

INVITATION FOR BIDS



FOR CONSTRUCTING

ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE PROTECTION

CONTRACT NUMBER
C02012

ISSUED BY
CAPITAL PROJECTS ENGINEERING DIVISION
CITY OF SANTA ROSA, CALIFORNIA

2018

ATTENTION
Prebid Conference
See Page 1



STATE OF CALIFORNIA

INVITATION FOR BIDS

CONTAINING:

NOTICE TO BIDDERS

SPECIAL PROVISIONS

BID FORMS

CONTRACT

FOR

**ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE
SPRINKLER SYSTEM FREEZE PROTECTION**

Contract No. C02012

ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE PROTECTION

TABLE OF CONTENTS

NOTICE TO BIDDERS

NOTICE TO BIDDERS	1
-------------------------	---

SPECIAL PROVISIONS

GENERAL SPECIFICATIONS

1 General.....	4
2 Bidding.....	6
3 Contract Award and Execution.....	9
4 Scope of Work	13
5 Control of Work	14
6 Control of Materials.....	18
7 Legal Relations and Responsibility to the Public	21
8 Prosecution and Progress.....	25
9 Measurement and Payment	26

TECHNICAL SPECIFICATIONS30

Section 13	Water Pollution Control	31
Section 14	Environmental Stewardship	33
Section 15	Existing Facilities	35
Section 19	Earthwork	37
Section 39	Hot Mix Asphalt.....	39
Section 39A	Asphalt Concrete Trench Paving.....	45
Section 90	Concrete.....	47
Section 124	Material Recycling	48
Section A	Fees and Permits.....	49

TECHNICAL SPECIFICATIONS KENNEDY/JENKS.....50

Section 01010	Summary of Work	51
Section 01040	Coordination and Project Requirements.....	57
Section 01300	Submittals.....	66
Section 01500	Construction Facilities and Temporary Controls.....	72
Section 01650	Facility Startup	75
Section 01700	Contract Closeout	78
Section 15082	Piping Insulation	81
Section 16010	General Electrical Requirements	88
Section 16110	Conduit, Raceway, & Fittings	97
Section 16120	Low Voltage Wire and Cable	103
Section 16130	Boxes	108
Section 16402	Underground Electrical Work.....	110
Section 16850	Electric Heat Tracing.....	112

BID FORMS

Contract Bid	114
Unit Price Schedule	115
List of Subcontractors	117
List of Previous Similar Jobs	118
Noncollusion Declaration	119
Bid Bond Affidavit and Bidder's Signature	120

CONTRACT

Contract	121
----------------	-----

CITY OF SANTA ROSA
STATE OF CALIFORNIA

NOTICE TO BIDDERS

➤	For technical questions regarding this project, contact Bryan Heinzelman at (707) 543-3812.
➤	For direct access to plans, specifications and planholders' lists, go to www.srcity.org/bids and click on <u>Bid/Proposal Opportunities</u> or call (707) 543-3800.
➤	For direct access to bid results, go to www.srcity.org/bids . Under Link to Capital Projects, click on <u>Capital Projects Contracts</u> or call (707) 543-3835.

- IMPORTANT -

Bid Acceptance Deadline

Sealed bids will be accepted at the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California 95401 until 2:00 p.m., March 28, 2018, for Alpha Farm Biosolids Storage Facility Fire Sprinkler System Freeze Protection, Contract No. C02012. (Engineer's Estimate: \$41,000.)

Bids tendered after this deadline will not be accepted. The official time clock for accepting bids will be an electric date and time stamping clock, located in the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California. In order to be accepted, bids must be received prior to 2:00 p.m. Therefore, a bid stamped in at 1:59 p.m. will be accepted, but one delivered at or after 2:00 p.m. is late and will not be accepted.

Mandatory Pre-Bid Meeting Site Visit

Prospective bidders, subcontractors, and material suppliers are required to attend one of two mandatory pre-bid site visits scheduled to be held at 10:00 a.m., March 20, 2018, and March 22, 2018, located at the project site, 3000 Llano Road, Santa Rosa, California. Bids will not be accepted from any bidder who has not attended one of two site visits.

Subcontractor Information; Department of Industrial Relations Registration

Bidders shall provide the names, business addresses and license numbers of all subcontractors listed on bidder's List of Subcontractors. No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

CITY OF SANTA ROSA ESTIMATED QUANTITIES
ESTIMATED QUANTITIES
ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE PROTECTION

Item No.	Description	QUANTITY	Units
1	ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE PROTECTION	1	LS

The foregoing quantities are approximate only, being given as a basis for the comparison of bids, and the City of Santa Rosa does not expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, as may be deemed necessary or expedient by the Engineer.

Bids shall be made in accordance with the prevailing hourly rate of per diem wages for this locality and project as determined by the Director of the DIR pursuant to Labor Code sections 1770 *et seq.*

Contractor shall be responsible for compliance with the Immigration Reform Control Act of 1986.

If the project requires the employment of workers in any apprenticeable craft or trade, once awarded, Contractor and subcontractors must apply to the Joint Apprenticeship Council unless already covered by local apprentice standards (see Labor Code section 1777.5).

All bids are to be compared on the basis of the Engineer's estimate of the quantities of work to be performed. No bid will be awarded to a contractor who is not licensed in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code. Contractor must hold a Class A or C10 license for this project.

Project plans, bid and contract forms for Alpha Farm Biosolids Storage Facility Fire Sprinkler System Freeze Protection may be obtained through PlanetBids at www.srcity.org/bids. These documents can no longer be obtained at the Transportation and Public Works Department.

No bid will be accepted unless it is made on the contract bid forms furnished by the Transportation and Public Works Department through PlanetBids. The original of the completed bid forms bearing original signatures must be submitted. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at www.srcity.org/bids, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

The successful bidder will be required to hold a current City of Santa Rosa business tax certificate issued pursuant to Chapter 6.04 of the Santa Rosa City Code before commencing work on this project. For information regarding the business tax, contact Revenue and Collections at (707) 543-3170.

For any moneys earned by Contractor and withheld by the City of Santa Rosa to ensure the performance of the Contract, Contractor may, at its request and expense, substitute securities equivalent to the amount withheld in the form and manner and subject to the conditions provided in Section 22300 of the California Public Contract Code.

The City of Santa Rosa reserves the right to reject any or all bids and the right to waive minor irregularities or informalities in any bid or bonds.

TRACY DUENAS
Supervising Engineer

Date

SPECIAL PROVISIONS

General Specifications

CITY OF SANTA ROSA, CALIFORNIA

ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SYSTEM FREEZE PROTECTION

1 GENERAL

The work described herein shall be done in accordance with the "Contract Documents," which are the:

1. Special Provisions
2. Project Plans, consisting of 5 sheets entitled Alpha Farm Biosolids Storage Facility Fire Sprinkler System Freeze Protection, 2016-0038
3. City of Santa Rosa Design and Construction Standards (City Standards)
4. City of Santa Rosa Construction Specifications for Public improvements (City Specifications)
5. State of California Department of Transportation Standard Specifications 2010 (Standard Specifications), and
6. State of California Department of Transportation Standard Plans 2010 (Standard Plans).

In the event of a conflict in any of these documents, the order of precedence shall be determined by Section 5-1.02 of these Special Provisions.

Whenever the Standard Specifications use the terms State of California, Department of Transportation, Director, Engineer, or Laboratory, the following terms shall be substituted therefor, and any reference to any of the foregoing terms shall be understood and interpreted to mean and refer to such substituted terms as follows:

For State of California - the City of Santa Rosa;

For Department - the City of Santa Rosa Department of Transportation and Public Works or the City of Santa Rosa Water Department;

For Director - the City Engineer of the City of Santa Rosa;

For Engineer - the City Engineer of the City of Santa Rosa or the City Engineer's authorized agents;

For Laboratory – Materials Engineering of the City of Santa Rosa Water Department, or such other laboratory as may be authorized by the City.

For Owner – the City Engineer of the City of Santa Rosa

Unless otherwise provided, whenever in these Special Provisions attention is directed to specific provisions in the Standard Specifications, such direction shall not be interpreted as excluding other applicable provisions of the Standard Specifications.

Unless otherwise provided, when sections and subsections of the Standard Specifications are used in these Special Provisions, such use is not exclusive and shall not be interpreted as excluding other applicable provisions of said sections and subsections, but is only intended to add to or modify such sections or subsections.

Unless otherwise provided, full compensation for compliance with these Special Provisions is included in the contract price and no additional allowance will be made to Contractor therefor. The Standard Specifications are hereby modified to delete any reference or incorporation of provisions providing for or requiring arbitration of any and all claims and disputes arising under this contract.

2 BIDDING

2-1.06 Bid Documents: Prospective bidders will be furnished with an Invitation for Bids which will state the location and description of the contemplated public works project and will show the approximate estimate of the various quantities and kinds of work to be performed and materials to be furnished with a schedule of items for which unit prices are requested.

2-1.07 Approximate Estimate: The quantities given in the Contract Documents are approximate only, being given as a basis for the comparison of bids, and the City does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or part of the work or to omit parts of the work, as may be deemed necessary or advisable by the Engineer.

2-1.31 Examination of Project Plans, Specifications, City Standards, Invitation for Bids and Work Site: Prior to submitting a bid, the bidder shall carefully examine the Project Plans, Invitation for Bids, City Standards and the proposed work site. If any person contemplating submitting a bid for this public works project is in doubt as to the meaning of any part of the Contract Documents, or finds discrepancies in or omissions from the Contract Documents, he or she may submit a written request for interpretation or correction to the Engineer. The written request must be received by the Engineer a minimum of 96 hours prior to bid opening. Any interpretation or correction of the Contract Documents prior to bid opening will be made only by written addendum issued by the City. Notification of addenda will be handled through PlanetBids: the listed primary contact will receive an e-mail generated by PlanetBids informing them of a recently uploaded addendum. The City will not be bound by any other explanations or interpretations of the Contract Documents.

2-1.33 Bid Document Completion: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

2-1.33A Bid Forms: All bids shall be made on bid forms obtained from PlanetBids at www.srcity.org/bids. The bidder shall submit its bid on the original bid forms furnished by the City. Bids submitted on forms other than the forms furnished to the bidder by the City will not be considered.

The bid forms to be submitted at the time of and with the bid are:

1. Unit Price Schedule
2. List of Subcontractors
3. List of Previous Similar Jobs
4. Noncollusion Declaration
5. Bid Guaranty Information and Bidder's Information and Signature
6. Bid Guaranty (Bid Bond or alternate security)

All bids shall give the proposed prices and must bear the original signature of the bidder. Bidders shall fill in all blanks on the bid forms where required. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at www.srcity.org/bids, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

2-1.33B Registration with DIR: No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this

public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

2-1.33C Subcontractors: The Subletting and Subcontracting Fair Practices Act, Public Contract Code sections 4100-4113, inclusive (the "Act") shall apply to all subcontracts in excess of one-half of one percent of the total amount of a bid. The Act requires subcontractors, if used for such work, to be listed in the contractor's bid and prohibits the substitution of subcontractors, except as authorized by the Act. Each bidder shall, with respect to the work of any subcontractor in excess of one-half of one percent of the total amount of the bid, include as part of the bid on the bid form provided:

1. The name, business address and DIR registration number of each subcontractor who will perform work or labor or render services to the Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the Project Plans or other Contract Documents in an amount in excess of one-half of one percent of the Contractor's total bid; and
2. The portion of the work that will be done by each subcontractor. Only one subcontractor shall be listed for each portion.

The purchase of sand, gravel, crushed rock, batched concrete, aggregate, ready-mixed concrete, and/or any other materials produced and furnished by established and recognized commercial plants, together with the delivery of such materials to the work site by the source of the materials or by recognized commercial hauling companies, is not considered as subcontracting under this section.

2-1.33E Rejection of Bids Containing Alterations, Erasures or Irregularities: Bids may be rejected if they show any alterations of forms, additions not called for, conditional bids, incomplete bids, erasures or irregularities of any kind.

2-1.34 Bid Guaranty: All bids shall be presented under sealed cover and shall be accompanied by cash, cashier's or certified check, or by a bidder's bond made payable to the City of Santa Rosa and executed as surety by a corporate surety authorized and admitted to transact a surety business in the State of California in an amount equal to ten percent of the amount of the bid. No bid shall be considered unless such cash, cashier's or certified check, or bidder's bond is enclosed with the bid. Any bidder's bond shall contain provisions for forfeiture consistent with California Public Contract Code section 20172.

2-1.40 Withdrawal of Bid: A bid may be withdrawn prior to, but not after, the hour fixed in the public notice for the opening of bids, provided that a written request to withdraw the bid, executed by the bidder or the bidder's authorized representative, is filed with the Engineer before this deadline. The withdrawal of a bid shall not prejudice the right of a bidder to submit a new bid.

2-1.43 Public Opening of Bids: Bids will be opened and read publicly at the time and place indicated in the Notice to Bidders. Bidders or their authorized agents are invited to be present.

2-1.46 Disqualification of Bidders: Serial bids from the same bidder will not be accepted. This section shall not be interpreted to mean that the same contractor may not be the contractor in one bid and listed as a subcontractor in another bid, provided that no collusion exists.

2-1.48 Competency of Bidders: No bid will be accepted from or contract awarded to a contractor that is not licensed in accordance with the law, that does not hold a license qualifying it to perform work under this contract, to whom a bid form has not been issued by the Engineer, or that has not

successfully completed projects of similar character, scope and cost to the proposed project. Bidders will be required to provide a list of previous similar jobs with their bids.

3 CONTRACT AWARD AND EXECUTION

3-1.04 Contract Award: The City reserves the right to reject any or all bids. Bids are required for the entire work described herein. All bids will be compared with the Engineer's estimate of the quantities of work to be completed. Contract award, if any, will be made to the lowest responsible bidder within sixty days from the date bids are opened.

3-1.05 Contract Bonds:

The successful bidder will NOT be required to furnish a performance bond or material guaranty bond for this project. In the event that the contract award exceeds \$25,000.00, the successful bidder will be required to provide a payment bond for labor and materials within ten days after receipt of the Notice of Award in accordance with California Civil Code section 9550, executed in a sum of 100% of the Contract price. **A BID BOND IS REQUIRED. REFER TO SECTION 2-1.34 OF THESE SPECIAL PROVISIONS.**

The bond(s) shall be provided in a form acceptable to the City and issued by a corporate surety in good financial standing and authorized and admitted to transact a surety business in the state of California for the purposes and in the amount(s) stated above.

Whenever the financial or legal status of any surety on any such bond(s) is/are unacceptable to the City, it may make a demand to Contractor for further bond(s) or additional surety, not exceeding the sums originally required. Thereafter, no payment shall be made upon the Contract to Contractor or any assignees of Contractor until such bond(s) or additional surety has/have been provided to the City.

3-1.07 Indemnification and Insurance: Indemnification: Contractor shall defend, hold harmless and indemnify City, its officers, agents and employees, and each and every one of them, from and against any and all actions, damages, costs, liabilities, claims, demands, losses, judgments, penalties, costs and expenses of every type and description, including, but not limited to, any fees and/or costs reasonably incurred by City's staff attorneys or outside attorneys and any fees and expenses incurred in enforcing this provision (hereafter collectively referred to as "Liabilities"), including but not limited to Liabilities arising from personal injury or death; damage to personal, real or intellectual property or the environment; contractual or other economic damages, or regulatory penalties, arising out of or in any way connected with the performance of or the failure to perform the Contract by Contractor, any subcontractor or agent, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, whether or not such Liabilities are caused in part by a party indemnified hereunder, or such Liabilities are litigated, settled or reduced to judgment; provided, that the foregoing indemnity does not apply to liability for any damage or expense for death or bodily injury to persons or damage to property to the extent arising from (i) the sole negligence, or willful misconduct of, or defects in design furnished by City, its agents, servants, or independent contractors who are directly responsible to City (excluding Contractor), or (ii) the active negligence of City.

The existence of any of the insurance policies or coverages described in this Contract shall not affect or limit any of City's rights hereunder, nor shall the limits of such insurance limit Contractor's liability to the City hereunder. The provisions of this section shall survive any expiration or termination of the Contract.

Insurance: Contractor shall maintain in full force and effect all of the insurance coverage described in and in accordance with the insurance requirements set forth below. Maintenance of such insurance coverage during the entire performance of the Contract is a material element of the Contract. Failure by Contractor to (i) maintain or renew coverage, (ii) provide notice of any changes, modifications, or reductions in coverage, or (iii) provide evidence of renewal, if

necessary, may be deemed a material breach of the Contract by Contractor, whereas the City shall be entitled to all rights and remedies at law or in equity. Notwithstanding the foregoing, any failure by Contractor to maintain required insurance coverage shall not excuse or alleviate Contractor from any of its other duties or obligations under the Contract. In the event Contractor retains or utilizes any subcontractors or sub-consultants in performance of the work, Contractor shall assure that any such subcontractor has first obtained, and shall maintain, all of the insurance coverage requirements herein set forth below.

Insurance Requirements:

- A. Insurance Policies:** Contractor shall maintain and keep in full force and effect, the following policies of insurance with minimum coverage as indicated below and issued by insurers with an AM Best rating of no less than A-:VI or a rating otherwise acceptable to the City.

	Insurance	Minimum Coverage Limits	Additional Coverage Requirements
1.	Commercial general liability	\$ 3 million per occurrence \$ 3 million aggregate	Coverage must be at least as broad as ISO CG 00 01 and must include products liability and completed operations coverage which shall continue for a period of 365 days after acceptance of the work by the City. If insurance applies separately to a project/location, aggregate may be equal to per occurrence amount. Coverage may be met by a combination of primary and umbrella or excess insurance but umbrella and excess shall provide coverage at least as broad as specified for underlying coverage. Coverage can be provided in the form of an endorsement to Contractor's insurance (at least as broad as ISO Form CG 20 10, 11 85 or both CG 20 10 and CG 23 37 forms if later revisions used). Coverage shall not exclude subsidence.
2.	Business auto coverage	\$ 1 million	ISO Form Number CA 00 01 covering any auto (Code 1). Insurance shall cover owned, non-owned and hired autos.
3.	Workers' compensation and Employer's Liability	\$ 1 million	As required by the State of California, with Statutory Limits and Employer's Liability Insurance with limit of no less than \$1 million per accident for bodily injury or disease. The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the City for all work performed by the Contractor, its employees, agents and subcontractors.

B. Endorsements:

1. All policies shall provide or be endorsed to provide that coverage shall not be canceled by either party, except after prior written notice has been provided to the City in

accordance with the policy provisions.

2. Liability policies shall provide or be endorsed to provide the following:
 - a. For any claims related to this Contract, Contractor's insurance coverage shall be primary and any insurance or self-insurance maintained by City shall be in excess of Contractor's insurance and shall not contribute with it. Endorsements at least as broad as 20 01 04 13 or evidence of policy language will be required in non ISO CGL policies.
 - b. The City of Santa Rosa, its officers, agents and employees are to be covered as additional insureds on the CGL policy. Additional Insured Endorsements at least as broad as 20 10 04 13 or 20 38 04 13 are required.

