATES CONDUIT SEAL FITTING IN OTHER THAN CODE REQUIRED LOCATIONS.
	INDICATES MOTOR STARTER AND/OR MOTOR CONTROL EQUIPMENT WITHIN THE ENCLOSURE.

SYMBOL	DESCRIPTION
$a	SINGLE POLE SWITCH "a" INDICATES FIXTURES CONTROLLED.
$a 2	DOUBLE POLE SWITCH "a" INDICATES FIXTURES CONTROLLED.
$a 3	THREE WAY SWITCH "c" INDICATES FIXTURES CONTROLLED.
$a 4	FOUR WAY SWITCH "a" INDICATES FIXTURES CONTROLLED.
$a D	DIMMER SWITCH "a" INDICATES FIXTURES CONTROLLED
$OS	SINGLE POLE SWITCH "OS" INDICATES A PASSIVE INFRARED OCCUPANCY SENSOR
$OS 2	DOUBLE POLE SWITCH "OS" INDICATES PROGRAMMABLE OCCUPANCY SENSOR CAPABLE OF INBOARD/OUTBOARD SWITCHING
$DT	SINGLE POLE SWITCH "DT" INDICATES DUAL TECHNOLOGY PROGRAMMABLE OCCUPANCY SENSOR CAPABLE OF SENSING MOTION AND SOUND
C 3	LIGHTING CONTACTOR WITH NUMBER OF POLES AS INDICATED
TM	TIME SWITCH
	PUSH BUTTON STATION
TYPE A	INDICATES ALL LIGHTING FIXTURES WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE TYPE "A" UNLESS OTHERWISE NOTED. SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
	LIGHTING PANELBOARD (LP–#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
	POWER PANELBOARD (PP–#) OR DISTRIBUTION PANELBOARD (DP–#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
	LIGHTING CONTACTOR PANELBOARD (LCP–#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
* 4	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W * GFCI – GROUND FAULT CIRCUIT INTERRUPTER TYPE WP – WEATHERPROOF XP – EXPLOSION PROOF T – TRANSIENT VOLTAGE SURGE SUPPRESSOR IG – ISOLATED GROUND 4 – CIRCUIT NUMBER
* 4	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W MOUNTED ABOVE COUNTER–TOP OR 42" AFF * NOTATIONS SAME AS ABOVE
* 60 3 4W	SPECIAL PURPOSE RECEPTACLE * – VOLT RATING "3" – NUMBER OF POLES "60" – AMPERE RATING "4W" – 4 WIRES IN ADDITION TO GROUND
	MULTI–OUTLET ASSEMBLY, SYMBOL DENOTES RECEPTACLE TYPE
	FLUSH FLOOR OUTLET BOX WITH TYPE OUTLET INDICATED
	UNDER FLOOR DUCT SYSTEM WITH TYPE OUTLETS INDICATED
	THREE CELL UNDER FLOOR DUCT SYSTEM JUNCTION BOX
J OR J	JUNCTION BOX
P	PULL BOX
TC	TERMINAL CABINET
OS	OCCUPANCY SENSOR
PC	PHOTOCELL
ESA	EMERGENCY EYEWASH/SHOWER ALARM STATION WITH FLOW SWITCH(ES)
	INDICATED EQUIPMENT AND MATERIALS TO BE DEMOLISHED
DUST	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 12 CONSTRUCTION (OR GASKETED AND SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHERWISE NOTED.
DAMP OR WET	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4X CONSTRUCTION (OR GASKETED AND SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHERWISE NOTED.
CORROSIVE	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4X CONSTRUCTION (OR CORROSION RESISTANT CONSTRUCTION SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHERWISE NOTED.
CLASS I, DIV. 1 GROUP D	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL CONFORM TO N.E.C. REQUIREMENTS FOR THE HAZARDOUS AREA CLASSIFICATION SHOWN.

SYMBOL	DESCRIPTION
	GROUND SYSTEM GRID OR LOOP, 36" BELOW FINISHED GRADE UNLESS OTHERWISE NOTED.
	EXOTHERMIC WELD CONNECTION
	3/4" x 10'–0" GROUND ROD. UNLESS SPECIFIED OTHERWISE.
	GROUND ROD TEST WELL STATION (SEE DETAIL SHEET FOR REQUIREMENTS)
	COMMUNICATION SYSTEMS
K	TELEPHONE OUTLET FOR DESK TYPE HANDSET K = KEY SYSTEM
K	TELEPHONE OUTLET FOR WALL TYPE HANDSET (MOUNT UP 4'–6") K = KEY SYSTEM
	PAGE/PARTY TELEPHONE OUTLET FOR DESK TYPE HANDSET
	PAGE/PARTY TELEPHONE OUTLET FOR WALL TYPE HANDSET, MOUNT UP 4'–6"
S H W	PAGING SPEAKER, WALL MOUNTED H = HORN TYPE W = WIDE ANGLE TYPE
S W	PAGING SPEAKER, WALL MOUNTED, BI–DIRECTIONAL, HORN TYPE W = WIDE ANGLE TYPE
S	PAGING SPEAKER, FLUSH MOUNTED CEILING TYPE
S	PAGING SPEAKER, SURFACE MOUNTED CEILING TYPE
VC	REMOTE WALL MOUNTED VOLUME CONTROL FOR CEILING SPEAKER, MOUNT UP 5'–0"
A	PAGING SPEAKER AMPLIFIER ASSEMBLY
TM	TELEPHONE CABINET OR BACKBOARD AS NOTED
P OR C	"C" – DATA INPUT/OUTPUT CABLE OUTLET "P" – PROCESS COMPUTER SYSTEM (CAT6 RJ–45 JACK)

GD/VF #	GAS DETECTOR/VENTILATION FAILURE ALARM,
	# INDICATES TYPE OF UNIT.
	1 = MASTER, 2 = REMOTE

GB	GAS DETECTION/VENTILATION FAILURE WEATHERPROOF DUAL–LITE BEACON MOUNT TOP OF DEVICE UP 6'–8" A.F.F.
HS G	GAS DETECTION/VENTILATION FAILURE HORN/STROBE MOUNT TOP OF DEVICE UP 6'–8" A.F.F.
G	GAS DETECTION/VENTILATION FAILURE HORN, MOUNT TOP OF DEVICE UP 6'–8" A.F.F.
G	GAS DETECTION/VENTILATION FAILURE STROBE, MOUNT TOP OF DEVICE UP 6'–8" A.F.F.
	SECURITY SYSTEMS
SACP	SECURITY ALARM CONTROL PANEL
DS	SECURITY ALARM DOOR SWITCH
K	SECURITY ALARM KEY PAD
R	SECURITY SYSTEM CARD ACCESS READER
WS	SECURITY ALARM WINDOW SWITCH
	SECURITY ALARM MOTION DETECTOR
CCTV	CLOSED CIRCUIT TV CAMERA
PTZ	PAN, TILT, ZOOM CAMERA LENS CONTROLS
GB	GLASS BREAK DETECTOR
	FIRE ALARM SYSTEMS
H 200 R	FIRE ALARM HEAT DETECTOR 135 FIXED TEMPERATURE UNLESS OTHERWISE NOTED. "200" – 200 FIXED TEMPERATURE "R" – FIXED TEMPERATURE RATE–OF–RISE TYPE
I	FIRE ALARM SMOKE DETECTOR PHOTOELECTRIC TYPE UNLESS OTHERWISE NOTED. "I" – IONIZATION TYPE.
D	FIRE ALARM DUCT SMOKE DETECTOR
FACP	FIRE ALARM CONTROL PANEL
FV	FIRE ALARM VENTILATION PANEL WITH GRAPHIC PANEL
FA	REMOTE FIRE ALARM ANNUNCIATOR PANEL