C. Verification of Coverage and Certificates of Insurance: Contractor shall furnish City with original certificates and endorsements effecting coverage required above. Certificates and endorsements shall make reference to policy numbers. All certificates and endorsements are to be received and approved by the City before work commences and must be in effect for the duration of the Contract. The City reserves the right to require complete copies of all required policies and endorsements during the duration of the Contract and for a period of 365 days following City's acceptance of the work.

D. Other Insurance Provisions:

1. No policy required by this Contract shall prohibit Contractor from waiving any right of recovery prior to loss. Contractor hereby waives such right with regard to the indemnitees.
2. All insurance coverage amounts provided by Contractor and available or applicable to this Agreement are intended to apply to the full extent of the policies. Nothing contained in this Agreement limits the application of such insurance coverage. Coverage for an additional insured shall NOT be limited to the insured's vicarious liability. Defense costs must be paid in addition to coverage amounts.
3. Self-insured retentions above \$10,000 must be approved by the City. At the City's option, Contractor may be required to provide financial guarantees.
4. City reserves the right to modify these insurance requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

3-1.18 Contract Execution: The fully executed Contract, original bonds and insurance certificates and endorsements required under the Contract shall be delivered to the City within ten calendar days of Contractor's receipt of the Notice of Award.

The Engineer will supply Contractor with up to ten sets of the Invitation for Bids and Project Plans. At least one complete set of the Invitation for Bids and Project Plans shall be kept at the construction site in good condition and made available to the Engineer at all times. Additional copies of the Invitation for Bids and Project Plans will be provided by the Engineer at Contractor's cost.

3-1.20 Failure to Execute Contract: Contractor's failure to deliver to the City the fully executed Contract within ten calendar days of Contractor's receipt of the Notice of Award shall be cause for the cancellation of the award and the forfeiture of the bid guaranty to the City. If the successful bidder refuses or fails to execute the Contract, the City may award the Contract to the second lowest responsible bidder. If the second lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the third lowest responsible bidder. The refusal or failure by the second or third lowest responsible bidder to deliver to the City the fully executed Contract within ten calendar days of receipt of the Notice of Award to the respective bidder shall likewise be cause for the cancellation of the award and the forfeiture of the bid guaranty of the

respective bidder. In its discretion, the City may then re-advertise the project or construct it by day labor.

3-1.21 Return of Bid Guarantees: Within ten days after the opening of bids, the City will return the bid guarantees to all bidders except the three lowest responsible bidders. The bid guarantees of the three lowest responsible bidders will be retained until the Contract has been fully executed. In the event all bids are rejected, all bid guarantees will be returned to the respective bidders.

3-1.22 Subcontractors: The successful bidder shall furnish a list of all subcontractors as required under Sections 2-1.33C. The list shall include the name, business address, DIR registration number and the state contractor's license number of each subcontractor on the list and the names of the responsible managing employees whose names appear on the subcontractors' licenses.

4 SCOPE OF WORK

4-1.05 Changes and Extra Work: All changes to the Contract shall be made by written change order only.

All extra work shall be recorded by Contractor on a daily report signed by both the City and Contractor. The “daily reports” shall thereafter be considered the true record of extra work performed. A copy of the daily reports will be furnished to Contractor. Contractor is directed to Section 9-1.04 of this Invitation for Bids.

4-1.05C Compensation for Altered Quantities: Payment and compensation for altered quantities shall conform to the provisions of Section 9-1.06 of the Standard Specifications, except as modified herein.

5 CONTROL OF WORK

5-1.02 Contractor's Copies of Contract Documents: In the event of a conflict in any of the Contract Documents, the order of precedence from highest to lowest shall be as follows:

1. Special Provisions
2. Project Plans, consisting of 5 sheets entitled Alpha Farm Biosolids Storage Facility
Fire Sprinkler System Freeze Protection, 2016-0038
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

5-1.05 Order of Work: The work as shown on the Project Plans and as specified in the Invitation for Bids shall be constructed in a sequence that is satisfactory to and approved by the Engineer.

Contractor shall prepare a work schedule per Section 8-1.02 of the Standard Specifications.

Work shall be sequenced per Section 8-1.05.

Full compensation for the conformance to the requirements of this section is included in the Contract price and no additional allowance will be made to Contractor for this work.

5-1.17 Character of Workers: Contractor is directed to Section 5-1.17 of the Standard Specifications which states:

"If any subcontractor or person employed by the Contractor shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the request of the Engineer, and such person shall not again be employed on the work."

No additional compensation shall be granted to Contractor in the event City exercises any part of its rights under this section and any and all costs related to such exercise shall be borne by Contractor.

5-1.20 Cooperation with Other Entities: Attention is directed to Section 5-1.20 of the Standard Specifications.

Other construction including but not limited to utility, power, and pipe line relocation, may be in progress by other forces within and adjacent to the project area at the same time work is being performed under this Contract by Contractor.

Contractor shall cooperate with the forces performing other work, to the end that such forces may conduct their operations with as little inconvenience and delay as possible. Contractor shall grant such forces access to the project area as is reasonable and necessary to transport materials and equipment to the site of operations by the other forces.

5-1.20B(4)(a) Offsite Staging Areas and Construction Yards: Attention is directed to Santa Rosa City Code section 20-52.040, Temporary Use Permit.

A Temporary Use Permit shall be obtained for any offsite construction yard on private property to be used for any of the following:

- a. Stockpiling of equipment and/or materials;

- b. Staging of construction;
- c. Placement of work trailers or mobile offices;
- d. Storage of trench spoils; or
- e. Other construction related activities not specifically enumerated above.

5-1.26 Lines and Grades: Contractor shall carefully preserve all bench marks, grade stakes, and all other survey markers. In the case of willful or careless destruction, Contractor shall bear the cost of replacing the markers.

Contractor shall contact the Engineer directly for coordination of survey staking. Written staking requests must be submitted at least two working days in advance of the date and time stakes are needed.

5-1.27B Examination and Audit: Pursuant to California Government Code section 8546.7, any contract with the City involving expenditures in excess of \$10,000 shall be subject to the examination and audit of the California State Auditor for a period of three years after final payment is made to Contractor by City under this Contract. Any such examination and audit will be confined to those matters connected with the performance of this Contract.

5-1.30A Inspection: Contractor shall bear all costs associated with the re-inspection of any defective, rejected or unauthorized work as determined by the Engineer in Engineer's sole discretion. Such costs of re-inspection, including any costs incurred by the City for additional staff time or fees for third-party consultant inspectors, will be deducted from one or more progress payments hereunder.

5-1.36A Property and Facility Preservation: Attention is directed to Section 5-1.36 of the Standard Specifications.

At Contractor's sole expense, all fences, gates, landscaping, drainage ditches, sidewalks, irrigation systems, and any other improvements that are damaged, removed or destroyed because of Contractor's operations, shall be replaced in accordance with City Standards at a minimum and restored to the same or better condition. Concrete surface treatment and score marks shall match adjacent existing concrete improvements.

5-1.36E Obstructions: Attention is directed to Section 5-1.36 of the Standard Specifications and to the possible existence of underground gas mains, high voltage lines, telephone ducts, storm drains and water and sewers systems, the locations of which are not shown on the Project Plans. The determination of the location of these facilities and the cost of repair or replacement in the event of damage to such facilities are the sole responsibility of Contractor.

Should Contractor alter any public utility or private improvements to facilitate its operations or for its sole benefit, which alteration would not be otherwise required, Contractor shall make whatever arrangements are necessary with the owner or controlling authorities, and shall bear all expenses in connection therewith. Any damages to any public utility or private improvement caused by Contractor shall be repaired by Contractor at its sole expense and to the full satisfaction of the Engineer or the controlling authority.

Any subsurface information and data furnished under any part of this Contract are not intended as a representation or warranty but are furnished for information only. It is expressly understood that the City will not be responsible for the accuracy thereof or for any deduction, interpretation or conclusion drawn therefrom by Contractor. The information is made available so that Contractor may have ready access to the same information available to the City and is not part of this Contract.

PRIOR TO STARTING ANY EXCAVATION, CONTRACTOR SHALL (AT LEAST TWO WORKING DAYS IN ADVANCE) CALL UNDERGROUND SERVICE ALERT (USA) toll free at (800) 227-2600

and provide USA with all necessary data relative to the proposed excavation. USA will accept calls and process information to participating agencies who have underground facilities in the area between the hours of 7:30 a.m. and 5:00 p.m. daily, except Saturdays, Sundays, and holidays. Between the hours of 5:00 p.m. and 7:30 a.m., calls will be recorded and then processed after 7:30 a.m. For emergency situations, after hours, and on Saturdays, Sundays and holidays, Contractor shall contact the owner of the affected facility.

Contractor shall coordinate all work with the appropriate City field personnel. When City work forces are required at the job site to perform Contract items of work, Contractor shall give a minimum of two working days advanced notification to the appropriate field office:

Water Division:	(707) 543-4200
Sewer Division:	(707) 543-4200
Street Division:	(707) 543-3880
Survey Division:	(707) 543-3834

5-1.43 Potential Claims and Dispute Resolution: "Claim" means a separate demand by Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following: (A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by the City under the Contract; (B) Payment by the City of money or damages arising from work done by, or on behalf of, Contractor pursuant to the Contract and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; or (C) Payment of an amount that is disputed by the City.

Upon receipt of a Claim, the City shall conduct a reasonable review of the Claim and, within a period not to exceed 45 days, shall provide Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed, provided, the parties may extend the 45 day time period by mutual agreement.

If the City needs approval from the City Council to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the Claim, and the Council does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a Claim, the City shall have up to three days following the next duly publicly noticed meeting of the City Council after the 45-day period, or extension expires to provide Contractor a written statement identifying the disputed portion and the undisputed portion.

Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the City issues its written statement. If the City fails to issue a written statement, the Claim shall be deemed rejected in its entirety.

If a Contractor disputes the City's written response, or if the City fails to respond to a Claim within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the City shall conduct a meet and confer conference within 30 days for settlement of the dispute. Within 10 business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the City shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the City issues its written statement. Any disputed portion of the Claim, as identified by Contractor in writing, shall be submitted to nonbinding mediation, with the City and the Contractor sharing the associated costs equally. The City and Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the

disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

6 CONTROL OF MATERIALS

6-2.01 Source of Supply and Quality of Materials: All materials required to complete the work under the Contract shall be furnished by Contractor and shall be free of hazardous substances.

6-3.01 General: Statistical means will not be used by the City for determination of Standard Specification compliance. Whenever both operating range test results and Contract compliance requirements are specified in these special provisions, the operating range requirements shall apply to the individual test results.

6-3.01A Material Submittals: Upon award of the Contract by City, Contractor shall submit to the Engineer a list of all materials proposed to be used on this project and any supporting documentation and/or samples required and source of supply.

For material listed on the "Engineer's List of Approved Items" which is located in the Sewer and Water sections only of the City Standards, the Engineer shall be provided with the name of the manufacturer and model/part number for all material proposed for this project, unless that item has been replaced as shown on the Project Plans or in the Invitation for Bids.

For all other materials used on this project, regardless of the type of work, Contractor shall provide to the Engineer the name of the manufacturer and model/part number along with supporting documentation and/or samples that will allow the Engineer to determine the material's acceptability.

The Engineer reserves the right to reject any proposed material, whether on the City's "Engineer's List of Approved Items" or not. If the City obtains information indicating that a listed item is not performing satisfactorily or is found to be defective, that item will be rejected and Contractor shall submit a replacement for review at no additional cost to the City.

6-3.01B Material Guarantee: Before any contract is awarded, the bidder may be required to furnish samples of materials and detailed descriptions of equipment to be used in the construction of the project. The materials samples may be subjected to the tests provided for in the Standard Specifications or in this Invitation for Bids to determine their quality and fitness for the project. The successful bidder shall unconditionally guarantee project materials and workmanship for a period of one year from the date of recording of the Notice of Completion. The guarantee shall cover 100% of all costs of repairs within the one year period, including all costs of labor, materials, equipment, and incidentals. Except as may be otherwise provided in Section 3-1.05, the successful bidder shall provide a surety bond executed by a corporate surety authorized and admitted to transact a surety business in the state of California in the minimum amount of one-half of the Contract price to cover this guarantee.

6-3.05 Quality Assurance: California Test 216 (Relative Compaction) testing will be modified as follows: A mechanical compactor (Ploog Engineering Co. Model M 100 or equivalent) with 10-pound hammer and split compaction molds shall be used in lieu of the specified manual compaction equipment.

California Test 231 (Nuclear Gage Determination of In-Place Density) will be modified as follows: In-place density and relative compaction may be determined on the basis of individual test sites in lieu of the area concept, at the discretion of the Engineer.

6-4 Water Utility

6-4.01A Construction Water: All water required for the performance of the work shall be provided by Contractor. Prior to obtaining water from the City's water system, Contractor shall obtain a Water

Use Permit from the City of Santa Rosa Water Department and rent a hydrant or bridge meter. Contractor is responsible for the cost of all water and the cost of all deposits, permits and fees.

Contractor is prohibited from operating gate valves or fire hydrants on the City system.

The acquisition of water from the City's water system through un-metered hydrants or other facilities is a violation of City ordinance and State law. The use of water from sources other than the City's water system must be approved by the Engineer in advance of the use.

Citations and fines will be levied for violation of these and other utility regulations and deductions will be made from payments consistent with Section 7-1.02A(1) of the Standard Specifications.

6-4.01B Water Utility Notification: Contractors or parties requiring work of any kind by the City of Santa Rosa Water Department forces shall request such services a minimum of 48 hours in advance of the time such services are desired. Work requests which will involve the City of Santa Rosa Water Department forces for more than eight hours or an extensive number of City parts shall be requested a minimum of seven calendar days in advance.

If it is necessary to terminate or disrupt utility service to any customer, Contractor shall make the request for such work by City forces an additional 72 hours (three additional working days for a total of five working days advance notice) in advance of the time such services are desired to allow affected customers a minimum of 72 hours' notice. Contractors who fail to keep field appointments will be billed for scheduled City of Santa Rosa Water Department crew standby time which was used and the Contractor shall bear the costs incurred by the City of Santa Rosa's Water Department for re-notification of customers.

City of Santa Rosa Water Department crews work a 9/80 schedule. This schedule may prohibit shutdowns for tie-ins on alternating Fridays. After hours work or weekend work may be performed if prior authorization from the Engineer is obtained.

Other than the hours specified in this Invitation for Bids, requests by Contractor for after hours or weekend work is to be avoided whenever possible. Any overtime costs incurred by City for such work shall be borne by Contractor.

Interruption of utilities service to commercial customers shall be coordinated with the customer to minimize disruption to the enterprise to the greatest extent practicable. After notification by the Contractor of the need, the City of Santa Rosa Water Department will contact all commercial customers and inform Contractor accordingly.

6-4.01C Water Facility Damage: All damage caused to the City's water system shall be immediately reported to the Engineer.

Damage caused to the City's water system by Contractor's operations shall be repaired by the Contractor at Contractor's sole expense in a manner satisfactory to the City of Santa Rosa Water Department. Such repairs shall not be charged to the City or any City project. All repair work shall be witnessed and approved by the City of Santa Rosa Water Department prior to backfilling the excavation. The City will require re-excavation if backfilling occurs prior to inspection, which costs shall be borne by Contractor.

Contractor is responsible for, at its sole cost and expense, the repair and remediation of damage to property and facilities caused by any of the following circumstances:

- a. Contractor fails to make a written request for a markout or begins excavation without providing the City of Santa Rosa Water Department a reasonable opportunity to mark facilities;

- b. Contractor destroys markouts;
- c. Contractor fails to perform hand digging or probing for utilities near markouts; or
- d. Contractor fails to use reasonable caution, regardless of whether markouts are present or clear. Reasonable caution includes any efforts to avoid damaging existing facilities, such as when excavating in the vicinity of water mains.

City may, in its discretion, opt to make the repairs for which Contractor is responsible with its own forces. In such cases, the repairs will be made at Contractor's expense in accordance with the emergency repair rate schedule of the City of Santa Rosa Water Department. The City may make repairs whenever restoration of service requires extraordinary speed or special equipment. Contractor will be billed accordingly and City shall have the right and option to withhold payment hereunder, or a portion thereof, for any such costs billed but not promptly paid by Contractor.

6-4.02 Salvage: All valves, hydrants, and other appurtenances of the water system that are the property of City and removed by Contractor shall be delivered to the City's Municipal Services Center (55 Stony Point Road) unless Contractor has obtained specific written approval from the City of Santa Rosa Water Department to otherwise dispose of the materials.

6-4.03 Trade Names and Alternatives: Unless otherwise specified, material and equipment specifications that identify a particular patent, trade name or manufacturer, may be satisfied through substitute materials and equipment accepted by the City. Contractor may offer substitute materials and equipment of equal or better quality to the City. Any such offer shall be made in writing to the Engineer at least four weeks in advance of the time Contractor wishes to order the materials or equipment. Contractor shall include sufficient data which, together with any other information the Engineer may require, will enable the Engineer to determine the acceptability of the materials and equipment. When the substitute materials or equipment necessitate changes to any part of the work, the information shall include drawings and details showing all such changes and Contractor shall perform these changes as a part of any acceptance of substitute materials or equipment. The use of substituted materials and equipment will be permitted only after written acceptance of the materials and equipment by the Engineer. Such acceptance shall not relieve the Contractor from full responsibility for the sufficiency, quality and performance of the substitute materials and equipment.

The City will not, under any circumstances, acknowledge or consider any offers to accept substitute materials or equipment between the dates of public notice of advertisement and the bid opening.

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1.02A(1) Forfeitures for Health and Safety Violations: Contractor shall comply with all applicable provisions of the Santa Rosa City Code and any failure to do so shall constitute a breach of the Contract. In the event of any violation of the Santa Rosa City Code that may impact public health and safety, including, but not limited to Chapter 17-12, "Storm Water" and Chapter 13-04, "Street Encroachments," City shall have the right to impose a charge against Contractor in an amount equal to \$500.00 per violation per day. Prior to the imposition of any charge hereunder, City shall first provide a written notice to Contractor of the violation and setting forth a reasonable period of time for Contractor to cure the violation(s). In the event Contractor fails to cure any such violation within the time provided, City shall have the right, in addition to all other rights and remedies available to City, to deduct and withhold as a permanent forfeiture by Contractor the appropriate amounts from any payment otherwise due Contractor under this Contract.

7-1.02K(2) Wages: Pursuant to Labor Code sections 1770 *et seq.*, each laborer or mechanic of Contractor or any subcontractor engaged in work on the project under this contract shall be paid not less than the hourly wage rate of per diem wages set forth in the prevailing wage rate schedule published by the Director of Industrial Relations, regardless of any contractual relationship which may be alleged to exist between Contractor or any subcontractor and such laborers and mechanics. A copy of the schedule of prevailing wage rates can be obtained online at www.dir.ca.gov or from the Department of Transportation and Public Works at 69 Stony Circle, Santa Rosa.

Any laborer or mechanic employed to perform work on the public works project under this Contract, which work is not covered by any of the foregoing classifications, shall be paid not less than the prevailing wage rate of per diem wages specified herein for the classification which most nearly corresponds to the work to be performed by the worker.

The foregoing specified prevailing wage rates are minimum rates only, and Contractor may pay any wage rate in excess of the applicable rate.

Pursuant to Labor Code Section 1775, Contractor as a penalty to the owner shall forfeit not more than \$200.00 for each calendar day, or a portion thereof, for each worker paid less than the prevailing wage rate established by the Department of Industrial Relations for such work or craft in which such worker is employed. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which the worker was paid less than the prevailing wage rate shall be paid to each worker by Contractor.

Contractor shall only provide prevailing wage reports upon written request from City.

7-1.02K(4) Apprentices: Contractor agrees to comply with Chapter 1, Part 7, Division 2, sections 1777.5 *et seq.* of the California Labor Code. These sections require contractors and subcontractors to employ apprentices in apprenticeable occupations in a ratio of not less than one hour of apprentice work for each five hours of journeyman work (unless an exception is granted in accordance with Section 1777.5), and the contractors and subcontractors shall not discriminate among otherwise qualified employees as apprentices solely on the ground of sex, race, religion, creed, national origin, ancestry, or color. Only apprentices as defined in Labor Code section 3077, who are in training under apprenticeship standards and who have written apprentice agreements will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the prime contractor for all apprenticeable occupations.

7-1.02K(6)(a)(1) Notice to Vendors: Attention is directed to the current OSHA Standards. All equipment, tools and materials which are furnished and/or installed as part of this Contract shall meet or exceed the aforementioned standards in order to be considered acceptable.

7-1.02K(6)(b) Excavation Safety: When the digging or excavation occurs during project construction, Contractor shall:

- a. Promptly notify City in writing of the following conditions before any such conditions are disturbed:
 1. Material that the Contractor believes may be hazardous waste as defined in Health and Safety Code section 25117 that is required to be removed to a Class I, Class II or Class III disposal site in accordance with provisions of existing law;
 2. Subsurface or latent physical conditions at the site differing from those indicated in the Invitation for Bids; and
 3. Physical conditions at the site of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in the type of work under the Contract.
- b. The City will investigate the conditions and will issue a change order under the terms of the Contract if it finds that the conditions warrant it.
- c. If a dispute arises between City and Contractor as to whether a change order is warranted, Contractor shall not be excused from any scheduled completion date provided for in the Contract, but shall proceed with all work to be performed under the Contract.

7-1.02K(6)(b)(1) Trench Excavation Safety Plans: When the estimated cost for the excavation of any trench or trenches five feet or more in depth will exceed \$25,000.00, Contractor shall submit to the Engineer in advance of excavation a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards established by the construction safety orders, or if the trench is anticipated to be greater than 20 feet, the plan shall be prepared by a registered civil or structural engineer.

A permit to do the above described work shall be obtained from the State of California, Division of Industrial Safety. Proof of such permit shall be submitted to the Engineer prior to starting the trench work.

Full compensation for complying with the provisions of this section shall be considered as included in the Contract price and no additional allowance will be made for the work.

7-1.02K(6)(d) Confined Space Safety: Any confined space entry for this project, including but not limited to manhole or water storage tank entry, will require a confined space entry permit pursuant to Cal/OSHA regulations as set forth in title 8 California Code of Regulations (CCR) sections 5157 or 5158. Confined space entry shall have the meaning ascribed in title 8 CCR sections 5157 and 5158. For any confined space entry for construction operations regulated by title 8 CCR section 1502, Contractor shall comply with title 8 CCR section 5158, "Other Confined Space Operations." For any other confined space operations, Contractor shall comply with title 8 CCR section 5157, "Permit-Required Confined Spaces."

Attention is directed to the technical specifications in the Special Provisions for information regarding entry to any City maintained confined space. Pursuant to title 8 CCR section 5157, Contractor is required to obtain any available information regarding hazards and operations for any City maintained confined spaces. The City maintained Confined Space Entry Manual is available

for viewing at the City of Santa Rosa Water Department or Transportation and Public Works Department office at 69 Stony Circle, Santa Rosa.

Contractor shall immediately inform the Engineer of any previously unidentified hazards confronted or created during confined space entry.

7-1.02L(2)(a) Patents and Royalties: All fees, royalties, or claims for any patented invention, article, process or method that may be used upon or in any manner connected with the work under this Contract shall be paid by Contractor. Contractor and its sureties shall protect and hold harmless City and its officers, agents, and employees from any and all demands made for such fees royalties or claims brought or made by any third party, and before the final payment is made on the account of the Contract, Contractor shall, if requested by City, furnish acceptable proof of a proper release from all such claims and liabilities.

Should Contractor, its officers, agents, or employees, or any one of them be enjoined from furnishing or using any invention, article, material, or plans supplied or required to be supplied or used under the Contract, Contractor shall promptly substitute other articles, materials, or appliances in lieu thereof of equal efficiency, quality, finish, suitability, and market value, and satisfactory in all respects to the Engineer. In the event that the Engineer elects, in lieu of such substitution, to have supplied and to retain and use any such invention, article, materials, or plans as may be required to be supplied by the Contract, Contractor shall pay such royalties and secure such valid licenses as may be requisite and necessary for City, its officers, agents, and employees, or any one of them to use such invention, article, materials, or appliance without being disturbed or in any way interfered with by any proceeding in law of equity on account thereof. Should Contractor neglect or refuse to make the substitution promptly or to pay such royalties and secure such licenses as may be necessary, then in that event the Engineer shall have the right to make such substitutions or City may pay such royalties and secure such licenses and charge Contractor even though final payment under the Contract may have been made.

7-1.02M(3) Mined Materials: California Public Contract Code section 20676 prohibits surface mining operators which are subject to the Surface Mining and Reclamation Act of 1975 (SMARA) from selling California mined construction material to the City unless the operator is identified in a list referred as the **3098 List**. The List, which is maintained by the Department of Conservation's Office of Mine Reclamation (OMR), changes throughout the year and can be viewed at the OMR website: http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm. To confirm whether or not a specific operator is on the List at any given time, Contractor shall call the OMR at (916)323-9198.

7-1.03A Maintaining Traffic: Attention is directed to Sections 7-1.04 of the Standard Specifications and to the following modifications thereof.

If construction is within City owned right-of-way, provisions shall be made for the safe passage of public traffic through the work site at all times consistent with the requirements of Santa Rosa City Code Chapter 13-04.

Except for projects to be performed under a minor contract, Contractor shall install and maintain project identification signs at each end of the project or as directed by the Engineer two weeks prior to any construction activity. City shall furnish the appropriate sign panels upon request from Contractor. To mount the sign panels, Contractor shall furnish and install 4" X 4" posts or mount by other appropriate methods as approved by the Engineer. These sign panels shall be returned to the City Corporation Yard at 55 Stony Point Road after completion of the project.

Two weeks prior to any construction activity, advance notice signs for road closures shall be furnished and installed by Contractor at each end of the project and shall remain in place throughout the duration of the subject closure. Details of panel construction and lettering shall be approved by the Engineer.

Contractor shall furnish, install, and maintain at its expense all barricades, signs, lights, and other devices necessary to adequately warn of any obstructions to the traveled and pedestrian way and provide flaggers as necessary for the safety of public traffic and pedestrians and to provide access to property adjacent to the work site and Contractor shall comply with the Americans with Disabilities Act of 1990 (42 U.S.C. 12101, *et seq.*) (ADA) and any regulations and guidelines issued pursuant to the ADA.

Contractor shall comply with the current edition of the California Manual of Uniform Traffic Control Devices (CA MUTCD) for all items related to traffic within the work site.

Rain and other occurrences that may cause the suspension or delay of the work shall in no way relieve Contractor of its responsibility to provide traffic control and public access through the work site as specified herein. At all times, Contractor shall keep at the work site such materials, forces and equipment as may be necessary to keep roads, streets, and driveways within the work site open to traffic and in good repair and shall expedite the passage of such traffic, using such forces and equipment as may be necessary.

Should Contractor fail, in the opinion of the Engineer, to provide all the materials, forces and equipment necessary to maintain traffic through the work site as set forth herein, City may take steps necessary to remedy any such failure, including but not limited to causing such work to be performed and/or suspending any further work under the Contract. Any such remedial cost and expense incurred by the City, plus an administrative charge of 15%, shall be immediately due and payable by Contractor and may be deducted from any amounts owed to Contractor hereunder. In the event there are insufficient sums owed to Contractor hereunder to cover the foregoing costs and charges, City shall have the right to pursue any other remedy to recover the same, including but not limited to, proceeding against any surety or bond in favor of City. City's rights under Section 7-1.02 are intended to be in addition to and not in lieu of any charges imposed by City against Contractor under Section 7-1.02A(1) above for violations of the Santa Rosa City Code.

Contractor shall be responsible for informing emergency response agencies operating within the area of the work of obstructions to either public or private roads caused by reason of Contractor's operations hereunder.

Contractor shall make provisions for the safe passage of pedestrians around the project work site at all times.

8 PROSECUTION AND PROGRESS

8-1.01A Assignments: Once awarded, this Contract shall not be transferred, assigned, or sub-contracted, except as herein expressly provided without the prior written consent of the City in the City's sole and absolute discretion. See Section 5-1.12 of the Standard Specifications.

8-1.04B Standard Start: Contractor shall begin work within ten calendar days after the date authorized in the Notice to Proceed and shall diligently prosecute the Contract to completion as noted in 8-1.05.

8-1.05 Time of Completion:

Phase I Work: Construction of all improvements outside the biosolids barn shall be completed by July 2018.

Phase II Work: Construction of all improvements inside the biosolids barn shall be completed while the barn is empty between October 1, 2018 and October 31, 2018.

Unless otherwise directed by Engineer, Contractor shall not conduct any activities that generate noise earlier than 7:00 a.m. or later than 6:00 p.m.

8-1.10 Liquidated Damages: Contractor hereby agrees that Contractor shall pay to the City of Santa Rosa, the sum of one thousand dollars (\$1,000.00) per day liquidated damages for each and every calendar day delay over and above the number of calendar days prescribed above for finishing the work. Any regulatory fines levied and other costs incurred as a direct or indirect result of not meeting of the completion date will be additive to this amount.

9 MEASUREMENT AND PAYMENT

9-1.04 Force Account Work: All work done on a force account basis shall be recorded daily on report sheets prepared by Contractor and signed by both the Engineer and Contractor. Such reports shall thereafter be considered the true record of force account work performed during the project. Such reports shall be furnished to the Engineer and a copy retained by Contractor.

All extensions of labor, equipment, and material costs shall be completed by Contractor and submitted to the Engineer within 30 days of the completion of the extra work. Completed and extended extra work reports received later than the times herein prescribed may be deemed invalid and rejected without payment at the discretion of the Engineer.

9-1.07 Payment Adjustments For Price Index Fluctuations: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

9-1.16 Progress Payments: Once each month for progress pay purposes, the City will prepare a written estimate of the total amount of completed work and accepted materials purchased by Contractor but not installed. The City shall retain five percent of such estimated value of the completed work and the unused materials and pay Contractor the balance after deducting all previous payments and all sums to be retained under the provisions of the Contract. No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the Contract or when, in the Engineer's judgment, the total value of the completed work since the last estimate is less than \$500.00. No such estimate or payment shall be construed to be an acceptance of any defective work or improper materials.

After Contract acceptance, the Engineer will prepare a written proposed final estimate of the proposed final quantities of work completed under the Contract and the value of such work and will submit such estimate to Contractor. The City shall retain five percent of such estimated value of the work done and shall pay to Contractor the balance after deducting all amounts to be retained under the provisions of the Contract.

The City may, at its option and at any time, retain out of any amounts due Contractor sums sufficient to cover any unpaid claims of City or others, provided that sworn statements of all non-City claims shall have been filed with the Director of Finance.

9-1.16E(6) Substitution of Securities for Withheld Amounts: Pursuant to Public Contract Code section 22300, securities may be substituted for any moneys withheld by City to ensure performance under this Contract, provided that substitution of securities provisions shall not be required in contracts in which there will be financing provided by the Farmer's Home Administration of the United States Department of Agriculture pursuant to the Consolidated Farm and Rural Development Act (7 USC sections 1921 *et seq.*), and where federal regulations or policies or both do not allow the substitution of securities. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with the City, or with a state or federally chartered bank as the escrow agent, which shall then pay such moneys to Contractor. The Director of Finance is authorized to execute substitution of securities agreements on behalf of the City. The City will return the securities to Contractor upon satisfactory completion of the Contract as determined by City in its sole discretion and the resolution of all outstanding claims against the securities. Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon.

Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit or any other security mutually agreed to by Contractor and the City, provided that the substituted security is equal to or not less than five percent of the Contract amount.

Security substitutions must be submitted by Contractor and approved by City prior to the time of the first progress payment to be made under the Contract. No other method of substituting securities for retention will be accepted. The security substitution shall be done only upon execution of an agreement satisfactory to City which includes the following provisions:

- a. The amount of securities to be deposited;
- b. The terms and conditions of conversion to cash in case of the default of Contractor;
and
- c. The procedure for return of securities upon completion of the Contract.

9-1.17D Final Payment and Claims: The processing of payment of the final estimate shall not be commenced less than 35 days after the date of recording of the Notice of Completion with the County Recorder's Office. Contractor is advised that it takes approximately ten days for a check to be issued following a request for payment.

Contractor shall submit its written statement of all claims for additional compensation under the Contract to the Engineer within 15 days after submission to Contractor of the proposed final estimate.

If Contractor does not file a claim within the 15 day period, or upon Contractor's approval, the Engineer will issue a final written estimate and the City shall pay to Contractor the entire sum due after deducting all previous payments, if any, and all amounts to be retained under the provisions of the Contract.

If Contractor files a claim within the 15 day period, the Engineer will furnish a semi-final estimate and pay the amount due under the semi-final estimate within 30 days. The semi-final estimate is conclusive as to the amount payable except as may be affected by claims and any amount retained. The Engineer shall then consider and investigate such claim, and shall make such revision in the final quantities as the Engineer may find to be due, and shall then make and issue a final written estimate. The City will pay the amount due, after deducting all previous payments, if any, and amounts to be retained under the provisions of the Contract.

Any and all prior partial estimates and payments shall be subject to correction in the final estimate and payment.

The final estimate shall be conclusive and binding against both parties to the Contract on all questions relating to the performance of the Contract and the amount of work done thereunder and compensation therefor, except in the case of gross error.

9-1.17D(3) Final Determination of Claims: Claims filed by Contractor shall be in sufficient detail to enable the Engineer to determine the basis and amount of the Claims. Contractor shall also furnish reasonable documentation to the City to support Claims. If additional information is required by the Engineer, Contractor shall provide such information to the Engineer no later than the 15th day after receipt of the written request from the Engineer. If the 15th day falls on a weekend, holiday, or day City offices are closed, then the information shall be provided to the Engineer no later than close of the next business day. Failure to submit the requested information to the Engineer within the time specified will be sufficient cause for denying the Claim.

Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated Claim

investigator or auditor shall have access to those records and any other records as may be reasonably required by the Engineer to determine the facts or contentions in each Claim. Failure to grant access to such records shall be sufficient cause for denying the Claims.

9-1.22 Arbitration: Any references to Arbitration in the Standard Specifications are deleted in their entirety.

Claims submitted by Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code sections 12650 *et seq.*, the undersigned,

_____,
(Name)

_____ of
(Title)

(Contractor)

hereby certifies that the claim for additional compensation made herein is supported by a true statement of the actual costs incurred and time expended on this project, and is fully documented by records maintained by Contractor.

Dated _____

/s/ _____

Subscribed and sworn before me this _____ day of

Notary Public

My Commission Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead expenses, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any such overhead claim shall also be subject to audit by the City at its discretion.

Any costs or expenses incurred by the City in reviewing or auditing any claims that are not supported by Contractor's cost accounting or other records shall be deemed to be damages incurred by the City within the meaning of the California False Claims Act.



Technical Specifications

For

**ALPHA FARM BIOSOLIDS STORAGE FACILITY
FIRE SPRINKLER SYSTEM FREEZE PROTECTION**

**Contract Number
C02012**

FEBRUARY 2018



13 WATER POLLUTION CONTROL

13-1 General

13-1.01A: Water Pollution Control shall be performed in accordance with Section 13, Water Pollution Control, of the Standard Specifications and these technical specifications. In addition, construction activities shall comply with:

1. The current California Water Quality Control Board, North Coast Region Order No. National Pollutant Discharge Elimination System Municipal Storm Water Permit, commonly referred to as the "Storm Water Permit". A copy of the Storm Water Permit is available for review at the City of Santa Rosa Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, CA, and at www.srcity.org/stormwaterpermit.
2. The California Stormwater Quality Association Storm Water BMP Handbook for Construction (CASQA Handbook). BMPs shall be selected, installed and maintained in accordance with the latest edition. A copy of the handbook can be viewed at the City of Santa Rosa Department of Transportation and Public Works office at 69 Stony Circle or downloaded from CASQA, <http://www.casqa.org/>.

In this technical specification the CASQA Handbook BMP numbers are appended to the associated Standard Specification sections. If a conflict occurs the CASQA Handbook BMP's shall govern.

13-2 Water Pollution Control Program

13-1.04 Payment: Full compensation for conforming to the provisions of Section 13 shall be considered as included in the prices paid for **various contract items** of work, and no additional allowance will be made therefore.

13-4.03B: Spill Prevention and Control/CASQA Spill Prevention and Control (BMP WM-4):

If a spill occurs at the construction site and the contractor does not take immediate and adequate steps to contain and clean up the spill, especially if rain is threatening or if a discharge to a storm drain or creek could occur, the City shall have the right, in its sole and absolute discretion, to clean up the spill using City forces or an independent contractor. The cost of any such cleanup, in addition to recovery of any penalty or fine imposed upon the City, plus an administrative charge of fifteen percent (15%) of the costs incurred by the City, shall be deducted from any amounts owed to Contractor hereunder.

In the event there are insufficient amounts owed to Contractor hereunder to cover the foregoing costs and charges, the City shall have the right to pursue any other remedy to recover same, including, but not limited to, proceeding against any surety or bond in favor of the City. The City's rights under this section are intended to be in addition to and not in lieu of any imposed by the City against Contractor for violations of City Code Chapter 17-12, "Storm Water".