SYMBOL	DESCRIPTION
F	FIRE ALARM MASTER BOX
F	FIRE ALARM HORN, MOUNT UP 7'–6"
15 F	FIRE ALARM STROBE, MOUNT UP 6'–8" 15 = CANDELA RATING
15 F	FIRE ALARM HORN AND STROBE LIGHT COMBINATION, MOUNT UP 6'–8" 15 = CANDELA RATING
F	FIRE ALARM MANUAL PULL STATION, MOUNT UP 4'–0"
VSS	SPRINKLER VALVE SUPERVISORY SWITCH
SFS	SPRINKLER FLOW ALARM SWITCH
F	FIRE ALARM BELL
FB	WEATHERPROOF HI–INTENSITY FIRE ALARM STROBE LIGHT WITH HORN
PIR	PASSIVE INFRARED DETECTOR
R	SMOKE BEAM DETECTOR (RECEIVER)
T	SMOKE BEAM DETECTOR (TRANSMITTER)
	FIRE ALARM SMOKE DETECTOR REMOTE INDICATOR AND TEST SWITCH

ABBREVIATIONS	
A	AMPS
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AL	ALUMINUM
AIC	AMPERE INTERRUPTING CAPACITY
AMP	AMPERE
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CGD	COMBUSTIBLE GAS DETECTOR
CKT	CIRCUIT
CLB	CURRENT LIMITING BREAKER
CLF	CURRENT LIMITING FUSE
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CS	CONTROL SWITCH/CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
CWS	CONDUIT WALL SEAL
DC	DIRECT CURRENT
DIA	DIAMETER
DMU	DIGITAL METERING UNIT
DN	DOWN
EC	EMPTY CONDUIT
ELEC	ELECTRICAL

ABBREVIATIONS (CONTINUED)	
ELEV	ELEVATION
EM	EMERGENCY
ENCL	ENCLOSURE OR ENCLOSED
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING
FO	FIBER OPTIC
FU	FUSE
GCP	GENERATOR CONTROL PANEL
GEN	GENERATOR
G, GND	GROUND
GFI	GROUND FAULT INTERRUPTER
GRS	GALVANIZED RIGID STEEL
HACR	HEATING & AIR CONDITIONING RATED
HH	HANDHOLE
HT	HEIGHT
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
HZ	HERTZ
ID	IDENTIFICATION
INSTR	INSTRUMENT
K	KILO (PREFIX)
kcmil	1000 CIRCULAR MILS
KVA	KILOVOLT AMPERES
KW	KILOWATTS
LA	LIGHTNING ARRESTER
LTG	LIGHTING
LP	LIGHTING PANEL
LV	LOW VOLTAGE
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
MV	MEDIUM VOLTAGE
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN OR NUMBER
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOAD
PB	PULL BOX
PCP	PUMP CONTROL PANEL
PH	PHASE
PMH	POWER MANHOLE
PNL	PANEL OR PANELBOARD
PR	PAIR
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RECPT	RECEPTACLE
REQD	REQUIRED
QTY	QUANTITY
SA	SURGE ARRESTER
SEC	SECONDS OR SECONDARY
SH	SHIELDED OR SPACE HEATER
SHH	SIGNAL HANDHOLE
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TC	TIME TO CLOSE OR TRAY CABLE
TEL	TELEPHONE
TO	TIME TO OPEN
TS	TWISTED SHIELDED OR THERMAL SWITCH
TYP	TYPICAL
UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPS
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS, WIDTH, WITH, WIRE
WP	WEATHERPROOF
XP	EXPLOSION PROOF
XFMR	TRANSFORMER

A / E–4 — SHEET NO. WHERE DETAIL IS DRAWN

SYMBOL WHERE THERE IS A DETAIL

DETAIL A, 1/4" = 1'–0" — E–3 — SHEET NO. WHERE THERE IS A DETAIL

SYMBOL WHERE DETAIL IS DRAWN

DETAIL SYMBOL

1 / E–4 — SHEET NO. WHERE SECTION IS DRAWN

SYMBOL WHERE THERE IS A SECTION

SECTION 1, 1/4" = 1'–0" — E–3 — SHEET NO. WHERE SECTION IS TAKEN

SYMBOL WHERE SECTION IS DRAWN

SECTION SYMBOL

GENERAL NOTE
THIS IS A STANDARD LEGEND. SOME SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN, NEW MEXICO, 23658, PROFESSIONAL ENGINEER
SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

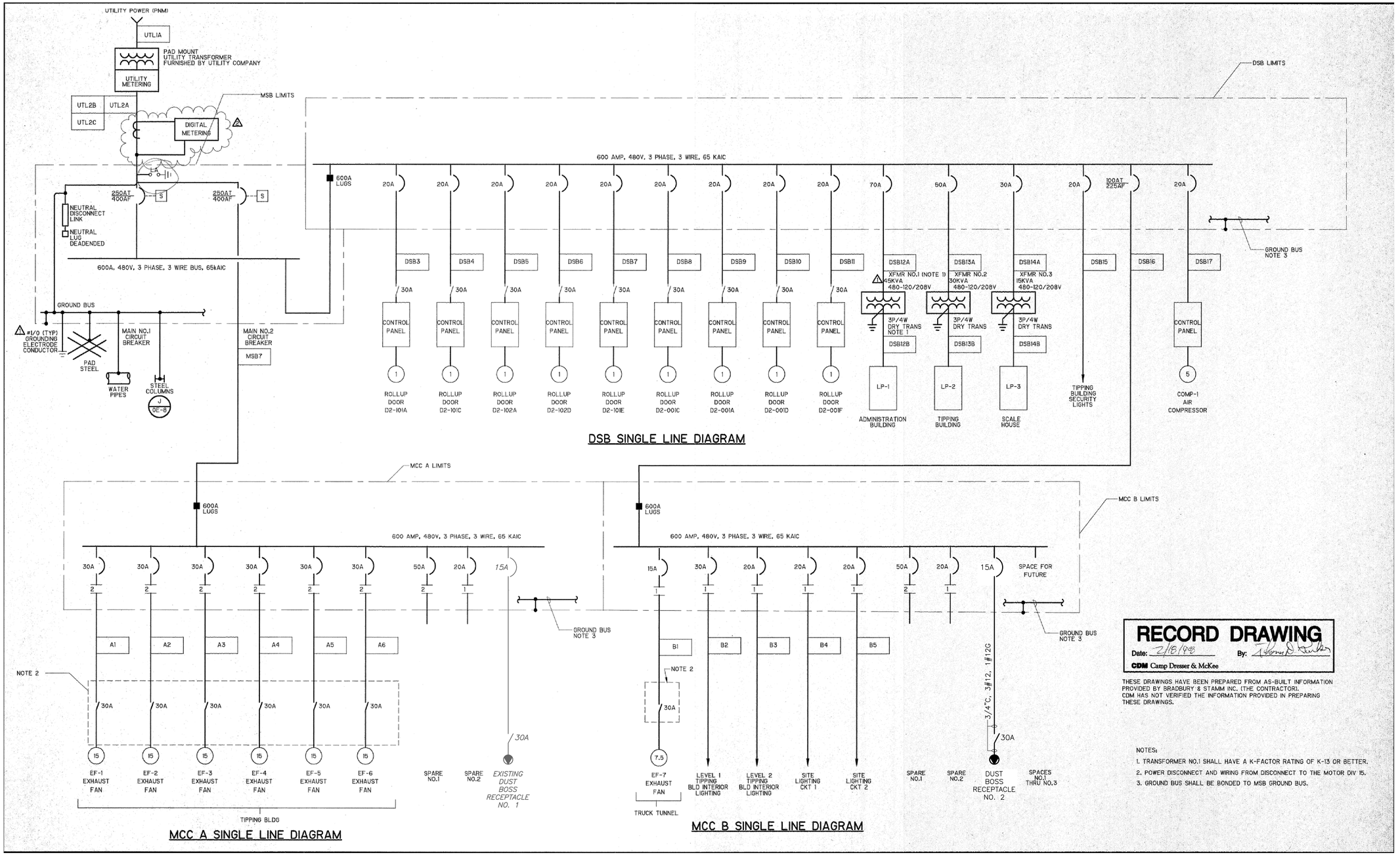
CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ELECTRICAL
LEGENDS AND ABBREVIATIONS II

PROJECT NO. 116059–214241
FILE NAME: E002NFLG.DWG
SHEET NO.
E-2

ISSUED FOR CONSTRUCTION



DSB SINGLE LINE DIAGRAM

MCC A SINGLE LINE DIAGRAM

MCC B SINGLE LINE DIAGRAM

RECORD DRAWING
Date: 2/18/98 By:
CDM Camp Dresser & McKee

THESE DRAWINGS HAVE BEEN PREPARED FROM AS-BUILT INFORMATION PROVIDED BY BRADBURY & STAMM INC. (THE CONTRACTOR). CDM HAS NOT VERIFIED THE INFORMATION PROVIDED IN PREPARING THESE DRAWINGS.