13-4.03C(3): Stockpile Management/CASQA Stockpile Management (BMP WM-3): Do not block storm water flows.

13-4.03D(1): Waste Management/CASQA Solid Waste Management (BMP WM-5): The Contractor shall dispose of all trash, rubbish, and waste materials of any kind generated by the contractor, subcontractor, or any company hired by the Contractor on a daily basis.

13-4.03D(3): Concrete Waste/CASQA Concrete Waste Management (BMP WM-8):

Ensure the containment of concrete washout areas and other washout areas that may contain pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

13-4.03D(4): Sanitary and Septic Waste/CASQA Sanitary and Septic Waste Management (BMP WM-9):

Sanitation facilities must be maintained periodically by a licensed service to keep them in good working order and prevent overflows. Portable toilets are required to have secondary containment.

13-4.03D(5): Liquid Waste: Liquid waste includes water generated from excavation dewatering. Minimize transfer piping by locating containers near the excavation to be dewatered while protecting the containers from moving vehicles and equipment.

13-4.03E(7): Paving, Sealing, Sawcutting, Grooving, and Grinding Activities: As listed in Part 9, sections 4 and 5 of the Storm Water Permit, the following additional BMPs shall be implemented for paving, repaving, reconstruction, patching, digouts or resurfacing.

1. Restrict paving and repaving activity to exclude periods of rainfall or predicted rainfall unless required by emergency conditions;
2. Install BMPs at all susceptible storm drain inlets and manholes to prevent paving products and tack coat from entering;
3. Prevent the discharge of release agents including soybean oil, other oils, or diesel to the storm water drainage system or watercourses;
4. Minimize non-storm water runoff from water use for the roller and for evaporative cooling of the asphalt;
5. Clean equipment over absorbent pads, drip pans, plastic sheeting or other material to capture all spillage and dispose of properly
6. Collect liquid waste in a container, with a secure lid, for transport to a maintenance facility to be reused, recycled, or disposed of properly **13-4.03D(5)**;
7. Collect solid waste by shoveling and vacuuming or sweeping and securing in an appropriate container for transport to a maintenance facility to be reused, recycled, or disposed of properly **13-4.03D(5)**;
8. Cover "cold-mix" asphalt (i.e., pre-mixed aggregate and asphalt binder) with protective sheeting during a rainstorm **13-4.03C(3)**;
9. Cover loads with tarp before haul-off to a storage site, ensuring that trucks are not overloaded;
10. Minimize airborne dust by using water spray during grinding **14-9.03**;
11. Avoid stockpiling soil, sand, sediment, asphalt material and asphalt grindings materials or rubble in or near storm water drainage system or watercourses **13-4.03C(1)**,

[Revised: 12/15/16 CDA STD2010]

14 ENVIRONMENTAL STEWARDSHIP

14-9.03A General: Sweeping per section 14-9.03C shall also be performed to prevent and alleviate dust.

Sweeping, covering stockpiles, applying water, and/or dust palliative, to control dust caused by public traffic is not change order work.

14-9.03C Construction: All dust-producing work and unpaved construction sites shall require a minimum watering in the middle and ending of each workday. The frequency of watering shall increase if dust is airborne. Watering shall not produce runoff.

Contractor shall maintain dust control to the satisfaction of the Engineer, 7 days a week, 24 hours per day.

At the end of each work day the Contractor shall thoroughly sweep all streets in the work zone to minimize airborne dust.

At the end of each work week the Contractor shall sweep all streets in the work zone with a commercial street sweeping truck equipped with a rear pick up broom.

At the Engineer's discretion additional sweeping or watering may be required, including the use of a commercial street sweeping truck equipped with a rear pick up broom, at no additional cost to the City.

14-9.03D Payment: Full compensation for conforming to Section 14 shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

14-10.01 General: The Contractor shall dispose of all portland cement concrete and asphalt concrete, generated from removal or demolition activities on the project, at a recycler for these materials. The Contractor shall provide receipts verifying delivery and approximate quantity (in tons) of the material delivered to a material recycler.

All other excess materials from the project shall become the property of the Contractor and shall be disposed of by him, at his expense.

14-10.02A(1) Submittals: Submit a Solid Waste Disposal and Recycling Report prior to final acceptance of work performed under the Contract. Show the types and amounts of project-generated solid waste taken to or diverted from landfills or reused on the project.

In general, the Contractor shall maintain awareness of potential signs of soil and groundwater contamination throughout the project limits and shall notify the City immediately upon discovery of any potential soil or groundwater contamination.

The Contractor shall provide 40-hour OSHA-HAZWOPER certified workers in the contaminated area and provide a field Site Safety Officer that is also an 8-hour OSHA-HAZWOPER Supervisor trained to directly oversee the contaminated materials removal and handling operation. All workers in this circumstance must have their initial and

annual renewal refresher training, medical clearance and personal protection equipment in accordance with 8CCR Section 5192.

[Revised: 01/08/18-CDA STD2010]

15 EXISTING FACILITIES

15-1.03A General: Existing facilities disturbed by construction shall conform to the applicable provisions of Section 5-1.36. All existing active utilities found to reside in excavated areas shall be supported in place with service maintained during construction. The Contractor shall be responsible for any damage caused by their operations and any needed repairs shall be completed to the Engineer's satisfaction.

Existing storm drains found to reside in excavated areas shall be supported, removed, or replaced at the Contractor's option and at no additional cost to the City. The Contractor shall be responsible for maintaining the existing line and grade of the storm drains. If the Contractor elects to remove and replace, it shall be done per applicable City Standards and Specifications.

Existing utility trenches and/or structures that are in close proximity to proposed trenches shall be safeguarded in an appropriate manner from damage.

15-1.04 Payment: Full compensation for supporting, removal and disposal of existing utilities and their appurtenances is considered as included in the contract prices paid for various contract items of work and no additional allowance will be made therefor.

15-3.03 Construction: All removed concrete shall become the property of the Contractor and shall be immediately off-hauled. None of the removed concrete shall be dumped or stockpiled on the work site. The Contractor shall dispose of all removed concrete at a recycler for this material. Burying of broken concrete within the limits of the project will not be allowed.

All concrete which is to be removed from sidewalk, curb, gutter and driveway areas shall be removed to the nearest score mark or construction joint as directed by the Engineer unless otherwise noted on Project Plans. The edge of existing concrete to remain shall be neat and free of defects. Saw cutting may be required to achieve this.

Reinforcing steel may be encountered in portions of concrete to be removed and no additional allowance will be made for the removal of such steel.

Landscaping and other surfaces or structures shall be restored to original condition at no additional cost to the City.

15-3.04 Payment: Payment for saw cutting, removal and disposal of concrete sidewalk, curb and gutter, driveway areas, and existing City monuments shall be included in the contract prices paid for various contract items of work and no additional allowance will be made therefor.

15-7 Utility Clearances: *All items noted in this Section shall take place prior to any other construction activities.*

Pothole information provided on the Project Plans shall be for reference use only and shall not be considered as accurate information for any other areas within the project limits.

Contractor shall investigate, confirm and/or determine the exact locations of existing utilities, and verify clearances between existing and proposed utilities at crossings and/or known potential conflicts. The Contractor shall determine elevations and alignments of existing utilities at connection points.

The Contractor shall provide all relevant information in writing to the Engineer immediately upon discovery of any conflict. Any delay in notification to the Engineer may delay direction and/or corrective action and a delay claim due to this reason shall not be considered by the City. The Contractor shall not proceed with any work that is in conflict until direction is provided by the Engineer and shall redirect crews to other contract work. All the information required to be obtained per this Section and any other information not noted but relative to the project shall be provided to the Engineer on a set of Plans when the investigative effort is complete.

15-7.01 Payment: Full compensation for verifying utility clearances, including but not limited to: potholing to verify potential conflicts, excavation; backfill; and paving is considered as included in the contract prices paid for various contract items of work and no additional allowance will be made therefor.

[Revised: 01/08/18-CDA STD2010]

19 EARTHWORK

19-1 General

19-1.01A Summary:

Excavating for trenching

19-1.03B Unsuitable Material: Stabilization of unsuitable material shall comply with the following provisions:

- A. Unsuitable material may be processed in place, may be excavated and placed on the grade or other locations suitable for further processing, or may be partially excavated and partially processed in place.
- B. Processing may consist of drying to provide a stable replacement material, or mixing with lime per Section 24.
- C. Stabilized material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

19-2.03B Surplus Material: Surplus soil from this project has been approved for disposal at the City's Pond 2 Decommissioning and Grading Project at 35 Stony Point Road Santa Rosa, CA.

The following Pond 2 surplus soil transport and placement conditions shall be adhered to:

- 1. Material must be free of asphalt concrete; asphalt and soil grindings associated with roadway excavation and reconstruction;
- 2. Soil beneath asphalt that was previously oiled for paving is not allowed;
- 3. Sewer, water or storm drain pipe of any kind or type are not allowed;
- 4. Concrete; metal; rock greater than 6" in size; vegetation; and other deleterious materials are not allowed;
- 5. The quantity of trucks and the volume of soil deposited in Pond 2 from this project will be tracked. Truck drivers will be required to sign a log and be subject to periodic inspections to insure that only soil from this project is deposited in Pond 2
- 6. The Contractor shall spread and compact all project soils deposited into Pond 2 to 85% relative compaction and testing will be provided and performed by the City's materials Engineering Laboratory. The cost of compaction testing will be borne by the City.
- 7. Contractor shall comply with all disposal regulations such as City, County, and/or State permits and licenses, as may be required.
- 8. Soil disposal shall be limited to Monday through Friday between the hours of 7:00 am and 4:30 pm. Advanced, 48-hour notice is required to the City inspector and Water prior to starting.
- 9. Pond 2 site access is directly affected by weather conditions. You should anticipate no access during and for some time after rain events, unless wet weather site conditions are met at your expense.

10. The haul route shall be through the City Municipal Service Yard. A 15 MPH speed limit shall be observed at all times with stopping at all crosswalks and stop signs. No trucks shall access the site via any other route.
11. Tracking of material from the disposal location onto any and all paved surfaces near the pond is not allowed. Should tracking become evident sweeping will be required at your cost no later than the end of day. Dust control shall be provided at all times in accordance with Section 10.
12. The Idling limits on In-Use Off-Road Diesel Vehicles in section 2449 (d) (3) in Title 13, article 4.8, chapter 9, California Code of Regulations (CCR) shall be effective and enforceable.

The City shall reserve the right to unconditionally suspend or revoke disposal at any time at no cost to the City.

19-2.04 Payment: Full compensation for excavation, removal and disposal of excavated materials is considered as included in the contract prices for various contract items of work and no additional allowance will be made therefor.

[Version: 05/18/15 DCM STD2010]

39 HOT MIX ASPHALT

39-1.01 General:

39-1.01A Summary:

Section 39 includes specific specifications for producing and placing Hot Mix Asphalt (HMA) by mixing aggregate and asphalt binder at a mixing plant and spreading and compacting the HMA mixture.

39-1.01B Definitions: For these specifications, HMA and asphalt concrete shall be the same.

Use Section 39-3 Method construction process of these specifications for HMA production and construction.

39-1.01C Description: Asphalt concrete shall be placed in separate lifts as shown on the Project Plans.

Asphalt concrete base shall be placed on the same day the area is excavated so that all areas will either have existing asphalt surface or new asphalt concrete base by the end of each working day. No subgrade areas shall be exposed or open to traffic during non-working hours.

Construction vehicles/equipment shall not be allowed on the newly placed asphalt concrete base until the day after it is placed. Super Dumps or other trucks with liftable trailing load bearing axles shall not be allowed on the newly placed asphalt concrete base at any time. All trucks or other construction equipment to be driven on the newly placed asphalt concrete base shall not exceed the surface load bearing capacity and shall not produce rutting or pumping at any time.

Where a vertical drop off will occur between the top of the new asphalt concrete base and a valley gutter, driveway, or side street conform, the Contractor shall install a temporary 10:1 asphalt taper.

All ground edges adjacent to curb ramps and driveways shall have temporary asphalt concrete ramps (tapers) installed if the asphalt concrete surfacing cannot be placed back the same day the existing pavement is removed. Kraft paper or other bond breaker shall be placed under the conform ramps to facilitate removal when paving operations start. Kraft paper or other bond inhibitor shall be placed under the temporary asphalt taper to facilitate removal when paving operations resume.

Temporary asphalt tapers and associated bond breaker material shall be removed prior to placement of the asphalt concrete surface lift. Where the bond breaker material adheres to the asphalt concrete base course it shall be fully removed with a method, approved by the Engineer that will in no way degrade the quality of the final product.

The Contractor shall furnish an excavation and paving plan which shall include the following:

1. Asphalt plant supplying mix including aggregate source

2. Disposal site for spoils
3. Type of trucks and equipment to be used
4. Haul routes through adjacent residential streets
5. Staging locations
6. Sequencing

A tack coat of SS-1h or SS-1 emulsified asphalt shall be applied to all asphalt concrete and concrete surfaces, and allowed to break immediately in advance of placing all lifts of asphalt concrete. Unless otherwise shown on the Plans, tack coat shall also be applied to all vertical mating surfaces and conforms to existing pavement, curbs, gutters, and construction joints, and allowed to break immediately in advance of placing all lifts of asphalt concrete. The tack coat shall be reapplied 1) where it becomes contaminated, and 2) where it is significantly tracked (removed) from the surface.

The asphalt concrete base and asphalt concrete surface courses shall be allowed to cool to 160° F at mid depth before the roadway is opened to traffic each day.

At the end of each work day during paving operations the location of all valves, manholes, monuments and any other facility overlaid with asphalt concrete and required to be raised to grade shall be marked in white paint.

39-1.02 Materials:

39-1.02B Tack Coat: Tack coat must comply with the specifications for asphaltic emulsion or asphalts. Tack coat shall be diluted SS1 or SS1h.

39-1.02C Asphalt Binder: Asphalt binder in HMA must comply with the specifications for asphalts.

Asphalt binder to be mixed with aggregate for asphalt concrete surface, leveling and base shall be PG64-16 grade paving asphalt.

The amount of asphalt binder to be mixed with the aggregate shall be specified by the Engineer at the time of paving. Different asphalt binder content may be specified for each lift and each location.

Liquid anti-stripping agent (LAS) shall be added to the asphalt binder at a rate of 0.5 to 1.0% by weight of asphalt binder. The LAS shall be AD-here LOF 65-00 or equivalent, and shall be stored, measured, and blended with the asphalt binder in accordance with the anti-stripping agent manufacture's recommended practice. The LAS can be added at the asphalt plant or at the refinery. When added at the asphalt plant, the equipment shall indicate and record the amount of LAS added. If added at the refinery, the shipping ticket from the refinery shall certify the type and amount of LAS added.

39-1.02E Aggregate: The aggregate grading of the various types of asphalt concrete shall conform to one of the following as directed by the Engineer:

Surface or Leveling Course.....3/4-inch HMA Type A, or 1/2-inch Coarse
HMA Type A, or 1/2-inch
Medium HMA Type A

Base Course.....¾-inch HMA Type A
 Aggregates should be of high abrasion resistance and durability. Excessively soft and friable aggregates are not allowed.
 The specified aggregate gradation must be determined before the addition of asphalt binder and includes supplemental fine aggregate.
 The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:

**Aggregate Gradation
 (Percentage Passing)
 HMA Types A
 ¾-inch HMA Type A**

Sieve sizes	TV limits	Allowable tolerance
1"	100	--
¾"	95–100	TV ± 5
⅜"	65–80	TV ± 5
No. 4	49–54	TV ± 5
No. 8	36–40	TV ± 5
No. 30	18–21	TV ± 5
No. 200	2.0–8.0	--

1/2-inch Coarse HMA Type A

Sieve sizes	TV limits	Allowable tolerance
¾"	100	—
1/2"	94–100	--
⅜"	70–90	--
No. 4	55–61	TV ± 5
No. 8	40–45	TV ± 5
No. 30	20–25	TV ± 5
No. 200	2.0–8.0	--

1/2-inch Medium HMA Type A

Sieve sizes	TV limits	Allowable tolerance
¾"	100	--
1/2"	95–100	--
⅜"	80–95	--
No. 4	59–66	TV ± 5
No. 8	43–49	TV ± 5
No. 30	22–27	TV ± 5
No. 200	2.0–8.0	--

Before the addition of asphalt binder and lime treatment, aggregate must have the values for the quality characteristics shown in the following table:

Quality characteristic	Test method	HMA Type A
------------------------	-------------	------------

Percent of crushed particles Coarse aggregate (% min.) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	90 75 70
Los Angeles Rattler (% max.) Loss at 100 rev. Loss at 500 rev.	California Test 211	10 45
Sand Equivalent (min.) ^a	California Test 217	50 ^b
Fine aggregate angularity (% min.)	California Test 234	45
Flat and elongated particles (% max. by weight @ 5:1)	California Test 235	10

^a Reported value must be the average of 3 tests from a single sample.

^b Minimum Sand Equivalent of 45 for asphalt concrete base.

39-1.02F Reclaimed Asphalt Pavement: Reclaimed Asphalt Pavement (RAP) may be used at the Contractor's option. If RAP is used, the Contractor shall provide the proposed mix design and the quality control for all HMA that includes RAP, in accordance with the following requirements:

1. Contractor shall provide City with a mix design per California Test 384 for the proposed RAP HMA.
2. As part of City's evaluation of RAP HMA, Contractor and City shall perform bitumen ratio tests on at least six split samples of Contractor's RAP to establish correlation between respective binder ignition ovens.
3. RAP shall be processed from reclaimed Asphalt Concrete pavement only.
4. RAP pile(s) shall be separate from the stacker pile, not intermingled with other materials, and stored on smooth surfaces free from debris and organic material.
5. The project RAP pile shall be processed and mixed, identified, and of adequate quantity for the proposed project. "Live" piles shall not be permitted.
6. Contractor shall sample the RAP pile and determine the bitumen ratio (using same binder ignition oven used in #2 above) and provide the test results to the City at least one week prior to producing RAP HMA.
7. A minimum of three samples shall be tested for bitumen ratio for RAP pile of 1500 tons, or portion thereof.
8. RAP pile shall be mixed such that individual bitumen ratio test results of RAP pile so not vary more than +/- 0.5%.
9. During RAP HMA production, RAP shall be sampled by the Contractor off of the belt (into the batch plant), per method established by the City, and samples provided to the City.
10. Bitumen ratio of RAP sampled off of the belt shall be 4.0% minimum, as determined by City binder ignition oven. City shall select binder content for RAP HMA mix per Specifications.
11. RAP content shall be no more than 20% by dry aggregate mass in the HMA. If proposing a change in the RAP content, the Contractor shall notify the Engineer. If the content changes more than 5%, the Contractor shall submit a new mix design.

12. Moisture content of RAP pile shall be 4.0% maximum, and shall be tested the day prior to the day of paving and tested/monitored during each day of HMA production.
13. RAP pile(s) shall be protected from exposure to moisture.
14. RAP HMA shall comply with all the specifications for HMA.
15. If batch mixing is used, RAP shall be kept separate from the virgin aggregate until both ingredients enter the weigh hopper or pugmill. After introduction to the pugmill and before asphalt binder is added, the mixing time for the virgin aggregate and RAP shall not be less than five seconds. After asphalt binder is added, the mixing time shall not be less than 30 seconds.
16. If continuous mixing is used, the RAP shall be protected from direct contact with the burner flame with a device such as a shield, separator, or second drum.
17. If any of the above criteria are not satisfied, or if the RAP HMA test result determined by the City are inconsistent, RAP HMA production shall stop for City projects until the issue(s) are corrected.

39-1.03 HOT MIX ASPHALT MIX DESIGN REQUIREMENTS:

39-1.03E Job Mix Formula Verification:

(Not Applicable)

39-1.08 Production:

39-1.08A General: During production, with approval of the Engineer, you may adjust hot or cold feed proportion controls for virgin aggregate and RAP.

39-1.12 Smoothness:

39-1.12A General: Determine HMA smoothness with a straightedge. The completed surfacing shall be thoroughly compacted, smooth and free from ruts, humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations or other objectionable marks in the asphalt concrete shall be discontinued, and acceptable equipment shall be furnished by the Contractor.

39-1.13 Hot Mix Asphalt On Bridge Decks: The aggregate grading of the asphalt concrete shall be as directed by the Engineer.

39-1.14 Miscellaneous Areas and Dikes: The aggregate grading for asphalt concrete placed on miscellaneous areas shall conform to that specified for the asphalt concrete placed on the traveled way, unless otherwise directed by the Engineer.

39-1.15 Minor Hot Mix Asphalt:

(Not Applicable)

39-3.02 Acceptance Criteria:

39-3.02A Testing: The acceptance testing requirement for Sand Equivalent shall be 50 (minimum) for asphalt concrete surface and 45 (minimum) for asphalt concrete base. HMA shall meet the following requirements.

Aggregate Micro-Deval (ASTM D6928-10) ¹	Tensile Strength Ratio, TSR (ASTM D7870) ²
≤16.0%	Not Required
16.1-18.0%	70 (minimum)
18.1-21.0%	80 (minimum)

¹ Asphalt concrete with an aggregate Micro-Deval loss greater than 21.0% shall be removed and replaced at the Contractor's expense. In addition, no single source of asphalt concrete aggregate shall have a Micro-Deval loss greater than 21.0%.

² TSR testing shall be performed on re-compacted asphalt concrete (per ASTM D7870), obtained from field cores, and tested within 30 days of asphalt concrete placement. Specimens tested shall include 1 unconditioned sample, and 2 conditioned samples as follows:

- a) 20.0 hour Adhesion cycle @ 60°C
- b) 3500 cycles @ 40 psi and 60°C

A single TSR test shall not represent more than 750 tons of asphalt concrete. Asphalt concrete not meeting the above requirements shall be removed and replaced at the Contractor's expense.

39-3.04 Transporting, Spreading, and Compacting:

numbers of coverages.

Test sections shall be approved on the basis of the attainment of 93% relative compaction and a satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 93% relative compaction. Relative density shall be the ratio of in-place density (ASTM Test Method D2950) to test maximum density (California Test 309, Method of Test for Determining Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt) determined during production paving.

The HMA may be cored during paving of the test sections, and the in-place density for each test section shall be the average of three core densities determined per California Test 308.

39-6 Payment:

Full compensation for **Asphalt Concrete Work** shall be considered as included in the contract prices paid for various contract items of work and no additional allowance will be made therefor.

[Revised: 03/07/17 Lab STD2010]

39A ASPHALT CONCRETE TRENCH PAVING

39A-1.01 Description: Asphalt concrete surfacing and asphalt concrete base and the placing thereof shall conform to the requirements of the Standard Specifications, Section 39 of the City Specifications and these Special Provisions.

39A-2.01 Asphalts: Temporary paving on all utility trenches and any other excavated areas shall be ½-inch maximum, medium grade aggregate hot mix asphalt concrete installed a minimum of two inches thick **placed each day** over the work.

Temporary paving around edges of steel plates shall be a hot mix ½-inch maximum, medium graded aggregate and SC 3000 asphalt binder for use the same day or SC 250 asphalt binder for use over a one week period.

The amount of asphalt binder to be mixed with the aggregate will be specified by the Engineer at the time of paving. Different asphalt binder content may be specified for each lift and each location.

Cutback shall not be stockpiled or used anywhere on the job site.

39A-5.01 Spreading Equipment: When trench width is three feet or less, the asphalt concrete used for trench paving may be deposited directly from the haul vehicle into the trench. The asphalt shall then be raked smooth prior to compaction.

39A-6.01 General Requirements: Areas outside of reconstruction or overlay limits shall receive permanent trench paving per City STD-215, the modified detail on the Plans or as specified herein. The Engineer may require additional paving beyond the minimum dimensions shown in STD-215.

The Contractor shall provide compaction of backfill and base material as the job progresses. Temporary paving, as specified in Section 39A-2.01, shall be placed over the work each day, leaving not more than 25 feet unpaved. This temporary paving shall be removed for final street reconstruction and/or trench paving. The 25 feet of unpaved trench shall be covered with skid resistant steel plates (with a coefficient of friction of 0.35 or greater per CTM342), capable of sustaining normal (H20) traffic loads without shifting or bouncing and shall be secured per Caltrans requirements. Plates that have areas where the skid resistant material is missing shall not be used and must be removed from the job site. Hot mix asphalt concrete shall be placed and compacted around all edges of steel plates with a sufficient width and gradual slope in order to provide a smooth transition to existing pavement. The Contractor shall only be allowed to plate one lateral trench at a time.

Temporary and permanent asphalt trench paving shall be even and smooth riding.

The Contractor shall monitor and maintain all temporary paving to the satisfaction of the Engineer.

Asphalt concrete used for temporary trench paving shall be removed and disposed of in accordance with Section 124 "Material Recycling".

Any existing manholes or valves that are encountered within the trench paving limits must be adjusted to grade per the requirements of Section 15 of these Special Provisions. The Contractor is responsible for all coordination with the various utility company owners and their representatives, as well as the cost to adjust the various utilities to grade.

39A-6.03 Compacting: Compaction shall be in accordance with Section 39-6.03 of the City Specifications, reprinted here for clarity.

The basis for approval shall be the attainment of 97% relative compaction and satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 97% relative compaction.

39A-8.02 Payment: Full compensation for furnishing and installing temporary and permanent paving asphalt shall be considered as included in the prices paid for the **various contract items** of work and no additional allowance will be made therefor.

[Revised: 8/28/13 STD2010]

90 CONCRETE

90-1.01C(6) Mix Design: The proportions of the water, sand and aggregate shall be regulated so as to produce a plastic, workable and cohesive mixture.

90-1.01D(2) Cementitious Material Content: Concrete shall contain a minimum of 564 pounds of cementitious material per cubic yard. The amount of cement by weight of the specified cementitious material shall be 75 to 85 percent.

90-1.01D(5) Compressive Strength: The 28 day compressive strength of concrete shall be 4000 pounds per square inch (psi) or greater.

90-1.01D(6) Curing Compound: Concrete shall be cured per Section 90-1.03B of the Standard Specifications. Pigmented curing compound or any other material that will leave a noticeable residue shall not be allowed.

90-1.02E(2) Chemical Admixtures: An admixture shall not be used to reduce the amount of cementitious material content.

90-1.04 Payment: Full compensation for concrete shall be considered included in the prices paid for **various contract items** of work, and no additional allowance will be made therefore.

05/18/2015 DCM 2010STD

124 MATERIAL RECYCLING

124-1.01 Description: The Contractor shall dispose of all portland cement concrete and asphalt concrete, generated from removal or demolition activities on the project, at a recycler for these materials. The Contractor shall provide receipts verifying delivery and approximate quantity (in tons) of the material delivered to a material recycler.

All other excess materials from the project shall become the property of the Contractor and shall be disposed of by him, at his expense.

124-1.02 Payment: Full compensation for material recycling as specified herein shall be considered as included in the contract prices paid for various items of work, and no additional compensation will be allowed therefor.

[Version: 11/6/14CDA STD2010]

A - FEES AND PERMITS

The Contractor shall obtain all necessary and required permits for the project. City building department permits are not required for this project. (Project is exempt per government code section 53091(d). All other required permits shall be obtained at the Contractor's expense.

[Version: 2/2/15CDA STD2010]

CITY OF SANTA ROSA

TECHNICAL SPECIFICATIONS
FOR
**ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE
PROTECTION**

CONTRACT NO. C02012

JANUARY 2018

KENNEDY/JENKS CONSULTANTS
200 4TH STREET, SUITE 210
SANTA ROSA, CA 95401
(707)293-1181

JOB NO. 1668022*00



SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. Bid items are presented to indicate major categories of the work for purposes of comparative bid analysis and payment breakdown for monthly progress payments. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor and equipment necessary to complete each bid item (work phase) as show and specified.
- B. **Bid Item – Alpha Farm Freeze Protection:** this bid item shall include all labor, materials, and equipment necessary to Provide heat tracing at existing fire sprinkler piping, a heat-trace controller and new circuit at existing electrical panel, and underground conduit and conductors between new controller and existing electrical panel and other work incidental thereto, complete in accordance with the Project Plans and as specified herein. Payment for the Bid item will be made at the lump sum price given in the Bid Schedule.

1.02 PROJECT SITE CONDITIONS

- A. The existing structure contains Class B biosolids approximately 11 months of the year. The structure will be empty during a planned facility shutdown for month of October. Contractor shall complete all work inside the structure during the planned facility shutdown.
- B. Contractor is responsible for preparing a workplan that identifies the locations and durations that access is to be provided. Workplan shall be coordinated with City staff to ensure adequate time is provided for them to the remove biosolids.
- C. City's contact for coordination is:
 - 1. Zachary Kay: (707) 543-3374
- D. Engineer's contact for coordination is:
 - 1. Tom Gorman: (707) 293-1179

1.03 WORK SEQUENCE

- A. General Requirements.
 - 1. Prepare workplan that identifies the areas where work will occur and the areas needed for ingress and egress to the work.
 - 2. Complete all work outside the existing structure prior to the planned shutdown period. Maintain access for City staff at all times.
 - 3. Planned utility service shutdowns to any service area shall be accomplished during periods of minimum use. The Contractor shall program work so that service will be restored in the minimum possible time. No utility shall be disconnected without prior written approval from the City. Provide at least two (2) working days notice to the City.
 - 4. The Contractor shall note that only certain structures, tie-ins and constraints are addressed in this Section. All work, whether or not addressed here, shall

be governed by applicable parts of this Section, and schedules and procedures further submitted for approval.

1.04 CONTRACTOR'S USE OF SITE AND OWNER'S CONTINUED OPERATIONS

- A. The Contractor shall confine its use of the site for work and storage to the Work Area Limits shown on the Contract Drawings. The Contractor's use of adjacent lands and roads for access to move onto and off of the site and for daily access of workers, material and equipment shall be arranged and scheduled to minimize interference with the Owner's continued operations.
- B. The Owner intends to continue operation of portions of its existing facility during all or most of the construction period. The Contractor shall plan and schedule its work to minimize impacting the Owner's continued operations and shall, at all times, maintain safe access for the Owner's operating personnel and equipment.
- C. The Contractor shall be responsible for maintaining safe emergency exiting for the Owner's and Contractor's personnel in all areas affected by the Contractor's work.

1.05 DOCUMENTING EXISTING

- A. Prior to commencing the Work, tour the site with the Owner and the Engineer. Examine and document photographically and in writing the condition of existing buildings, equipment, improvements, and landscape planting on or adjacent to the site. This record shall serve as a basis for determination of subsequent damage due to the Contractor's operations and shall be signed by all parties making the tour. Record existing conditions by making a minimum of **20** digital color photographs and a video showing all areas that may be affected during the Work. Provide **two (2)** 4x6 prints of each exposure and a CD with digital photos. Provide video on DVD.

1.06 SHUTDOWN OF EXISTING UTILITIES, SERVICES OR OPERATIONS

- A. Obtain the Engineer's approval at least seven (7) days prior to the shutdown of any utility, service or operation of any existing facility. Give required notice and make appropriate arrangements with utility owners and other affected parties prior to shutdown of any utility service. Base bids on work performed during normal working hours. The Owner may authorize a Change Order if work must be performed during premium time hours. The Contractor's Bid shall include the cost of premium time to perform work requiring utility shutdowns on weekends or outside of normal working hours.
- B. Schedule utility service or operations shutdowns for periods of minimum use and at the Owner's convenience. Have all required material, equipment and workers on site prior to beginning any work involving a possible shutdown. Perform work as required to reduce shutdown time to the minimum. In some cases, this may require increased numbers of workers and/or premium time night or weekend work.
- C. The Contract Price shall include the cost of additional workers and premium time work required to minimize the impact of utility service or operations shutdowns. If premium time work is required the difference in cost between performing the work during normal working hours and premium time will be covered by a Change Order.

1.07 REGULATORY REQUIREMENTS

- A. The codes and regulations together with local amendments when applicable adopted by the State and other governmental authorities having jurisdiction shall establish minimum requirements for this project. This project shall comply with the following:
 - 1. California Code of Regulations
 - a. Title 8, Industrial Relations: Especially CAL-OSHA and Elevator Safety Orders.
 - b. Title 17, Public Health: Sections applicable to Food Service Facilities.
 - c. Title 19, Public Safety: Portions of the work regulated by the State Fire Marshal.
 - d. Title 24, Building Standards: Regulations applicable to Essential Service Facilities, Energy Conservation, Public Assembly and Handicapped Access.
- B. The latest edition of the requirements in effect at the date of submission of bids shall apply.
- C. In cases where the Contract Documents are more restrictive than applicable codes, the Contractor shall comply with the Contract Documents.

1.08 REFERENCE STANDARDS

- A. When these specifications state that Work or tests shall conform to specific provisions in a referenced standard, specification, code, recommendation or manual published by an association, organization, society or agency the referenced provisions, as they apply to the Work of the Contractor only shall be considered a part of these specifications as fully as if included in total. When these specifications or applicable codes contain higher or more restrictive requirements than those contained in reference standards these specifications or applicable codes shall govern.
- B. The latest edition of a referenced standard published at the time of submission of bids shall apply unless a specific date for the referenced standard is cited in these specifications.
- C. General provisions in referenced standards, specifications, manuals or codes shall not change the specific duties and responsibilities between any of the parties involved in this work from those described in the General Conditions. Provisions in referenced standards with regard to measurement and payment shall not apply to this Work unless specifically cited.

1.09 SPECIFICATION LANGUAGE AND STYLE

- A. Many parts of the Specifications as well as notes on the Drawings are written in the active voice and are addressed to the Contractor.
 - 1. When words or phrases requiring an action or performance of a task are used, it means that the Contractor shall provide the action or perform the task. For example: provide, perform, install, furnish, erect, connect, test, operate, adjust or similar words mean that the Contractor shall perform the action or task referred to.
 - 2. When words or phrases requiring selection, acceptance, approval, review, direction, designation or similar actions are referred to, it means that such

actions are the Owner's or the Engineer's prerogative and that the Contractor must obtain such action before proceeding.

- B. Requirements in the Specifications and Drawings apply to all work of a similar type, kind or class even though the word "all" or "typical" may not be stated.

1.10 DEFINITIONS

- A. The following terms, when used in the Contract Documents, shall have the meanings listed:

ACCEPTABLE	"acceptable to the Engineer"
PERFORM	"perform all operations required to complete the work referred to in accordance with the intent of the Contract Documents"
PROVIDE	"furnish and install the work referred to including proper anchorage, connection to required utilities or other work, testing, adjustment and startup ready to put in service and perform the intended function"
REQUIRED	"required by the Contract Documents or required to complete the Work and produce the intended results"
SATISFACTORY	"acceptable to the Engineer"
SHOWN	"as indicated on the Drawings"
SITE	"geographical location of the Project and land within the work area shown on the contract drawings and within which the Work will be installed or built"
SPECIFIED	"as written in the Contract Documents including the Specifications and the Drawings"
SUBMIT	"submit to the Engineer"

1.11 ABBREVIATIONS

- A. The following acronyms or abbreviations are used in these specifications for the organizations listed.

<u>Abbreviation</u>	<u>Stands for</u>
AASHTO	American Association of State Highway and Transportation Officials
AAMA	Architectural Aluminum Manufacturers Association
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
ADC	Air Diffusion Council
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AI	Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standard Institute (formerly United States of America Standards Institute)
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers

<u>Abbreviation</u>	<u>Stands for</u>
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	ASTM International
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
CAGI	Compressed Air and Gas Institute
CAL/OSHA	State of California Department of Industrial Relations, Division of Industrial Safety
CAL TRANS	California Department of Transportation
CBC	California Building Code
CBM	Certified Ballast Manufacturers
CBR	California Bearing Ratio
CEC	California Energy Code
CI	Chlorine Institute
CISPI	Cast Iron Soil Pipe Institute
CMAA	Crane Manufacturers Association of America
CPSC	Consumer Products Safety Commission
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards for the U.S. Department of Commerce
CTI	Cooling Tower Institute
DFPA	Douglas Fir Plywood Association
EIA	Electronic Industries Association
EPA	U.S. Environmental Protection Agency
ETL	Electronic Testing Laboratory
FM	Factory Mutual Insurance Company
FPS	Fluid Power Society
FS	Federal Specifications
GO 95	General Order No. 95, California Public Utilities Commission Rules for Overhead Electric Line Construction
GO 128	General Order No. 128, California Public Utilities Commission Rules for Underground Electrical Construction
HI	Hydraulic Institute
HMI	Hoist Manufacturers Institute
IAPMO	International Association of Plumbing and Mechanical Officials
IBC	International Building Code
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IFC	International Fire Code
IGCC	Insulating Glass Certification Council
IMC	International Mechanical Code
IPCE	International Power Cable Engineers Association
ISA	Instrument Society of America
NAAMM	National Association of Architectural Metal Manufacturers
NBS	National Bureau of Standards
NCPI	National Clay Pipe Institute
NEC	National Electric Code

<u>Abbreviation</u>	<u>Stands for</u>
NEMA	National Electrical Manufacturers Association
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NGVD	National Geodetic Vertical Datum
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
REA	Rural Electrification Administration
SAMA	Scientific Apparatus Makers Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Structural Steel Painting Council
TCA	Tile Council of America
UBC	Uniform Building Code
UFC	Uniform Fire Code
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USDC	U.S. Department of Commerce
UL	Underwriters Laboratories
WCLIB	West Coast Lumber Inspection Bureau
WIC	Woodwork Institute of California
WISHA	Washington Industrial Safety and Health Act, Chapter 49.17 of the Revised Code of Washington (RCW)
WQCB	Water Quality Control Board (Regional)
WRCB	Water Resources Control Board

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01040

COORDINATION AND PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 PROJECT COORDINATION

- A. Coordinate scheduling, submittals and work of various Sections of the Specifications and subcontractors to assure efficient and orderly sequence of interdependent construction. Coordinate construction scheduling with plant and utility shutdowns with requirements and limitations in Section 01010.