NOTES:
1. TRANSFORMER NO.1 SHALL HAVE A K-FACTOR RATING OF K-13 OR BETTER.
2. POWER DISCONNECT AND WIRING FROM DISCONNECT TO THE MOTOR DIV 15.
3. GROUND BUS SHALL BE BONDED TO MSB GROUND BUS.

ELECTRICAL SINGLE-LINE DIAGRAM 1
N.T.S.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER
SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

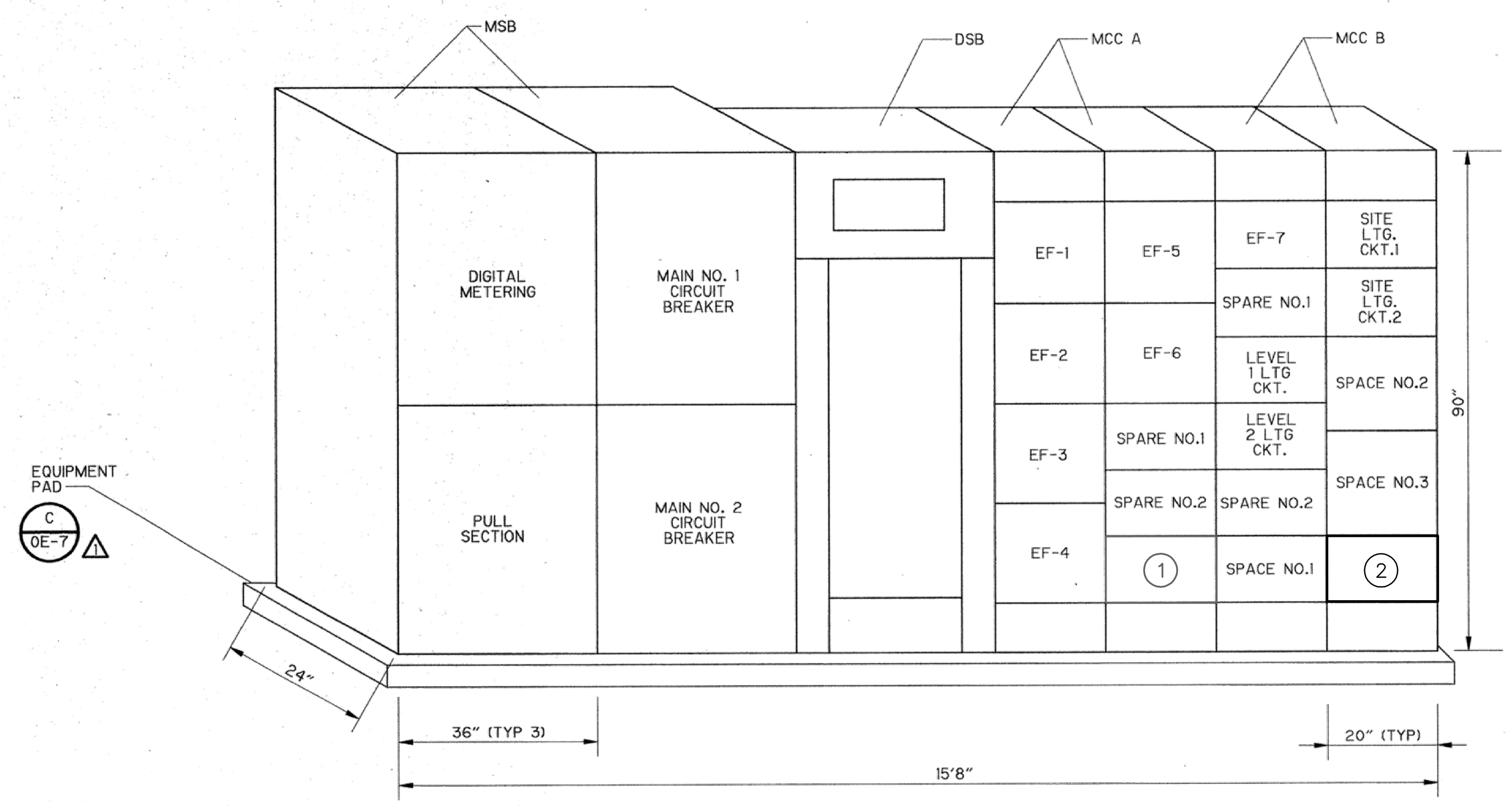
ELECTRICAL
SINGLE-LINE DIAGRAM

PROJECT NO. 116059-214241
FILE NAME: E003SLD1.DWG
SHEET NO.
E-3

ISSUED FOR CONSTRUCTION

KEYED NOTES:

1. EXISTING DUST BOSS RECEPTACLE NO. 1.
2. DUST BOSS RECEPTACLE NO. 2.



MAIN SWITCHBOARD (MSB), DISTRIBUTION SWITCHBOARD (DSB) AND MCC A AND B ELEVATION

ELECTRICAL MCC–A/B

ELEVATION

N.T.S.

RECORD DRAWING

Date: 2/18/98 By: [signature]

CDM Camp Dresser & McKee

THESE DRAWINGS HAVE BEEN PREPARED FROM AS-BUILT INFORMATION PROVIDED BY BRADBURY & STAMM INC. (THE CONTRACTOR). CDM HAS NOT VERIFIED THE INFORMATION PROVIDED IN PREPARING THESE DRAWINGS.

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER

SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS

DRAWN BY: T. ADAMS

SHEET CHK'D BY: T. NGUYEN

CROSS CHK'D BY: B. FRANSEN

APPROVED BY: G. LARSON

DATE: APRIL 2017

CDM Smith

6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ELECTRICAL
MCC ELEVATION

PROJECT NO. 116059–214241

FILE NAME: E004ELEV.DWG

SHEET NO.

E-4

ISSUED FOR CONSTRUCTION

XREFs: [CDMS_2234] Images: []
Last saved by: ADAMSTC Time: 5/8/2017 2:34:43 PM
pw:\\Projectwiseint2.cdm.com:PW_PL1\116059\214241\04 Design Services NM_60%\09 Electrical\10 CADD\E004ELEV.dwg

150 AMP MAIN BREAKER — **EXISTING LP-1** — LOCATION: **ELECTRICAL ROOM**
150 AMP BUS RATING **42** POLES **10** KA SHORT CIRCUIT RATING ENCLOSURE RATING: **NEMA 12 ,**
208/120 VOLTS **3** PHASE **4** WIRE **60 Hz.** ELECTRONIC GRADE: **NO** MOUNTING: **SURFACE**

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	AHU-1	0.865			20 /1	
3	AHU-2		0.865		20 /1	
5	EF-8 (BATHROOMS)			0.6	20 /1	
7	RECEPTACLES	1.08			20 /1	
9	RECEPTACLES		1.44		20 /1	
11	RECEPTACLES			1.44	20 /1	
13	RECEPTACLES	1.44			20 /1	
15	DRINKING FOUNTAINS		0.6		20 /1	
17	LIGHTS			1.56	20 /1	
19	SITE LIGHTING CONTROL	0.75			20 /1	
21	KITCHEN STOVE		2.84		40 /3	
23				2.84		
25		2.84				
27	KITCHEN RECEPTACLE		0.7		20 /1	
29	MICROWAVE			0.75	20 /1	
31	REFRIGERATOR	0.6			20 /1	
33	GARBAGE DISPOSAL		1.56		20 /1	
35	EXTERIOR LIGHTS			0.75	20 /1	
37	LIGHTS	1.44			20 /1	
39	WASHER/DRYER				30 /2	
41						
	TOTAL PHASE KVA THIS SIDE	8.915	8.105	7.94		

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	EF-9 (ELECTRICAL ROOM)	0.4			20 /1	
4	ACCU-1		1.5		20 /3	
6				1.5		
8		1.5				
10	ACCU-2		1.5		20 /3	
12				1.5		
14		1.5				
16	SECURITY & EMERGENCY LIGHTS		0.4		20 /1	
18	FIRE ALARM EXPANDERS				20 /1	
20	SPARE				30 /2	
22						
24	SPARE				30 /2	
26						
28	HEAT TRACE CONTROLLER (HTC-1)		0.96		20 /2	5
30				0.96		
32	FACP	0.25			20 /1	
34	WASH-HOSE STATION CP (WHS-CP)		0.93		20 /1	7
36	HEATER (ELECTRICAL ROOM) HTR-2			1	20 /3	
38		1				
40			1			
42	LIGHTS (MEN'S BATHROOM)			0.54	20 /1	
	TOTAL PHASE KVA THIS SIDE	4.65	6.69	5.5		
	TOTAL KVA PER PHASE	13.565	14.795	13.44		
	TOTAL THREE PHASE KVA	41.8				

NOTES:
1. PROVIDE LOCKING HARDWARE
3. 30 ma GFI CIRCUIT BREAKER FOR EQUIPMENT PROTECTION ONLY (HEAT TRACE)
6. BRANCH CIRCUIT WIRING: 3/4"C, 3#12 & 1#12G
7. BRANCH CIRCUIT WIRING: 3/4"C, 2#12 & 1#12G

NOTES CONT.:
2. 5 ma GROUND FAULT INTERRUPTER (GFI) CIRCUIT BREAKER
4. PROVIDE LOCKING HARDWARE & PAINT BREAKER HANDLE RED (FACP)
6. BRANCH CIRCUIT WIRING: 3/4"C, 2#10 & 1#10G
8. BRANCH CIRCUIT WIRING: 1-1/4"C, 3#4 & 1#8G

100 AMP MAIN BREAKER — **EXISTING LP-2** — LOCATION: **TIPPING FLOOR**
100 AMP BUS RATING **42** POLES **10** KA SHORT CIRCUIT RATING ENCLOSURE RATING: **NEMA 12 ,**
208/120 VOLTS **3** PHASE **4** WIRE **60 Hz.** ELECTRONIC GRADE: **NO** MOUNTING: **SURFACE**

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	SPARE				20 /1	
3	RADIANT HEATING CONTROL		0.5		20 /1	
5	TUNNEL LIGHTING LVL 1			1.21	20 /2	
7		1.21				
9	TUNNEL LIGHTING SECURITY		0.47		20 /2	
11	SPARE			0.47		
13	SPARE				20 /1	
15	DUST SUPPRESSION CONTROL PNL		0.25		20 /1	
17	HAZARDOUS MATERIAL			1.33		
19	STORAGE BUILDING	1.33			70 /3	
21			1.33			
23	OVERHEAD DUST SUPPRESSION			0.82		
25	SYSTEM BASE UNIT	0.82			20 /3	5
27			0.82			
29	EMERGENCY EYEWASH STATION (ESEW)			0.11	20 /1	7
31	SPARE				20 /2	
33						
35	SPACE				/1	
37	SPACE				/1	
39	SPACE				/1	
41	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	3.36	3.37	3.94		

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	EYEWASH STATIONS	0.24			20 /1	
4	LIGHTING CONTACTOR CONTROL CIRCUIT		0.25		20 /1	
6	TUNNEL LIGHTING LVL 2			1.67	20 /2	
8		1.67				
10	EMERGENCY LIGHTS		0.58		20 /1	
12	CAMERAS			0.05	20 /1	
14	RECEPTACLES (SOUTH)	0.72			20 /1	3
16	RECEPTACLES (NORTH)		0.72		20 /1	3
18	RECEPTACLES (TUNNEL)			1.08	20 /1	3
20	BLOCK HEATER (TUNNEL)	1.5			20 /1	3
22	BLOCK HEATER		1.5		20 /1	3
24	BLOCK HEATER			1.5	20 /1	3
26	BLOCK HEATER	1.5			20 /1	3
28	BLOCK HEATER		1.5		20 /1	3
30	BLOCK HEATER			1.5	20 /1	3
32	BLOCK HEATER	1.5			20 /1	3
34	BLOCK HEATER (TUNNEL)		1.5		20 /1	3
36	SPACE				/1	
38	SPACE				/1	
40	SPACE				/1	
42	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	7.13	6.05	5.8		
	TOTAL KVA PER PHASE	10.49	9.42	9.74		
	TOTAL THREE PHASE KVA	29.65				

NOTES:
1. PROVIDE LOCKING HARDWARE
3. 30 ma GFI CIRCUIT BREAKER FOR EQUIPMENT PROTECTION ONLY (HEAT TRACE)
6. BRANCH CIRCUIT WIRING: 3/4"C, 3#12 & 1#12G
7. BRANCH CIRCUIT WIRING: 3/4"C, 2#12 & 1#12G

NOTES CONT.:
2. 5 ma GROUND FAULT INTERRUPTER (GFI) CIRCUIT BREAKER
4. PROVIDE LOCKING HARDWARE & PAINT BREAKER HANDLE RED (FACP)
6. BRANCH CIRCUIT WIRING: 3/4"C, 3#10 & 1#12G

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ELECTRICAL SCHEDULES

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER
SIGNED: 05/08/2017

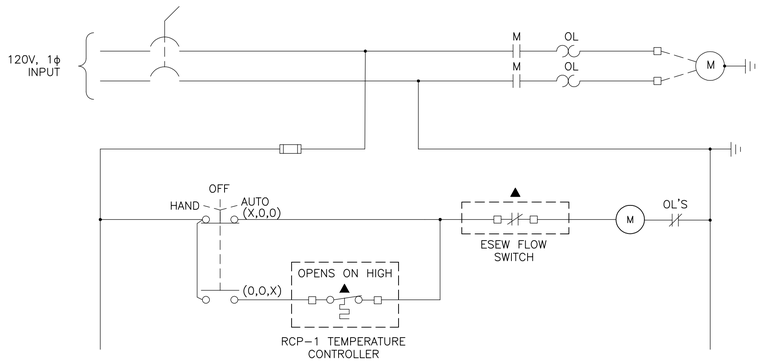
PROJECT NO. 116059-214241
FILE NAME: E005SCHD.DWG
SHEET NO. E-5

ISSUED FOR CONSTRUCTION

XREFs: [CDMS_2234] Images: []
Last saved by: ADAMSTC Time: 5/8/2017 2:35:40 PM
pw:\\Projectwseint2.cdm.com:PW_PLT\116059\214241\04 Design Services NM_60%\09 Electrical\10 CADD\E005SCHD.dwg

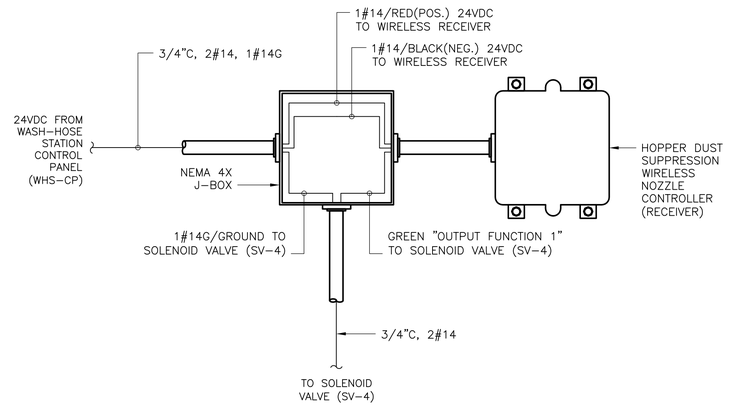
LEGEND

- AI — ANALOG INPUT
- AO — ANALOG OUTPUT
- DI — DIGITAL INPUT
- DO — DIGITAL OUTPUT
- ▲ DEVICE LOCATED IN FIELD
- ■ DEVICE LOCATED AT MCC
- ◆ DEVICE LOCATED IN STARTER
- ● DEVICE LOCATED IN DCS
- ◪ DEVICE LOCATED AT DRIVE PANEL
- □ TERMINAL BLOCKS LOCATED IN LOCAL CONTROL STATION
- ETM ELAPSED TIME METER
- SP SURGE PROTECTION