1.02 MECHANICAL AND ELECTRICAL/CONTROLS COORDINATION

- A. The Contractor's superintendent or a specially assigned assistant shall be designated the mechanical/electrical/controls coordinator and shall coordinate the exact location, space priorities and sequence of installation of all mechanical and electrical/controls work with each other and with all other trades. The mechanical/electrical/controls coordinator shall assure compliance with the requirements of this paragraph entitled "Mechanical and Electrical/Controls Coordination".
- B. The location of mechanical and electrical/controls work may be indicated diagrammatically on the Drawings. Actual locations shall follow locations shown on the Drawings as closely as practicable, but shall be altered or adjusted in the field by the mechanical/electrical/controls coordinator as required by the following:
 - 1. In finished spaces install mechanical and electrical/controls work concealed within the space available.
 - 2. Organize mechanical and electrical/controls work to make efficient use of space. Combine similar items into groups; make all runs parallel to or at right angles with building lines.
 - 3. Layout and install work to provide adequate space and access for adjustment, servicing, and maintenance and maximize space available for future installation of additional services or replacement of existing services.
 - 4. Assure that all access doors required by code or required for adjustment, servicing or maintenance are provided. Locate access doors to provide convenient access and to coordinate with finished visual elements.
 - 5. Coordinate location of fixtures, registers, grills, outlets, switches, panelboards, pullboxes, access doors, and other exposed mechanical and electrical items with functional and visual elements. Verify location of questionable items with Engineer before proceeding.
- C. Prepare large-scale coordinated detailed installation drawings showing the work of all affected trades to coordinate the actual installed location of all equipment and of all mechanical and electrical/controls work for all areas. Review coordination drawings with Engineer and all affected trades before proceeding.
- D. Review Shop Drawings and Product Data prior to submission for the Engineer's Review to assure that physical characteristics and service requirements are compatible with contract requirements, field conditions, and other items submitted.

- E. Verify that required services such as electrical power characteristics, control wiring, and utility requirements of items and equipment submitted and furnished are compatible with services provided. Notify Engineer of potential problems prior to ordering items or equipment and prior to installing services or completing construction in areas where services would have to be installed.
- F. Schedule installation sequence of various elements of mechanical and electrical/controls work to achieve optimum compliance with requirements under Mechanical and Electrical/Controls Coordination in this Section.
- G. Conduct regular weekly coordination meetings with affected trades and Engineer to establish and maintain coordination and resolve conflicts or disputes.

1.03 CUTTING, FITTING, AND PATCHING

- A. Provide cutting, fitting, or patching required to complete the Work and to make all of its parts fit together properly. Include cutting, fitting, and patching required to:
 - 1. Fit the several parts together and to integrate with other work.
 - 2. Uncover work to install or correct ill-timed work.
 - 3. Provide openings in elements of work for penetrations of mechanical and electrical work.
 - 4. Remove and replace defective and non-conforming work.
 - 5. Remove samples of installed work for testing.
- B. Request guidance from the Engineer prior to beginning cutting or altering construction, which affects:
 - 1. Structural integrity of any element.
 - 2. Functional performance of any element.
 - 3. Integrity of weather-exposed or moisture-resistant elements.
 - 4. Efficiency, maintenance, or safety of elements.
 - 5. Visual qualities of sight-exposed elements.
 - 6. Work by Owner or separate contractor.
- C. Execute cutting and patching using workers that specialize in and are skilled in installing the type of work being cut or patched.
- D. Perform work in accordance with the Contract Documents or in the absence of specific requirements comply with best trade practice for the work involved.
 - 1. Execute work by methods that will avoid damage to other work.
 - 2. Provide proper support and substrates to receive patching and finishing materials.
 - 3. Cut concrete materials using masonry saw or core drill. Locate all reinforcing steel, conduits and pipes with electronic detecting devices prior to cutting or core drilling existing concrete.
 - 4. Replace or patch work with new materials meeting the requirements of these specifications or if not specified matching materials and finishes of existing or adjacent work.
 - 5. Cut wall, ceiling and floor finishes to fit snugly around pipes, sleeves, ducts, conduit, and other penetrations. Provide fire and/or acoustical caulking as required by code or conditions of use.
 - 6. Maintain integrity of wall, ceiling, or floor construction; completely seal voids against smoke, fire and water.
 - 7. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

8. Report any hazardous or unsatisfactory conditions to the Engineer.

1.04 ALTERATION PROJECT PROCEDURES

- A. Plan, schedule and perform alteration work as required to minimize impacting the Owner's continued operations. See Section 01010 (01 11 00) paragraph titled "Contractor's Use of Site and Owner's Continued Operations."
- B. The existing **biosolids storage facility** must remain in operation during construction. Schedule utility interruptions, piping connections, and interruption of existing plant operations as required to permit continued compliance with regulatory requirements and to meet Owner's flow and processing requirements.
- C. Perform cutting, fitting, and patching in accordance with provisions in other paragraphs of this Section. Where new work abuts or aligns with existing work, perform a smooth even transition. When a smooth unnoticeable transition is not feasible cut existing surfaces along a straight line at a natural dividing point and provide a groove or cover plate as recommended by the Engineer.
- D. Provide new construction in accordance with the technical specifications or if not specified provide new construction matching adjacent or similar existing work in material and finish.

1.05 CONNECTIONS TO UNDERGROUND UTILITIES, CONDUITS, OR PROCESS PIPING

- A. Obtain best available current information on location, identification and marking of existing utilities, piping and conduits and other underground facilities before beginning any excavation. In areas where utilities participate in Underground Service Alert, call 1-800-642-2444 in Northern California. Give Engineer 48 hours notice before beginning work.
- B. The location of existing utilities and underground facilities known to the Design Engineer are shown in their approximate location based on information available at the time of preparing the Drawings. The actual location, size, type and number of utilities and underground facilities may differ from that shown and utilities or underground facilities may be present that are not shown.
- C. Use extreme care when excavating or working in areas that may contain existing utilities, process piping, conduits or other underground facilities. Use careful potholing, hand digging and probing to determine the exact location of underground installation. Some locations contain multiple pipes or conduits. Prior to performing any subsurface work, investigate, determine and prepare a plan to turn off or disconnect each utility believed to be in the within 100 feet of the subsurface work in the event of an accidental breach of a utility conduit.
- D. Where connections to existing utilities or other underground facilities is required or where new piping or conduits may cross or interfere with existing utilities or underground facilities, carefully excavate and uncover existing installations to a point 1 foot below the pipe or conduit to determine the actual elevation and alignment. Call the Engineer's attention to differing existing conditions that may require a clarification or change.

- E. Shutdown of existing utilities, services or operations shall be done in accordance with Section 01010.

1.06 PRECONSTRUCTION MEETING

- A. Prior to beginning the Work, the Contractor and its key personnel and Subcontractors including the Contractor's Superintendent, Project Manager, and Field Engineer shall attend a meeting with the Owner and the Engineer to discuss the following:
 - 1. Name, Authority, and Responsibilities of Parties Involved
 - 2. Project Procedures:
 - a. Progress meetings
 - b. Correspondence
 - c. Notification
 - d. Submittal of Product Data, Shop Drawing Samples, and Proposed Equivalents
 - e. Requests for Information
 - f. Response to Requests for Information
 - g. Requests for Quotation
 - h. Work Directive Change
 - i. Change Orders
 - j. Engineer's "Items of Concern List"
 - k. Application for Payment
 - 3. Temporary Schedule and Contractor's Construction Schedule
 - 4. Temporary Facilities and Control
 - 5. Testing During Construction
 - 6. Contractors Coordination
 - 7. Mechanical/Electrical Coordination
 - 8. Maintenance of Record Drawings
 - 9. Early Beneficial or Partial Occupancy
 - 10. Final Testing, Startup, and Balancing
 - 11. Punch Lists and Project Closeout Procedures
 - 12. Final Deliverables including Record Drawings, Operation and Maintenance Manuals, and Special Guarantees.

1.07 PROGRESS MEETINGS

- A. The Engineer will conduct weekly progress meetings with Contractor and Owner at job site. Attendance required by Contractor's project manager, superintendent and affected Subcontractors and suppliers. The Engineer will prepare, maintain, and distribute agenda and dated record of: (1) actions required and taken and (2) decisions needed and made.
- B. Agenda:
 - 1. Review critical items/action list.
 - 2. Review work progress. Compare actual progress with planned progress shown on Contractor's rolling three-week and overall schedule. Discuss corrective action required. Compare actual and projected progress with Contractor's CPM Construction Schedule, propose methods to correct deficiencies.
 - 3. Review status of Submittals; review delivery dates and delivery dates for critical items.
 - 4. Review coordination problems.

5. Schedule needed testing and critical inspections.
6. Review critical requirements for each trade or major piece of equipment prior to beginning work or installation.
7. Discuss Contractor Quality Control.
8. Discuss open items on Engineer's "Items of Concern List."
9. Discuss impact of proposed changes on progress Schedule.
10. Other business.

1.08 PERFORMANCE SPECIFICATIONS AND CONTRACTOR DESIGNED WORK

- A. Work under this Contract may be specified by a combination of descriptive, performance, reference standard and proprietary specifications. In the event of conflict between any of the various specification methods used to specify a single item the order of precedence shall be the order in which the methods are listed in the preceding sentence. The terms used to describe types of Specifications are taken from the Construction Specification Institute (CSI) Handbook of Practice.
- B. Where Specifications are used to define the characteristics of Contractor designed systems, items or components, the Contractor shall be fully responsible to design, engineer, manufacture, and install the systems, items and components to meet the specified functional requirements, performance requirements, quality standards, durability standards and conditions of use as well as all applicable codes, regulations and referenced trade or industry standards. The Contractor shall perform such design by employing engineers licensed in the State in which the Work is being constructed. The Contractor's design submittals shall include calculations and assumptions on which the design is based and shall be stamped and signed by appropriately licensed engineers.
- C. In accordance with General Conditions paragraph 8.13 OR Where performance-type specifications are used or where pre-engineered or Contractor-designed systems, elements, equipment or components are called for, the Owner and the Engineer shall have the right to rely on the expertise and professional competence of the Contractor's design. Favorable review of the Contractor's design submittal shall not relieve the Contractor from full responsibility for the adequacy of the Contractor's design.

1.09 MATERIAL AND EQUIPMENT

- A. General:
 1. Verify that products delivered meet requirements of Contract Documents and the requirements for Favorably Reviewed submittals.
- B. Compatibility of Equipment and Material:
 1. Similar items, equipment, devices or products furnished under a single specification section shall all be made by the same maker and have interchangeable parts.
 2. In addition, but only if so stated in each affected Specification Section, similar items furnished under two or more Specification Sections shall be made by the same maker and have interchangeable parts.
 3. All similar materials or products that are interrelated or used together in an assembly shall be compatible with each other.
- C. Transportation and Handling:

1. Transport and handle products in accordance with manufacturer's instructions.
 2. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
 3. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- D. Storage and Protection:
1. Store and protect products in accordance with manufacturer's instructions. Seals and labels shall be intact and legible.
 2. Store moisture-sensitive products including finish woodwork, gypsum products, acoustical products, motors, electrical equipment, instruments and controls in weather-tight, humidity- and temperature-controlled enclosures.
 3. For exterior storage of fabricated products, place items on sloped supports, aboveground.
 4. Cover products subject to deterioration from moisture, dust, or sunlight with opaque watertight but breathable sheet covering. Provide ventilation to avoid condensation.
 5. Provide offsite storage and protection including insurance coverage when site does not permit onsite storage or protection.
 6. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
 7. Provide facilities, equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
 8. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
- E. Installation Standards and Manufacturers' Recommendations:
1. Install all products and materials in strict compliance with the most restrictive of the following:
 - a. The manufacturer's or provider's written instructions or recommendations. Follow step-by-step installation procedures.
 - b. Recommendations of referenced trade associations or standards.
 - c. The Contract Specifications and Drawings.
 2. Where conflicts exist, present alternatives with advantages and disadvantages to Engineer for decision.
- F. If reference standards or manufacturer's instructions contain provisions that would alter or are at variance with relationships between the parties to the Contract set forth in the Contract Documents, the provisions in the Contract Documents shall take precedence.

1.10 BACKING, SUPPORTS AND FASTENERS

- A. Provide backing, supports, bracing, fasteners and other provisions required for the proper support and attachment of all work. Backing, supports, bracing and fasteners shall be sized to resist vertical and horizontal loads including seismic and wind loads required by codes listed under Regulatory Requirements in Section 01010 and in accordance with Seismic Design Requirements in Section 01190. Where finishes in existing facilities must be removed to install backing or where finishes are installed in new construction prior to installing backing the Contractor shall remove finishes, install backing and reinstall finishes.

1.11 SAFETY

- A. In accordance with generally accepted construction practice, applicable law and the General Conditions, the Contractor shall be solely and exclusively responsible for and have control over:
 - 1. Construction means, methods, techniques, sequences, procedures and for coordinating all portions of the Work under the Contract Documents.
 - 2. Safety of employees engaged in the work while on and off the site.
 - 3. Safety of the Owner, the Engineer, the Design Engineer, and others who may visit or be affected by the work.
 - 4. Safety of the work itself including material and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's subcontractors or sub-subcontractors.
 - 5. Safety of other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction.
 - 6. Safety programs, equipment and protective devices required to assure the safety of persons and property for whom/which the Contractor is responsible.
- B. The Owner, the Engineer, and the Design Engineer and each of their officers, employees, agents and consultants shall not be responsible for any construction means, methods, techniques, sequences, nor for safety in, on or about the site, nor for coordinating any part of the Work.
- C. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.
- D. The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, necessary fences and other safeguards for safety and protection of persons and property on and off the site and shall: (1) post danger signs and other warnings against hazards, (2) promulgate safety regulations, and (3) notify owners and users of adjacent sites and utilities when the Contractor's operations may affect them.
- E. The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated by the Contractor in writing to the Owner and Engineer.
- F. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs required in connection with the Work and shall send copies of all accident, injury or work-related illness reports and of all notices of unsafe conditions to the Engineer.
- G. The Contractor shall not load or permit heavy weights to be placed on any part of the construction or site so as to endanger its safety.
- H. The duties of the Owner, the Engineer and the Design Engineer in conducting review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's work methods, equipment, bracing, scaffolding or safety measures in, on, or near the construction site.

- I. The Contractor is hereby informed that work on this project could be hazardous. The Contractor shall carefully instruct all personnel working in potentially hazardous work areas as to potential dangers and shall provide such necessary safety equipment and instructions as required to prevent injury to personnel and damage to property, and to comply with all applicable laws and regulations including State OSHA, Federal OSHA, and other regulations referenced in these Contract Documents.
- J. The Contractor shall, at all times, maintain the job in a condition that is safe for the Owner, the Engineer and their consultants to make site visits and to conduct construction reviews. If the Owner or the Engineer cannot allow personnel to visit the job because it is not safe, the Contractor is not providing required safe access to the Work.
- K. The Contractor shall prepare a Safety Plan meeting the requirements of applicable regulations. As a minimum, the Contractor's Safety Plan shall set forth definite procedures for informing workers about safety, for instructing workers in safe practices, for assuring that workers are using appropriate safety equipment and safe work practices and for reporting accidents.

1.12 CONTRACTOR'S QUALITY CONTROL

- A. The Contractor shall be fully responsible for inspecting the work of its suppliers and subcontractors to assure that the work when completed will comply with the standards for materials and workmanship required by the Contract Documents.
- B. Inspections, periodic observations and testing performed by the Owner or the Engineer are for the Owner's benefit and information only and shall not be construed as partial or incremental acceptance of the work and shall not be deemed to establish any duty on the part of the Owner or the Engineer to the Contractor, its subcontractors or suppliers.
- C. The Contractor shall:
 - 1. Monitor quality control over suppliers, manufacturer, products, services, site conditions, and workmanship, to produce work of specified quality.
 - 2. Comply fully with manufacturer's installation instructions, including performing each step in sequence as recommended by the manufacturer.
 - 3. Submit a Request for Information (RFI) to the Engineer before proceeding with work when manufacturers' instructions or reference standards conflict with Contract Documents.
 - 4. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
 - 5. Perform work by persons specializing in the specific trade and class of work required and qualified to produce workmanship of specified quality.
 - 6. Secure products in place with positive anchorage devices designed and sized to withstand seismic, static and dynamic loading, vibration, and physical distortion or disfigurement.
- D. If reference standards or manufacturers' instructions contain provisions that would alter or are at variance with relationships between the parties to the Contract set forth in the Contract Documents, the provisions in the Contract Documents shall take precedence.

- E. The Contractor shall provide assistance required by the Engineer to adequately inspect the Work including ladders, scaffolding, lighting, ventilation and other aids to facilitate access and provide a safe working environment.

1.13 TESTING LABORATORY SERVICES AND CERTIFIED LABORATORY REPORTS

- A. Provide testing services in accordance with General Conditions and specific requirements contained in each technical specification section. Submit Certified Laboratory Reports required by technical specification sections.
- B. Unless otherwise specified, the Contractor shall arrange and pay for tests, inspections and approvals other than Special Inspections that are required by laws, ordinances, rules, regulations, orders of public authorities having jurisdiction or by the Contract Documents. All such tests, inspections and approvals shall be performed by an independent testing laboratory or inspection agency acceptable to the Engineer or to the appropriate public authority. Samples to be tested and items of work to be inspected will be selected by the Engineer or the public authority requiring the test or inspection. Test reports, inspection reports and certificates shall be submitted directly to the Engineer by the performing laboratory or agency. The Contractor shall notify the Engineer at least two (2) days prior to all tests and inspections to permit observation by the Engineer.
- C. The Contractor shall provide access for Special Inspections and notify the Owner two (2) working days in advance of when work requires Special Inspection.

PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 SUBMITTAL PROCEDURES

- A. Accompany each submittal with a Submittal form that contains the following information:
 - 1. Contractor's name and the name of Subcontractor or supplier who prepared the submittal.
 - 2. The project name and identifying number.
 - 3. Description of the submittal and reference to the Contract requirement or technical specification section and paragraph number being addressed.
 - 4. Submittal identification number. Include alphabetic suffix indicating resubmittal (e.g. submittal number 11.A to indicate first resubmission of Submittal No. 11)
- B. Unless otherwise specified, provide submittals in electronic PDF searchable format.
- C. Submittals which include more than one (1) item or piece of equipment shall include a Table of Contents following the standard submittal form and cover sheets
- D. Each submittal shall include a copy of the specification section and all referenced and applicable sections with addendum updates included. For each specification section, check-mark each paragraph to indicate specification compliance with the full paragraph as a whole or marked to indicate requested deviations from specification requirements. Each deviation from the specifications requested by the Contractor shall be underlined and referenced by a unique number in the margin to the right of the identified paragraph. The submittal shall include a detailed written explanation of the reasons for requesting the deviation that is clearly labeled to correspond with the unique number provided in the margin. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal on the basis that the submittal is incomplete and will be returned to the Contractor REJECTED – RESUBMIT with no further consideration.
- E. Project Initiation Submittals. At a minimum, provide the following project initiation submittals prior to mobilization.
 - 1. Designation of Superintendent: Include name, address, home telephone number and a brief resume.
 - 2. List of Subcontractors and Major Suppliers: Include address, telephone number and name of responsible party.
 - 3. Schedule of Values, in a form acceptable to the Engineer

1.02 SCHEDULE OF SUBMITTALS

- A. Within fifteen (15) days after the Notice to Proceed, submit a Schedule of Submittals showing the date by which each submittal required for Product Review or Product Information will be made. Identify the items that will be included in each submittal by listing the item or group of items and the Specification Section and paragraph number under which they are specified. Indicate whether the submittal is required for Product Review of Proposed Equivalents, Shop Drawings, Product Data or Samples or required for Product Information only.

1.03 PLAN OF OPERATIONS

- A. Before beginning on site work, submit a plan showing Contractor's intended use of the site assigned to it. Show location of enclosing fence, access points and gates. Show location for Contractor's, Subcontractor's, and Engineer's field office and parking. Show location of Contractor's and Subcontractor's work areas and storage areas.

1.04 SHOP DRAWING, PRODUCT DATA AND SAMPLES SUBMITTED FOR PRODUCT REVIEW

- A. This paragraph covers submittal of Shop Drawings, Product Data and Samples required for the Engineer's review referred to as Product Review submittals in the Technical Specifications (Divisions 2 through 17).
- B. The Contractor shall make all Product Review submittals early enough to allow adequate time for the Engineer's review, for manufacture and for delivery at the construction site without causing delay to the Work. Submittals shall be made early enough to allow for unforeseen delays such as:
 - 1. Failure to obtain Favorable Review because of inadequate or incomplete submittal or because the item submitted does not meet the requirements of the Contract Documents.
 - 2. Delays in manufacture.
 - 3. Delays in delivery.
- C. Content of Submittals:
 - 1. Each submittal shall include all of the items and material required for a complete assembly, system or Specification Section.
 - 2. Submittals shall contain all of the physical, technical and performance data required by the specifications or necessary to demonstrate conclusively that the items comply with the requirements of the Contract Documents.
 - 3. Include information on characteristics of electrical or utility service required and verification that requirements have been coordinated with services provided by the Work and by other interconnected elements of the Work.
 - 4. Provide verification that the physical characteristics of items submitted, including size, configuration, clearances, mounting points, utility connection points and service access points, are suitable for the space provided and are compatible with other interrelated items that are existing or have or will be submitted.
 - 5. Label each Product Data Submittal, Shop Drawing and Sample with the information required in paragraph 1.01A of this Section. Highlight or mark every page of every copy of all Product Data submittals to show the specific items being submitted and all options included or choices offered.

6. Additional requirements for Product Review submittals are contained in the Technical Specification sections.
 7. Designation of work as "NIC" or "by others," shown on Shop Drawings, shall mean that the work will be the responsibility of the Contractor rather than the subcontractor or supplier who has prepared the Shop Drawings.
- D. Compatibility of Equipment and Material: Verify that items contained in the same or in different submittals meet the requirements in the paragraph titled "Material and Equipment" in Section 01040 especially the subparagraphs titled "Compatibility of Material and Equipment."
- E. Contractor shall review and approve all subcontractor submittals prior to submitting to Engineer for review and approval.
- F. Submittals that contain deviations from the requirements of the Contract Documents shall be accompanied by a separate letter explaining the deviations. The Contractor's letter shall:
1. Describe the deviation from the specifications requested and identify with a unique number and reference to the Specification Section paragraph or Drawing requirement. The letter shall include a detailed written explanation of the reasons for requesting the deviation that is clearly labeled to correspond with the unique number provided.
 2. Describe the proposed alternate material, item or construction and explain its advantages and/or disadvantages to the Owner.
 3. State the reduction in Contract Price if any that is offered to the Owner.
- G. Engineer's Review Procedure and Meaning:
1. The Engineer will stamp and mark each Product Review submittal prior to returning it to the Contractor. The stamp will indicate whether or not the review was favorable and what action is required of the Contractor. Review categories "No Exceptions Taken" and "Make Corrections Noted" both indicate Favorable Review.
 2. At a minimum, Favorable Review is contingent on:
 - a. The compatibility of items included in a submittal with other related or interdependent items included in previous or future submittals.
 - b. Future submittal of items related to or required to be part of this submittal that were not included with this submittal.
 3. Favorable Review of a submittal does not constitute approval or deletion of items required as part of the submittal but not included with the submittal. Favorable Review of items included in the submittal does not constitute deletion of specified features, options or accessories that were not included in the submittal.
 4. The action required by the Contractor for each category of review is as follows:
 - a. **NO EXCEPTIONS TAKEN.** NO RESUBMITTAL REQUIRED.
 - b. **MAKE CORRECTIONS NOTED:**
 - 1) **NO RESUBMITTAL REQUIRED.** The Contractor shall make corrections noted prior to manufacture.
 - 2) **PARTIAL RESUBMITTALS REQUIRED.** The Contractor shall submit related accessory or optional items as noted which are required but were not included with the submittal and/or shall resubmit unsatisfactory portions or attributes of items as noted.

The Contractor may proceed to manufacture those portions of the submittal that will be unaffected by required resubmittals.

- c. **AMEND AND RESUBMIT**. The Contractor shall amend and resubmit the submittal as noted or required to comply with the Contract Documents.
 - d. **REJECTED - RESUBMIT**. The item submitted does not comply with the Contract Documents. Resubmit items that comply with the requirements of the Contract Documents.
 - e. **NOT REVIEWED**. The item submitted is incomplete or does not comply with the Contract Documents. The item has not been reviewed and is returned to the Contractor for correction.
 - f. **RECEIPT ACKNOWLEDGED**. Receipt of a submittal that is not subject to the Owner's review and approval is acknowledged; and, is being filed for information purposes only. Generally used in acknowledging receipt of Product Information. No further submittal activity is required by the Contractor.
5. The letter of transmittal accompanying the returned Product Review submittal may contain numbered notes. Marking a corresponding number on a Shop Drawing or Product Data submittal shall have the same affect as applying the entire note to the submittal.
- H. Re-submittals that contain changes that were not requested by the Engineer on the previous submittal shall be accompanied by a letter explaining the change.
- I. Favorable Review Required Prior to Proceeding: Do not proceed with manufacture, fabrication, delivery or installation of items prior to obtaining the Engineers Favorable Review of Product Review submittals.
- J. Intent and Limitation on Engineer's Review:
- 1. The Contractor has primary responsibility for submitting and providing work that complies with the requirements of the Contract Documents. That responsibility cannot be delegated in whole or in part to subcontractors or suppliers. Neither the Engineer's Favorable Review nor the Engineer's failure to notice or comment on deficiencies in the Contractor's submittals shall relieve the Contractor from the duty to provide work, which complies with the requirements of the Contract Documents.

1.05 PROPOSED EQUIVALENTS (SUBSTITUTIONS)

- A. Submit documents demonstrating equivalency to specified products and comply with the submittal requirements for Shop Drawings, Product Data, and Samples submitted for Product Review in another paragraph of this Section.
- B. Content of submittals shall be the same as that required for Product Data, Shop Drawings and Samples submitted for Product Review in another paragraph of this Section. In addition, the Contractor shall provide information on several recent similar installations of the item to verify its suitability. The information shall include the project name and location, the Owner's name, address, telephone number and name of a knowledgeable person to contact for information on performance of the product.
- C. When the Contractor has listed specific maker's products submitted with its Bid, no changes will be permitted without submittal of acceptable evidence justifying the change and the Engineer's written approval.

- D. If a non-equivalent substitute is submitted for review, it shall be accompanied by a proposed reduction in Contract Price which shall include the increased cost of Engineering service required to evaluate the proposed substitute (which shall be paid to the Owner whether or not the substitute is accepted) plus the greater of 1) the difference in price between the first specified item and the item submitted and 2) the difference in value to the Owner between the two items.

1.06 PRODUCT INFORMATION SUBMITTALS

- A. Submittal for Informational Purpose Only is an item required for the Owner's permanent records relating, in part, to future maintenance, repair, modification, replacement of work or as otherwise required. Submittals for Informational Purpose Only will only be received and logged to document that the required submittals have been made. Neither the Owner nor Engineer will respond to a Submittal for Informational Purpose Only.
- B. The Contractor shall clearly separate information for Product Review from information for Product Information in submittals that include both.
- C. Make Product Information submittals prior to delivering material, products or items for which Product Information submittals are required.
- D. The Contractor has the sole and exclusive responsibility for furnishing products and work that meets the requirements of the Contract Documents.
- E. The Engineer reserves the right to comment on any submittal and to reject any product or work delivered, installed or otherwise at any time that the Engineer become aware that it is defective or does not meet the requirements of the Contract Document.

1.07 OPERATION AND MAINTENANCE MANUALS AND PARTS LISTS

- A. Operation and maintenance (O&M) information shall be submitted in a format best suited for the type of manual to be provided to the Owner. Unless otherwise specified, provide information in electronic PDF searchable format.
- B. Provide operation and maintenance manuals and parts list for all equipment furnished under this Contract. Comply with the detailed requirements in Technical Specification sections. Include instructions for delivery, storage, assembly, installation, lubrication, adjusting, startup, operation and maintenance. Provide PDF bookmarks for all items listed in subparagraphs 1 through 5 below.
 - 1. For all equipment include:
 - a. Startup instructions
 - b. Normal operation instructions.
 - c. Trouble shooting instructions.
 - d. Lubrication instructions.
 - e. Maintenance and reinstallation instructions, and manufacturer's recommended preventative maintenance schedule.
 - f. Parts identification.
 - g. List of spare parts recommended to have on hand.
 - h. Operator safety instructions.
 - i. Cleaning instructions.
 - j. Theory of operation to discrete component level.

- k. Schematic diagrams, flow diagrams, wiring diagrams, logic diagrams, etc. to discrete component level.
 - l. Parts list showing all discrete components with part number,
 - m. Manufacturers' service and maintenance technical manuals.
 - 2. For all Electrical Equipment, provide the following additional information:
 - a. Equipment ratings.
 - b. Calibration curves and rating tables if appropriate.
 - 3. For Complex Equipment provide in addition:
 - a. Alternate specified operating modes.
 - b. Emergency shutdown instructions.
 - c. Normal shutdown instructions.
 - d. Long-term shutdown instructions.
 - 4. Operation and maintenance manuals for systems composed of separate pieces of equipment shall include a system explanation of items 1, a, b, and c, and 3a through c, as well as the instructions for each separate piece of equipment.
- C. Submit at least fifteen (15) days prior to Facility Startup and Training specified in Section 01650.
- D. When standard manufacturer's literature is used highlight or mark all copies to shop specific items and options provided.

1.08 MANUFACTURER'S CERTIFICATES

- A. When specified in Technical Specification section, submit manufacturers' certificate to Engineer for review. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate. Certificates may be recent or previous test results on material or product, but must be acceptable to the Engineer.

1.09 CONSTRUCTION PHOTOGRAPHS

- A. Submit digital photographs in electronic JPEG format each month to Engineer with Application for Payment.
- B. Identify photographs with date, time, orientation and project identification.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 TEMPORARY UTILITIES

- A. Sanitary Facilities: Provide and maintain self-contained portable sanitary facilities for the Contractor's and subcontractor's use. Facilities shall comply with applicable regulations and shall be serviced, cleaned and disinfected frequently.
- B. Temporary Water, Power and Telephone Service: Provide all temporary utility services required for the project. Pay all utility service connection and use charges.
- C. Temporary Lighting: Provide and maintain lighting for construction operations to achieve a minimum lighting level of 20 foot-candles for rough work and 60 foot-candles for finish work.
- D. Temporary Fire Protection:
 - 1. Provide and maintain fire protection equipment, including extinguishers, fire hoses, and other equipment required by law or insurance carriers, or as necessary for proper fire protection during the course of the work.
 - 2. Use fire protection equipment only for fighting fires.
 - 3. Locate fire extinguishers in field offices, storage sheds, tool houses, temporary buildings, and throughout the construction site.

1.02 TEMPORARY CONSTRUCTION

- A. The Contractor is solely and exclusively responsible for the design, construction and maintenance of all temporary construction including forms, falsework, shoring, scaffolding, stairs, ladders and all other similar items.
- B. Construct adequate and safe forms and falsework to rigidly support partially completed structures. Provide temporary bridges and decking to maintain vehicular and pedestrian access. Design and construct temporary forms, falsework, bridges and decking in accordance with applicable regulations and codes.

1.03 BARRICADES, FENCES AND ENCLOSURES

- A. Barricades: Provide temporary guardrails, ladders, stairs, guards, and barricades to protect persons in accordance with applicable regulations.
- B. Fences:
 - 1. Existing fences enclose the present facilities site. The fences are for the protection and security of the present operating facilities. Contractor shall coordinate site access and security with City staff. Contractor shall be responsible for securing project site at the conclusion of work, each day workers are onsite.
- C. Enclosures:
 - 1. Provide protective dust covering at doors and other openings to contain dust within the construction area.

2. Provide temporary partitions to prevent dust and moisture from entering Owner-occupied areas and to prevent damage to existing materials and equipment. Temporary partitions shall be of non-combustible construction such as metal studs and gypsum board.
3. Provide temporary watertight closures for openings in exterior surfaces as required to protect interiors from weather, moisture, humidity and extreme temperature.

1.04 PROTECTION OF INSTALLED WORK

- A. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
- B. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is unavoidable, provide adequate protection to prevent damage to waterproof membranes and comply with recommendations for protection of the waterproofing or roofing material manufacturer.
- C. Provide heavy planking to protect curbs, gutters, culverts, paving and similar surfaces from damage by heavy equipment or vehicles.

1.05 SECURITY

- A. Provide security and facilities to protect the Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.06 ACCESS ROADS AND PARKING AREAS

- A. Access Roads: use only access roads designated on the Drawings.
- B. Parking:
 1. Contractor may use existing paved areas for employee parking and equipment storage during the course of the work. Access to parking areas must be coordinated with City staff to allow continuity of operations during construction.

1.07 TEMPORARY CONTROLS

- A. Cleaning:
 1. During Construction: Maintain the site and all work in a clean orderly fashion free of waste debris and rubbish. Store debris in covered containers. Pick up and remove debris daily if required, but not less frequently than weekly. Burning debris on site is not permitted. Remove debris from permanently closed spaces prior to enclosing them. Clean mud from vehicles before leaving the site.
 2. If work under this Contract creates dusty, dirty or unsightly conditions in adjacent areas, the Contractor shall immediately cleanup the affected areas.
 3. Final cleanup is specified in Section 01700.
- B. Dust Control: Employ measures to prevent the creation of dust which may produce damage or nuisance to property or persons. Be responsible for all damage resulting from dust produced by construction operations. Periodically wet down unpaved areas where vehicles are operated.

- C. Erosion and Sediment Control: Employ measures to prevent erosion and trap any sediment created by construction operations before it leaves the site. Prevent sediment from entering streams or other water bodies.
- D. Water Control: Maintain excavations free of water. Protect site from puddling or running water.

1.08 PROTECTION OF TREES

- A. Remove only those trees designated on the Drawings for removal. Protect all other trees on the site.
- B. Protect all trees to remain on the site from damage. Do not cut roots larger than 2 inches in diameter during excavating or trenching operations.
- C. Do not attach ropes, cables, guys or braces to trees designated to be preserved.
- D. Do not trim any trees without the Engineer's authorization.

1.09 TRAFFIC REGULATION

- A. Conduct operations so as to offer the least possible obstruction and inconvenience to public traffic. Do not overload or damage paved or improved surfaces, sidewalks, curbs or gutters.
- B. Provide temporary barricades, lights, flag persons and other means to safely control pedestrian and vehicular traffic entering and leaving the project site and on the project site.

PART 2 - PART 2 - PRODUCTS (NOT USED)

PART 3 - PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01650

FACILITY STARTUP

PART 1 - GENERAL

1.01 EQUIPMENT AND FACILITY STARTUP

- A. Commission all systems and equipment to verify performance, function, and correct operation by performing procedures to activate, startup, adjust, test, and demonstrate that the work is in operating order in accordance with the general requirements of this Section and the detailed requirements of the technical sections under the system or equipment specified. To ensure that the work is ready for full-time operation, the procedures shall include verification, balancing, calibration, witness testing, documentation, inspection by equipment manufacturers and operator training where specified.
- B. Notification: Notify the Engineer five (5) days prior to starting each system or piece of equipment.
- C. Coordination: During the startup period, coordinate the operation of the equipment with Engineer, subcontractors, Owner's operators, and manufacturer's representatives.
- D. Furnish test equipment, measuring devices and supplies required to conduct tests.
- E. Maintain the equipment until acceptance. Provide all lubricants, chemicals, and electricity necessary until acceptance.
- F. Furnish all expendable supplies, gas, water, etc., required for startup, demonstration and testing and dispose of all waste or used supplies, water, etc.
- G. Favorably reviewed Operations and Maintenance (O&M) Manuals are required twenty (20) days before the startup of new equipment/facilities.

1.02 SUBMITTALS

- A. Startup Plan, Forms, and Schedule: Prepare a facility startup plan and schedule. The plan shall include test methods and procedures and sample forms for recording test data.
- B. Submit documentation of tests

1.03 INITIAL STARTUP AND OPERATION OF FACILITIES

- A. The following listing is a general sequence of startup activity steps to be used in placing facility systems into operation:
 - 1. Perform initial lubrication of equipment (if applicable) and have manufacturers check and adjust equipment. Provide all subsequent lubrication and maintenance, and such staff as required for test operation until the Owner assumes equipment maintenance responsibility after Step 15 below.
 - 2. Perform satisfactory testing of electrical work required prior to energizing of the electrical system.
 - 3. After completion of Step 2, perform satisfactory electrical testing required after energizing of the electrical system.