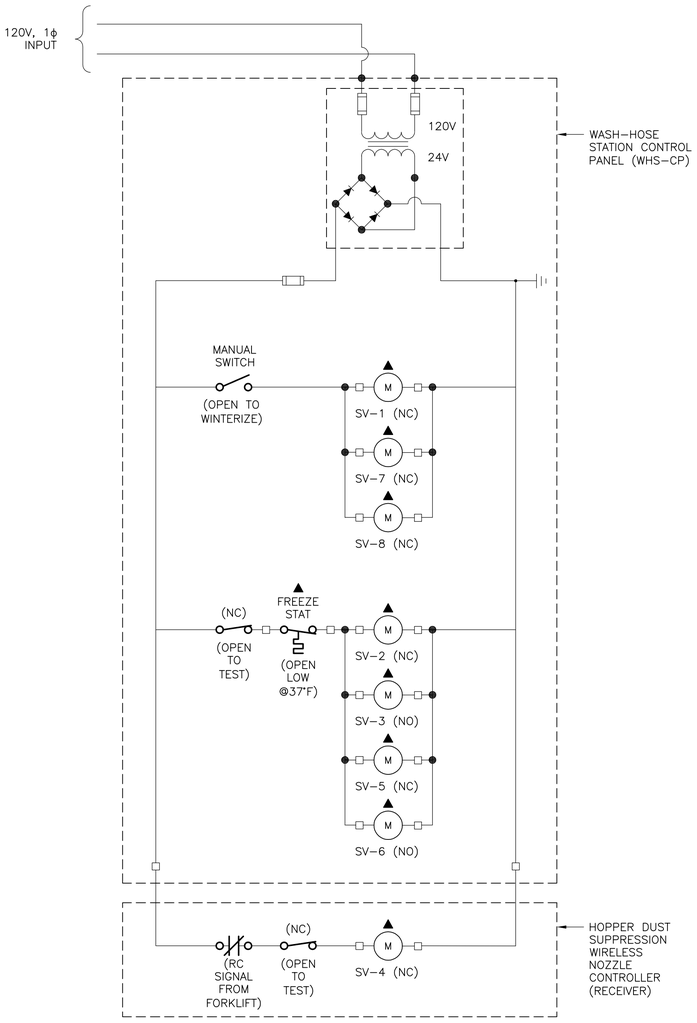
RECIRCULATION PUMP (RCP-1) STARTER SCHEMATIC

DIAGRAM 1 — NTS — E-9



HOPPER DUST SUPPRESSION WIRELESS NOZZEL CONTROLLER (RECEIVER) AND SOLENOID VALVE (SV-4) WIRING

DIAGRAM 3 — NTS — E-8



WASH-HOSE STATION CONTROL PANEL (WHS-CP) SCHEMATIC

DIAGRAM 2 — NTS — E-9

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN — NEW MEXICO — 23658 — PROFESSIONAL ENGINEER

SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

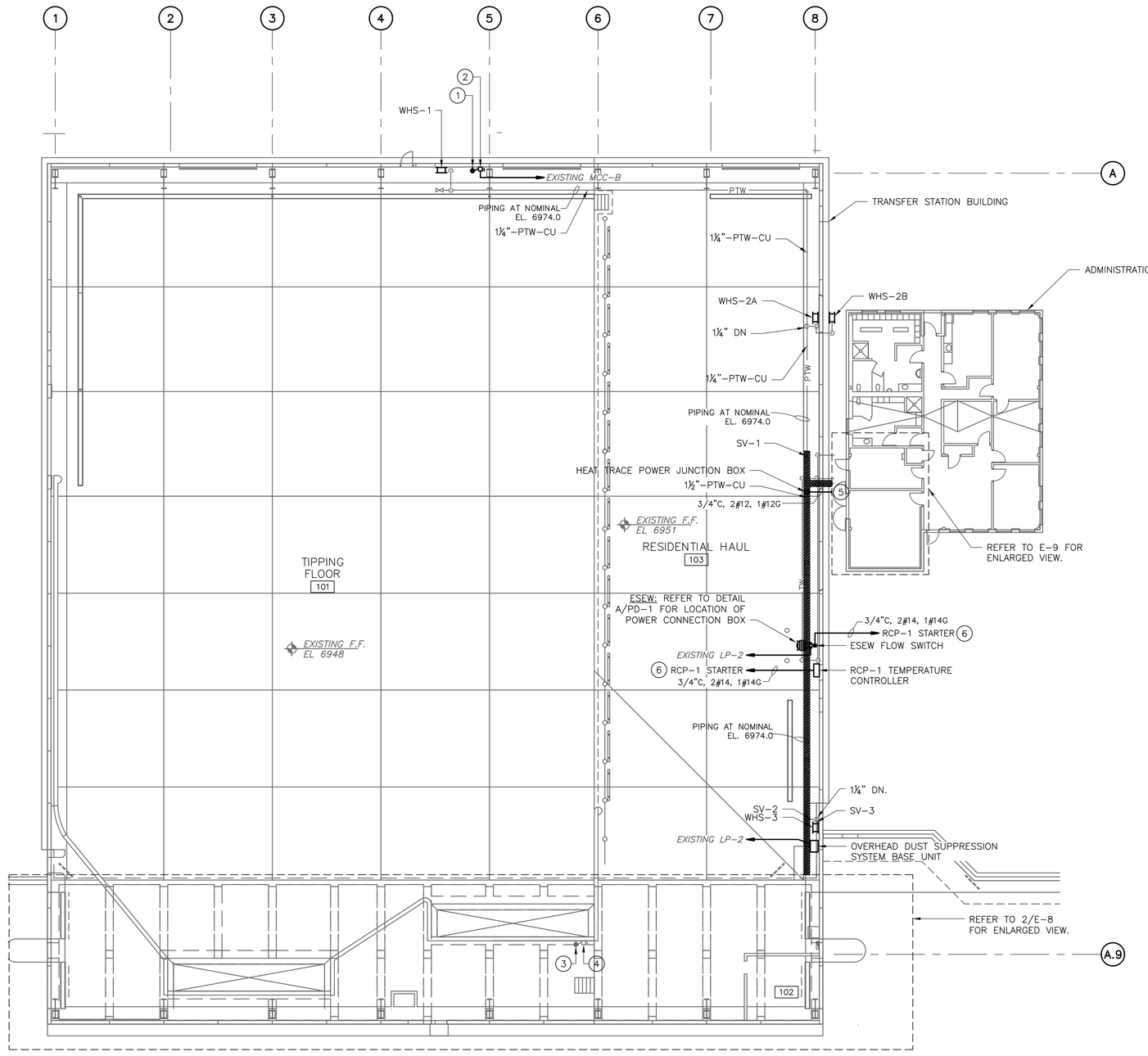
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ELECTRICAL SCHEMATICS

PROJECT NO. 116059-214241
FILE NAME: E0065CHM.DWG

SHEET NO. E-6

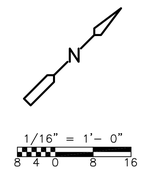
ISSUED FOR CONSTRUCTION



TIPPING BUILDING – ELECTRICAL POWER

PLAN I

1/16" = 1'-0"



GENERAL NOTES:

1. REFER TO ELECTRICAL SINGLE-LINE DIAGRAM ON SHEET E-3 AND ELECTRICAL SCHEDULES ON SHEET E-5 FOR CONDUIT AND WIRE REQUIREMENTS.

KEYED NOTES:

(1) DUST BOSS RECEPTACLE NO. 2:
15A, 480V, 3ϕ, 3W, NEMA 4X

(2) DUST BOSS RECEPTACLE NO. 2 DISCONNECT:
30A, 480V, 3ϕ, 3W, NEMA 4X

(3) EXISTING DUST BOSS RECEPTACLE NO. 1

(4) EXISTING DUST BOSS RECEPTACLE NO. 1 DISCONNECT.

(5) REFER TO SHEET E-9 FOR CONTINUATION. MOUNTING HEIGHT OF CONDUIT BETWEEN TIPPING AND ADMINISTRATION BUILDINGS SHALL BE 9'-0" A.F.G. MINIMUM. CONTRACTOR SHALL COORDINATE WITH OWNER TO VERIFY FINAL MOUNTING HEIGHT REQUIREMENTS TO ENSURE SUFFICIENT HEAD CLEARANCE ON WALKWAY BELOW ELEVATED CONDUIT.

(6) RCP-1 STARTER LOCATED IN ADMINISTRATION BUILDING MECHANICAL ROOM. REFER TO SHEET E-9 FOR STARTER LOCATION AND ADDITIONAL WIRING REQUIREMENTS. REFER TO SHEET E-6 FOR RCP-1 STARTER SCHEMATIC.

DEMARCATION OF HEAT TRACING OF PROTECTED WATER LINES. REFER TO SHEET E-10 AND E-11 FOR ADDITIONAL REQUIREMENTS.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER
SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

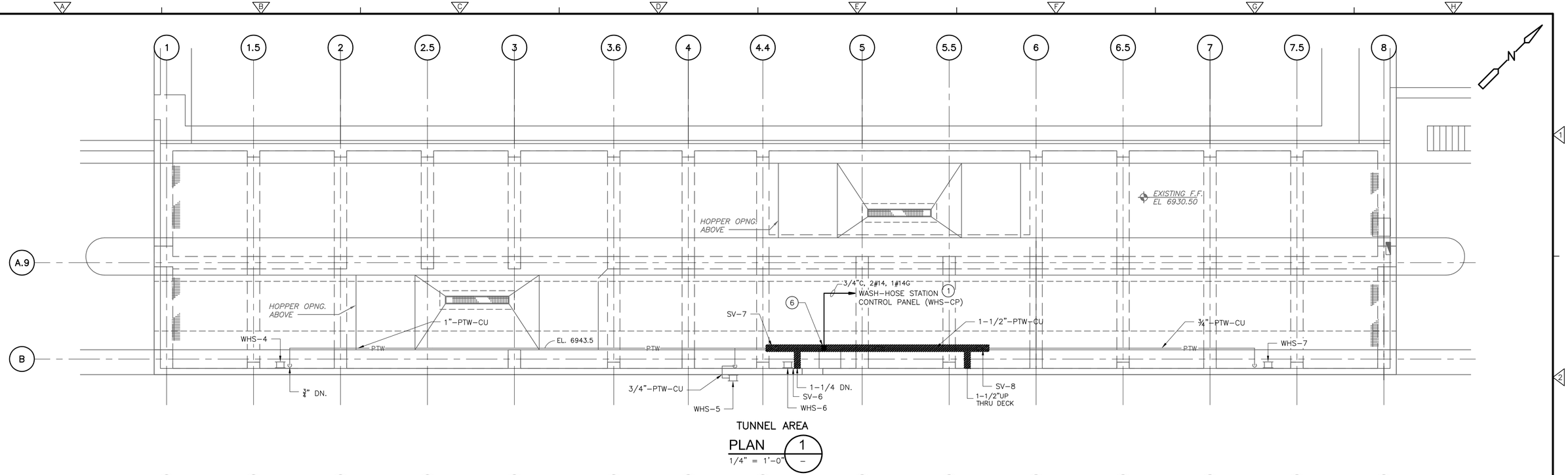
CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

TIPPING BUILDING
ELECTRICAL POWER PLAN I

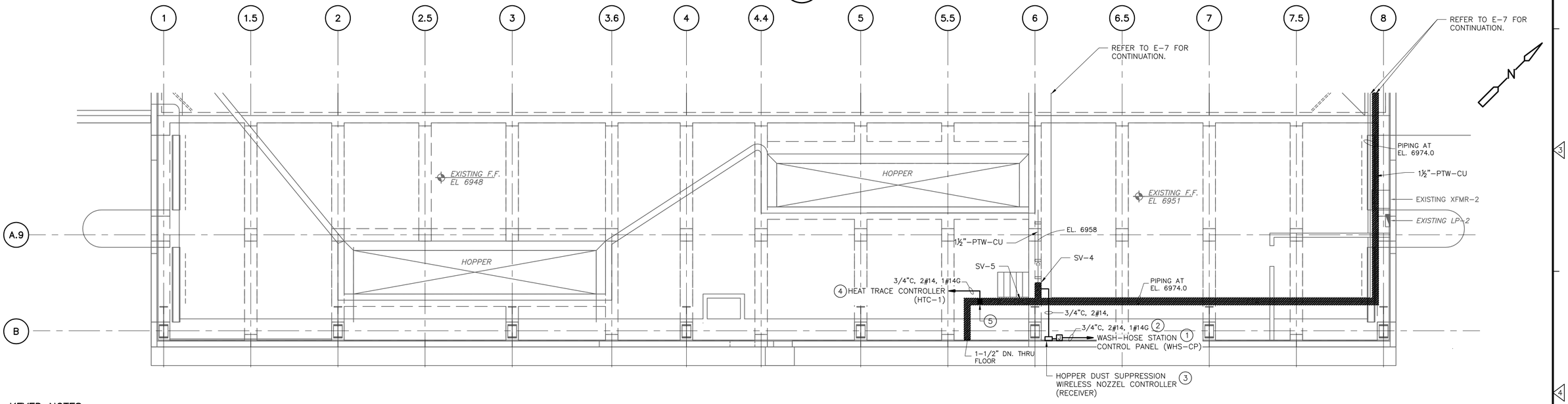
PROJECT NO. 116059-214241
FILE NAME: E007TFEL.DWG
SHEET NO.
E-7

ISSUED FOR CONSTRUCTION



TUNNEL AREA

PLAN 1 / – (1/4" = 1'-0")



HOPPER AREA

PLAN 2 / – (1/4" = 1'-0")

KEYED NOTES:

1. WASH-HOSE STATION CONTROL PANEL (WHS-CP) LOCATED IN ADMINISTRATION BUILDING ELECTRICAL ROOM. REFER TO SHEET E-9 FOR LOCATION.
2. SOLENOID VALVE (SV-4) WIRELESS CONTROLLER/TRANSMITTER REQUIRES 24V DC INPUT POWER SUPPLIED FROM 24V DC POWER SUPPLY LOCATED IN WASH-HOSE STATION CONTROL PANEL. REFER TO KEYED NOTE 1 FOR CONTROL PANEL LOCATION.
3. REFER TO DIAGRAM 3 ON SHEET E-6 FOR HOPPER DUST SUPPRESSION WIRELESS NOZZEL CONTROLLER (RECEIVER) AND SOLENOID VALVE (SV-4) WIRING REQUIREMENTS.
4. HEAT TRACE CONTROLLER (HTC-1) LOCATED IN ADMINISTRATION BUILDING ELECTRICAL ROOM. REFER TO SHEET E-9 FOR LOCATION.
5. HEAT TRACE TEMPERATURE SENSOR. PROVIDE CHROMALOX MODEL# RBF OR APPROVED EQUAL.
6. WASH-HOSE STATION CONTROL PANEL FREEZESTAT. PROVIDE JOHNSON CONTROLS (PENN) MODEL#: A19AAD-SC OR APPROVED EQUAL.

DEMARCATION OF HEAT TRACING OF PROTECTED WATER LINES. REFER TO SHEET E-10 AND E-11 FOR ADDITIONAL REQUIREMENTS.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER
SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

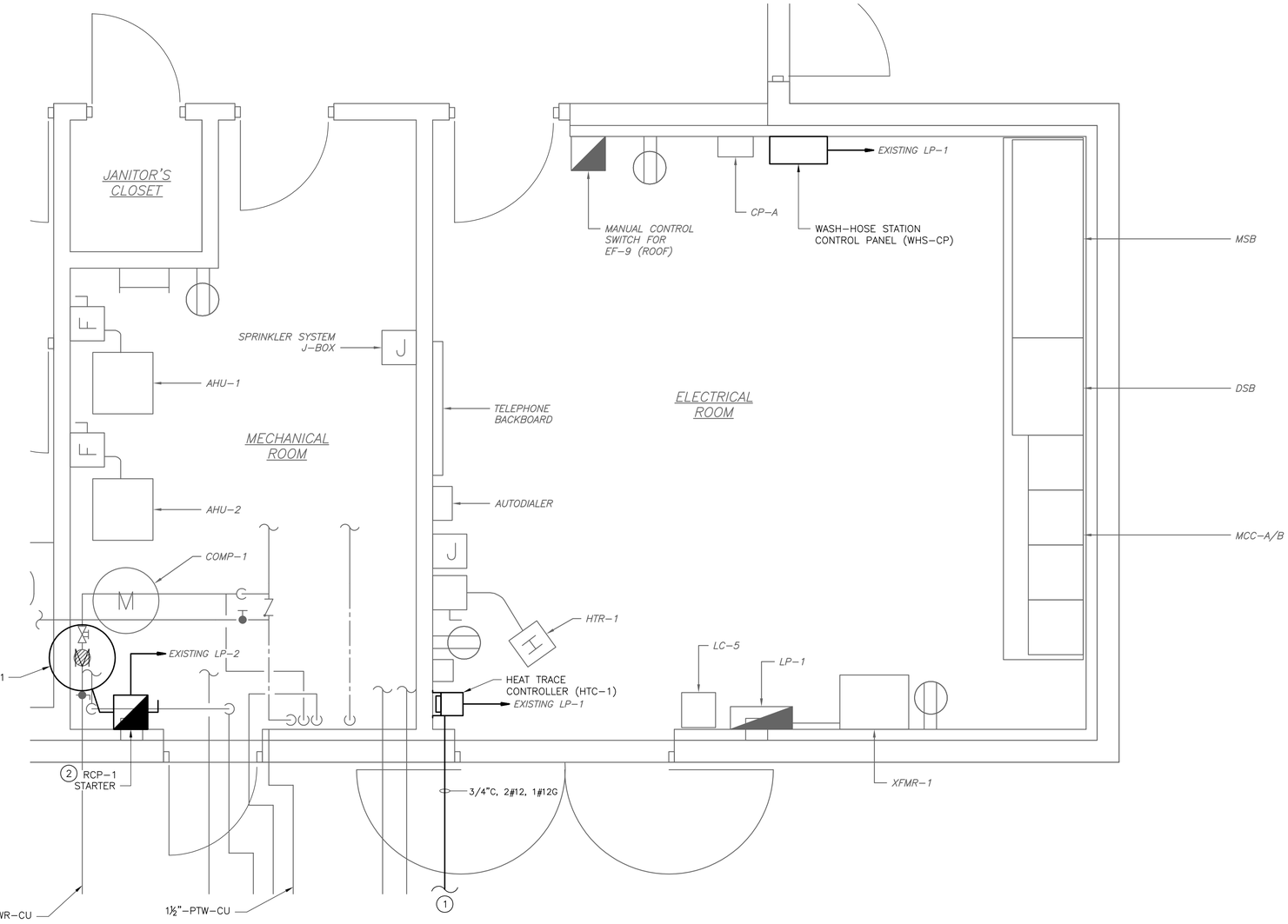
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

TIPPING BUILDING
ELECTRICAL POWER PLAN II

PROJECT NO. 116059-214241
FILE NAME: E0081FELDWG

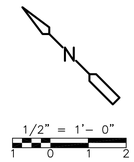
SHEET NO.
E-8

ISSUED FOR CONSTRUCTION



ADMINISTRATION BUILDING – ELECTRICAL ROOM ENLARGED PLAN

1/2" = 1'–0"



GENERAL NOTES:

1. REFER TO ELECTRICAL SINGLE–LINE DIAGRAM ON SHEET E–3 AND ELECTRICAL SCHEDULES ON SHEET E–5 FOR CONDUIT AND WIRE REQUIREMENTS.

KEYED NOTES:

(1) REFER TO SHEET E–7 FOR CONTINUATION. MOUNTING HEIGHT OF CONDUIT BETWEEN TIPPING AND ADMINISTRATION BUILDINGS SHALL BE 9'–0" A.F.G. MINIMUM. CONTRACTOR SHALL COORDINATE WITH OWNER TO VERIFY FINAL MOUNTING HEIGHT REQUIREMENTS TO ENSURE SUFFICIENT HEAD CLEARANCE ON WALKWAY BELOW ELEVATED CONDUIT.

(2) REFER TO SHEET E–6 FOR STARTER SCHEMATIC.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER
SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

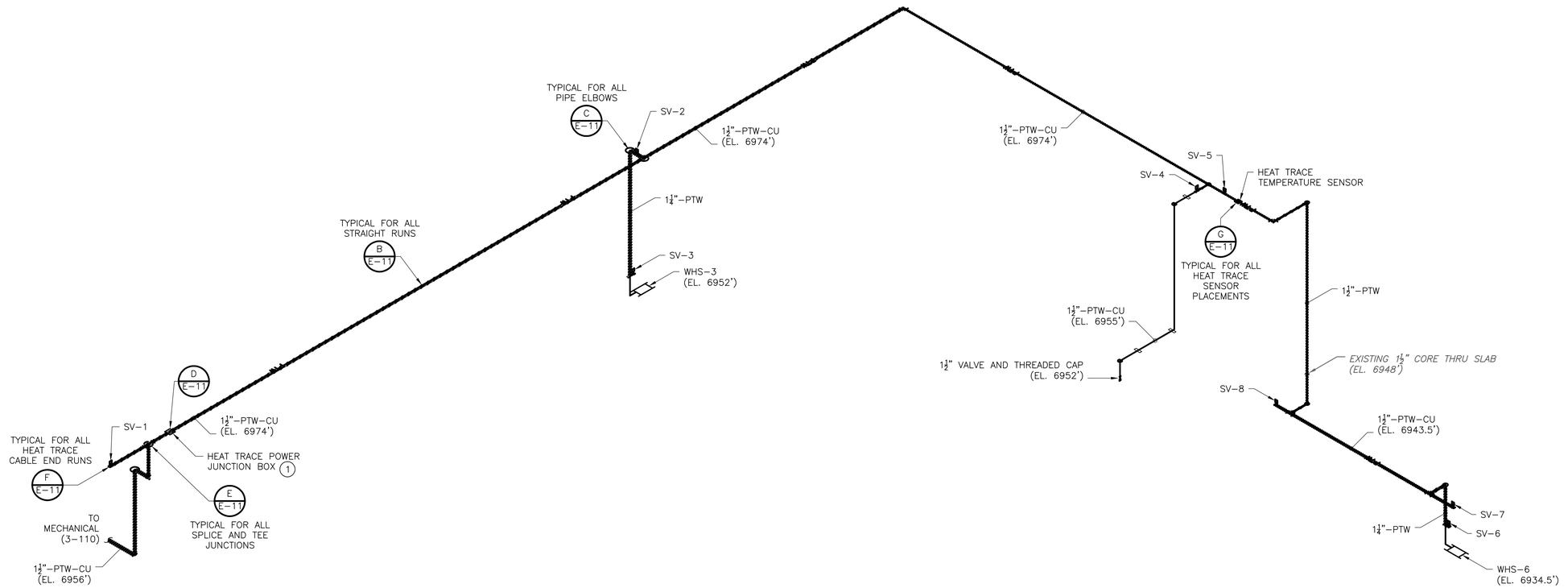
CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ADMINISTRATION BUILDING
ELECTRICAL ROOM ENLARGED PLAN

PROJECT NO. 116059–214241
FILE NAME: E009ADEL.DWG
SHEET NO.
E-9

ISSUED FOR CONSTRUCTION



TIPPING BUILDING – HEAT TRACE ISOMETRIC

PLAN

N.T.S.

N

KEYED NOTES:

1. REFER TO SHEETS E-7 AND E-9 FOR ADDITIONAL REQUIREMENTS.

DEMARCATION OF HEAT TRACING OF PROTECTED WATER LINES.

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER

SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

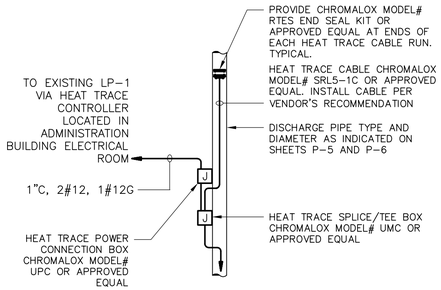
BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

TIPPING BUILDING HEAT TRACE ISOMETRIC PLAN

PROJECT NO. 116059-214241
FILE NAME: E010MISC.DWG

SHEET NO.
E-10

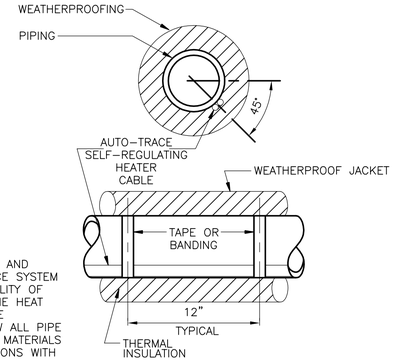
ISSUED FOR CONSTRUCTION



HEAT TRACE CONNECTION WIRING

DETAIL A

NTS



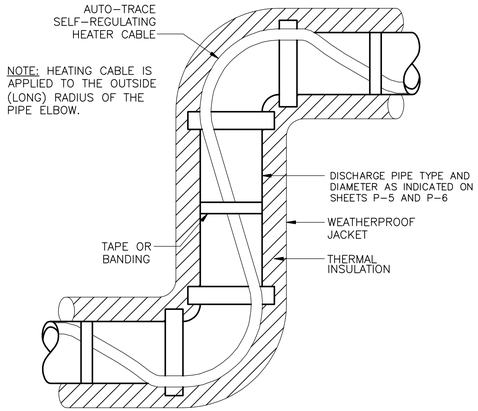
DETAIL B NOTES:

1. THE FINAL SYSTEM LAYOUT AND DESIGN OF THE HEAT TRACE SYSTEM SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND THE HEAT TRACE MANUFACTURER. THE CONTRACTOR SHALL REVIEW ALL PIPE LENGTHS AND SIZES, PIPE MATERIALS AND HEAT LOSS CALCULATIONS WITH THE MANUFACTURER. THE MANUFACTURER SHALL THEN RECOMMEND THE QUANTITIES, WATTAGES AND CABLE PRODUCT REQUIRED FOR EACH APPLICATION.
2. REFER TO THE PLUMBING SHEETS P-5 AND P-6 FOR PIPE LOCATIONS AND LENGTHS. ALL FITTINGS AND INSTRUMENTS SHALL BE INCLUDED IN THE SCOPE OF THE WORK.
3. PROVIDE 1"C, 2#12, 1#12G TO HEAT TRACE CONTROLLER FROM EXISTING PANELBOARD LP-1, CKT#28,30 LOCATED IN ELECTRICAL ROOM OF THE ADMINISTRATION BUILDING. PROVIDE NEMA 4X, CHROMALOX MODEL# ITC2 DIGITAL HEAT TRACE CONTROLLER OR APPROVED EQUAL, PROVIDE CHROMALOX MODEL# RTES HEAT TRACE CABLE END SEAL KIT(S) OR APPROVED EQUAL, PROVIDE CHROMALOX MODEL# SLR5-1C SELF REGULATING HEAT TRACE CABLE OR APPROVED EQUAL AND ALL ACCESSORIES REQUIRED TO PREVENT PIPING FROM FREEZING.
4. SEE SHEET P-5 AND P-6 FOR ADDITIONAL DETAILS.

HEAT TRACE STRAIGHT RUN PIPE ROUTING

DETAIL B

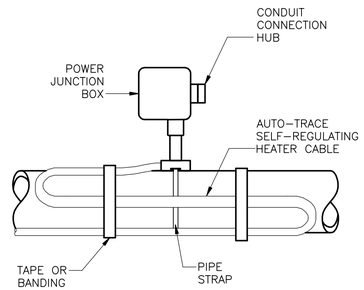
N.T.S.



HEAT TRACE PIPE ELBOW ROUTING

DETAIL C

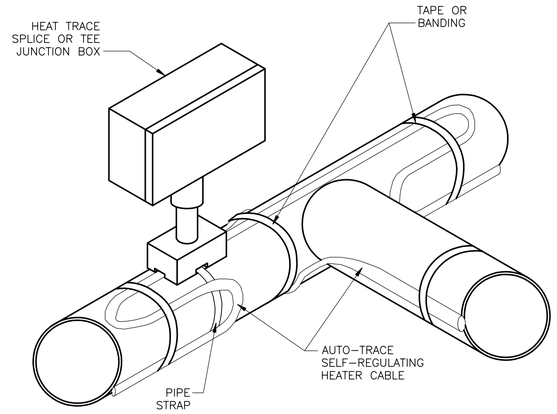
N.T.S.



HEAT TRACE POWER CONNECTION AND ROUTING

DETAIL D

N.T.S.

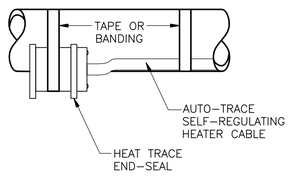


NOTE: ALL PIPING MUST BE FULLY INSULATED AND WEATHERSEALED.

HEAT TRACE SPLICE OR TEE ROUTING

DETAIL E

N.T.S.

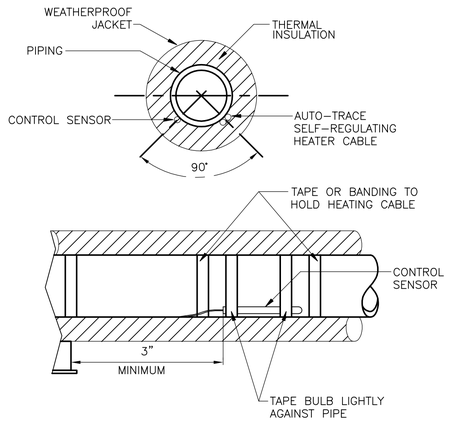


NOTE: ALL PIPING MUST BE FULLY INSULATED AND WEATHERSEALED.

HEAT TRACE END-SEAL ROUTING

DETAIL F

N.T.S.



HEAT TRACE SENSOR PLACEMENT

DETAIL G

N.T.S.

NOTE:

1. FOR MULTIPLE HEATERS PLACE CONTROL SENSOR 90° FROM NEAREST HEATER OR CENTERED BETWEEN EQUALLY SPACED HEATERS.
2. PLACE HIGH-LIMIT SENSOR APPROXIMATELY 15" FROM HEATER AND MOUNT IN THE SAME MANNER AS SHOWN ABOVE.

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BRADLEY J. FRANSEN NEW MEXICO 23658 PROFESSIONAL ENGINEER

SIGNED: 05/08/2017

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: T. ADAMS
DRAWN BY: T. ADAMS
SHEET CHK'D BY: T. NGUYEN
CROSS CHK'D BY: B. FRANSEN
APPROVED BY: G. LARSON
DATE: APRIL 2017

CDM Smith
6001 Indian School Road NE, Suite 310
Albuquerque, NM 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

BUCKMAN ROAD RECYCLING & TRANSFER STATION
WATER LINE AND MISTING SYSTEM IMPROVEMENTS

ELECTRICAL DETAILS

PROJECT NO. 116059-214241
FILE NAME: E011DETL.DWG

SHEET NO.
E-11

ISSUED FOR CONSTRUCTION