4. Complete calibration of instruments.
5. Satisfactorily complete system verification of instrumentation work.
6. After completion of Steps 1 and 3, perform a rotational test of equipment and correct backward rotating drives.
7. After completion of Steps 5 and 6, test operate the equipment by manually initiating the operation. Where manual operation bypasses alarm or safety monitoring, provide continuous supervision of such parameters. Perform this step using water in lieu of chemicals or other process liquids. Use dry air or nitrogen in lieu of hazardous gases. Following testing with water, chemical lines shall be drained and be fully dried, in accordance with the specifications, prior to introduction of chemical.
8. Concurrent with Step 7, perform instrumentation and control testing and adjustments as related to the equipment being tested. Concurrent with Step 7 and where possible at this stage of startup, complete the performance testing specified for the equipment.
9. Concurrent with Step 7, perform adjustments of the electrical work as related to the equipment being tested.
10. Repeat Steps 1 through 10 as required for other equipment items and plant systems until all plant process components and utility systems are ready for new system(s) operation. It may be necessary for the Contractor to put portions of the newly constructed facility in service before constructing other portions of the facility or completing the Work as a whole.
11. Submit the required documentation of testing, calibration, and equipment affidavits.
12. Notify the Owner and the Engineer twenty (20) calendar days before new system(s) operation is to occur so that the Owner may make other arrangements for full-time operation. This notification shall have an accuracy of plus or minus seven (7) days. Notify the Owner and Engineer again, exactly seven (7) days before total plant operation is to begin.
13. 30-Day Plant Startup and Initial Operation Period: Upon completion of all the above steps, the new system(s) shall be started up and operated on a complete full-time basis beginning on the indicated date. The Owner will provide operating personnel, chemicals and untreated water. The Contractor shall also furnish all such mechanical and electrical workers as required to make adjustments to and perform all required maintenance for the operating equipment until the end of the 30-day initial operation period. Maintenance of operating equipment shall include lubrication, adjustments, replacements, and modifications as required.
14. After successful completion of the 30-day initial operation period, the Owner will take over maintenance duties as well as operation and will begin to provide and pay for expendables. If continuous process operation is interrupted for a period of four (4) consecutive hours or more due to a failure of the equipment or work provided by the Contractor, then the counting of the 5-day and/or 30-day periods, described in Step 14 above, shall be restarted at day one if these periods have not reached satisfactory completion.
15. Following the commencement of Step 14, satisfactorily complete equipment performance testing, electrical testing and adjustments, and instrumentation/control testing and adjustments to the extent that such testing and adjustments could not be made prior to full plant OR system operation.
16. Submit any remaining documentation of testing, balancing reports, equipment affidavits and the like commissioning before acceptance.

1.04 MANUFACTURER'S FIELD SERVICE AND AFFIDAVITS

- A. Field Service: Where specified, manufacturers of equipment shall provide field service. Field service shall be provided by an authorized factory-trained and qualified manufacturer's representative for the specific equipment. Equipment shall not be considered ready for full-time operation until after the manufacturer's representative has checked and adjusted the equipment, and certified by written affidavit that the equipment has been properly installed, tested, adjusted, lubricated, and calibrated, and is ready for full-time operation.
- B. Affidavits: Acceptable affidavits shall be submitted prior to the 30-Day Acceptance Test.
 - 1. Affidavits shall contain the following specific wording:
"The insert name of equipment has been properly installed, tested, adjusted, lubricated, and calibrated, and is ready for full-time operation. The installation has been inspected and has been found to be in conformance with our (the manufacturer's) standards and requirements."
 - 2. Except for insertion of the equipment name, no amplification, dilution, or modification of this specific wording will be permitted.

1.05 TRAINING

- A. Submit Operation and Maintenance Manuals and Parts Lists specified in Section 01300 at least fifteen (15) days prior to the first training session.
- B. Demonstrate the operation, maintenance and safety procedures for all systems and equipment to personnel designated by the Owner.
- C. In addition to overall training specified above, provide special demonstration and training for specific pieces of equipment specified in the Technical Specification Sections.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 FINAL CLEANUP

- A. Prior to Final Inspection, the Contractor shall clean the entire construction area and all other areas affected by the performance of work under this Contract. Perform cleaning using personnel specializing in and skilled in cleaning and maintenance work. Perform repair work using personnel skilled in executing the type of work being repaired.
 - 1. Remove all temporary construction, signs, tools, equipment, excess material and debris.
 - 2. Remove all lumps, splatters, spots and stains caused by paint, adhesive, asphalt, concrete, mortar, sealant or other foreign material from exposed or finished surfaces. Remove all temporary labels.
 - 3. Repair, patch or replace new or existing work including pavement, sidewalks, curbs, gutters, catch basins, gratings, manholes, covers, landscaping, plant materials and other items that have been damaged, broken, cracked or chipped as a result of performing this Work.
 - 4. Sweep clean and wash down all exterior pavement surfaces. Remove all hazardous material and material that may cause sediment in drainage systems prior to washdown. Remove all grease and oil stains on pavement caused by Contractor's equipment.

1.02 CONTRACTOR'S ACTION LIST OF ITEMS TO BE CORRECTED AND/OR COMPLETED

- A. During construction, the Contractor shall maintain an action list of items to be corrected and/or completed. Regularly add items and update the list as information becomes available or as requested by the Engineer. Deliver a current copy of the list to the Engineer at each progress meeting.

1.03 SEMIFINAL INSPECTION/SUBSTANTIAL COMPLETION

- A. When the Contractor considers the Work nearly complete, the Contractor shall review the Contract Documents, inspect the Work, and use the Contractor's action list to prepare a Contractor's Punch List of all deficient or uncompleted items. Complete or correct the items on the Punch List. When the Work is Substantially Complete in accordance with the agreement, notify the Engineer in writing that the Contractor has reviewed the Contract Documents, inspected the Work and believes that the Work is Substantially Complete and ready for Semifinal Inspection.
- B. On receipt of the Contractor's Punch List and notice that the work is ready for Semifinal Inspection, the Engineer will inspect the Work. The Engineer may add additional items to the Contractor's Punch List, may find that the Work is not ready for inspection, may find that the Work is ready for inspection but not Substantially Complete or may find that the Work is Substantially Complete. When the Engineer finds the Work is Substantially Complete, he/she will prepare a Final Punch List

and a notice of Substantial Complete, which will state the date of Substantial Completion and the time agreed to by the Owner and the Contractor (not to exceed 30 calendar days) in which the Work shall be fully complete and ready for Final Inspection.

1.04 FINAL INSPECTION, FINAL COMPLETION AND FINAL PAYMENT

- A. When the Contractor has completed or corrected all the items on the Engineer's Final Punch List, the Contractor shall give the Engineer written notice that the Work is ready for Final Inspection. When the Engineer finds the Work acceptable and fully complete in accordance with the Contract Documents, and upon receipt of a final Application for Payment and all final submittals, the Engineer will recommend that the Owner issue a Notice of Final Completion, make Final Payment and Accept the Work stating that to the best of the Engineer's knowledge, information and belief, and on the basis of the Engineer's observations and inspection, the Work has been fully completed in accordance with the terms and conditions of the Contract Documents.
- B. Final Submittals include:
 - 1. Operation and Maintenance Manuals and Parts Lists
 - 2. Record Drawings
 - 3. Extra Materials
 - 4. Special Guarantees
 - 5. Insurance Certificate showing required continuation of coverage beyond Final Payment.
 - 6. Release of Liens.
 - 7. Waiver of Claims by Contractor.
 - 8. And any other submittals required by the Contract Documents and not previously received.
- C. The Owner will record the Notice of Final Completion at the County Recorders Office.

1.05 RECORD DRAWINGS

- A. The Contractor shall maintain on the jobsite, a complete set of Contract Documents and a complete file of all addenda, contract modifications and favorably reviewed submittals. The Contractor shall prepare a set of Record Drawings concurrently with the construction of the Work.
 - 1. Show the horizontal location of underground utilities measured from permanent visible physical features such as face of building, face of tank, or centerline of manhole.
 - 2. Comply with detailed requirements in technical specification sections describing the type of information required on Record Drawings. The Contractor's copy of Contract Documents, Contract modifications and Record Drawings shall be available to the Engineer for weekly verification that the records are being currently updated.
- B. Submit Record Drawings and obtain acceptance prior to completion.

1.06 EXTRA MATERIALS

- A. Deliver specified extra materials and parts to Engineer. Itemize all items on a transmittal letter in duplicate and obtain signature of receiving party. Submit copies of signed transmittals for all specified extra materials and parts prior to completion.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 15082

PIPING INSULATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Insulation for piping and related systems.
- B. Related sections:
 - 1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
 - 2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
 - 3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents:
 - a. Section 16850 – Electrical Heat Tracing

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded, and Seamless.
 - 2. C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 - 3. C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 4. C 533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation.
 - 5. C 547 - Standard Specification for Mineral Fiber Pipe Insulation.
 - 6. C 552 - Standard Specification for Cellular Glass Thermal Insulation.
 - 7. C 795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
 - 8. C 929 - Standard Practice for Handling, Transporting, Shipping, Storage, Receiving, and Application of Thermal Insulation Materials for Use in Contact with Austenitic Stainless Steel.
 - 9. C 1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
 - 10. D 1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
 - 11. D 2310 - Standard Classification of Machine-Made "Fiberglass" (Glass-Fiber-Reinforced-Thermosetting-Resin) Pipe.
 - 12. E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 13. E 96 - Standard Test Methods for Water Vapor Transmission of Materials.

1.03 DEFINITIONS

- A. Buried: Piping that is installed below buildings, foundations, or finish grade, either in soil or encased in concrete in soil.
- B. Concealed: Piping above suspended ceilings and within walls, partitions, shafts, or service spaces and spaces not normally exposed to view but not buried.
- C. Exterior: Piping that is installed under canopies, outside a building, or within a pipe trench or tunnel.
- D. Flame spread and smoke density: Burning characteristics determined in accordance with ASTM E 84. No units apply to value.
- E. Interior: Piping that is installed inside a building.
- F. K factor: Thermal conductivity determined in accordance with ASTM C 177 or C 518 and expressed in units of BTU-inch/hour-square feet -degrees Fahrenheit.
- G. Mineral fiber: Fibers manufactured of glass, rock, or slag processed from a molten state, with or without a binder.
- H. Water vapor permeance: Water vapor transmission determined in accordance with ASTM E 96 and expressed in units of perm-inch.

1.04 SUBMITTALS

- A. Product data:
 - 1. Insulation properties: Include K factor, thickness, density, operating temperature limits, tensile strength, compressive strength, moisture absorption, flame spread, and smoke developed in accordance with ASTM E 84.
 - 2. Cladding properties: Include covering material, cover thickness, tensile strength, tear strength, permeability in accordance with ASTM E 96, flame spread, and smoke developed in accordance with ASTM E 84, closure type or devices, and accessories.
 - 3. Insulating blankets: Include manufacturer, blanket part number or description, materials, performance characteristics, method of attaching to equipment, listing of locations where insulating blankets will be installed.
- B. Manufacturer's application instructions: Include assembly and application drawings and detailed instructions.
- C. Laboratory report: Provide certified laboratory report stating that insulation is not manufactured using chlorinated polymers and does not contain chlorides, bromides, sulfates, or fire-rated materials.
- D. Provide Manufacturer's Certificate of Source Testing.
- E. Provide Manufacturer's Certificate of Installation and Functionality Compliance.

1.05 REGULATORY REQUIREMENTS

- A. Projects located in California comply with California Energy Commission Energy Efficiency Standards for Residential and Non-Residential Buildings.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store insulation materials and accessories under cover and protected from moisture.
- B. Handle and store insulation for use on stainless steel in accordance with ASTM C 929.

1.07 SEQUENCING AND SCHEDULING

- A. Install and functionally test heat tracing before installation of insulation.
- B. Before beginning installation of piping insulation, verify that the Engineer has accepted piping tests, pipe coating applications, and heat tracing tests.

PART 2 PRODUCTS

2.01 PIPE INSULATION, GENERAL REQUIREMENTS

- A. Piping insulation shall be tubular type or the flexible blanket type.
- B. Insulation thicknesses shall be 1.5" thick for tubular type and 1" thick for flexible blanket type.

2.02 PIPE INSULATION

- A. Insulation types: Provide in accordance with the insulation types listed and scheduled.
- B. Insulation, Type 1:
 - 1. Insulation material: Fiberglass type insulations conforming to the requirements of ASTM C547, Type 1.
 - 2. Manufacturers: One of the following or equal:
 - a. Owens Corning, SSL II with ASJ Max
 - b. John Manville, Micro-Lok HP
 - 3. Minimum temperature range: 0 degrees Fahrenheit to plus 220 degrees Fahrenheit.
 - 4. K factor at 75 degrees Fahrenheit: Not more than 0.27 BTU-inch/hour-square feet-degrees Fahrenheit.
 - 5. Fire ratings:
 - a. Flame spread: 25 or less.
 - b. Smoke density: 50 or less for insulation thicknesses up to 1.5 inches.
 - 6. Joints: Seal with manufacturer's recommended contact adhesive to form continuous water barrier.

2.03 INSULATION CLADDING

- A. Cladding, Type 3:
 - 1. Material: Aluminum, Alloy 5005; 0.016-inch (26 gauge) minimum thickness, smooth.
 - 2. Overlap: Overlap circumferential joints 4 inches minimum; overlap longitudinal joints 1-inch minimum; longitudinal joints oriented to minimize water entry.
 - 3. Bands: 0.5 inch wide, 0.0508 inch (16 gauge) thick aluminum, same alloy as cladding or 0.0179 inch thick Type 304 stainless steel; install on 18-inch centers, uniformly spaced and at all fitting joints.
 - 4. Joint seal: Apply waterproof adhesive at joints and overlaps.
 - 5. Fittings: Custom fit of same materials.
 - 6. Manufacturers: One of the following or equal:
 - a. Childers Products.
 - b. Premetco International.

2.04 VAPOR BARRIERS

- A. Vapor barrier, Type 1:
 - 1. Material: White kraft paper bound to aluminum foil in accordance with ASTM C 1136, Type 1.
 - 2. Permeability: 0.02 perms or lower.
 - 3. Maximum flame spread rating: 25.
 - 4. Edge seal: Pressure-sensitive tape lap seal.
 - 5. Circumferential joints: 4-inch wide tape or 4-inch overlap with adhesive seal.
- B. Vapor barrier, Type 2:
 - 1. Material: Mastic.
 - 2. Manufacturers: One of the following or equal:
 - a. Benjamin Foster, No. 30-76.
 - b. Insul-Coustic, No. I.C.-580.
 - c. Foster Products, 36-10/46-10 Weatherite.
 - d. Childers Products CP10/11 Vi-Acryn.

2.05 RELATED MATERIALS

- A. Cover adhesive: Premium adhesive as recommended by the insulation cover supplier for heavy-duty service in corrosive, wet environments. Standard-duty adhesives are not permitted.

2.06 REMOVABLE INSULATING BLANKETS

- A. In piping systems specified to be insulated, use removable insulating blankets for valves, meters, strainers, filters, and other in-line piping appurtenances and equipment requiring periodic servicing.
- B. Size limits: Use removable insulating blankets for equipment and piping appurtenances 3-inch in nominal size and larger. Insulate equipment and piping appurtenances less than 3-inch with molded sections of insulation or by field cutting insulation to conform to the shape of the component and to fit tightly around the component.
- C. Manufacturers: One of the following, or equal:

1. Superior Energies, Inc., Temp-Set
 2. Advanced Thermal Products, Inc., ATP Standard.
 3. Fit Tight Covers Company, Inc.
 4. Removable Insulation Covers DBA ARRIC CORPORATION
 5. ThermaXX Jacketings, LLC, Thermal Blanket insulation
- D. Low temperature insulating blankets rated up to 350 degrees Fahrenheit:
1. Use: For service temperatures up to 350 degrees Fahrenheit.
 2. Insulation: Fiberglass fiber, K factor 0.29 at 75 degrees Fahrenheit or better.
 3. Cover: 17-ounce fabric with both sides covered with silicone-impregnated glass cloth suitable for temperatures up to 800 degrees Fahrenheit.
 4. Cover fasteners: Use one of the following systems:
 - a. Grommets in the blanket and stainless steel wire.
 - b. 1-inch wide straps with stainless steel rectangular ring buckles and Velcro on strap tail.
 - c. Velcro sewed to cover along length of joint.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of conditions: Before installing insulation, verify satisfactory completion of pressure tests of piping systems and functional tests of heat tracing equipment.
- B. Examine piping surfaces and verify that surfaces are dry and free of loose scale, rust, dirt, oil, or water before applying insulation.
- C. Examine insulation materials and accessories before installation. Do not install insulation and cladding that have been damaged or insulation that has become wet.

3.02 INSULATION SCHEDULE

- A. All piping shall be considered outdoor piping.

Service Designation	Location	Insulation Type	Cladding Type	Service Temp. °F	Vapor Barrier
Fire Sprinkler Pipe	Exterior	1	3	0-100	Required
Fire Sprinkler Main Appurtenances	Exterior	Blanket	Blanket	0-100	N/A
Notes: (4) See insulation thickness in Article 2.01, Paragraph B.					

3.03 INSTALLATION

- A. All insulated piping shall be clean and dry prior to the installation of insulation. Clean all pipes to be covered with soap and water.

- B. Install insulation and cladding materials in accordance with manufacturer's written instructions.
- C. Apply insulation in smooth, clean manner with tight and finished smooth joints. Fit insulation tightly against surfaces. Insulate each continuous run of pipe with full-length sections of insulation with a single piece cut to length to complete the run of pipe. Do not use cut pieces or scraps to complete the installation.
- D. Butt longitudinal and circumferential insulation joints firmly together.
- E. Maintain the integrity of vapor barrier. Do not use staples to hold vapor barrier overlaps in place.
- F. Apply sealant or cement when previous applications of adhesives and cement have thoroughly dried.
- G. Apply insulation to permit expansion or contraction of pipelines without damage to insulation or cladding.
- H. Fittings:
 - 1. Insulate fittings by covering with mitered sections of insulation or utilize factory-made prefabricated fitting shapes.
 - 2. Terminate preformed pipe cladding or covering at sufficient distance from flanges to permit removal of bolts.
 - 3. Overlap flange and flanged fitting insulation on adjacent pipe covering by at least 2 inches.
- I. Valves:
 - 1. Insulate valves 3-inch in nominal size and larger with removable insulating blankets.
 - 2. Size blanket to extend up to packing gland only so that replacement of packing does not require removal of insulating blanket.
- J. Provide continuous insulation through and over pipe supports.
- K. Extend insulation against insulation end protection shields or covers so that insulation voids do not exist and provide watertight end seals and covers where insulation terminates.
- L. Provide continuous pipe insulation and covering through sleeves or openings in walls and floors. When buried pipe enters a building through a below grade wall or slab penetration, begin insulation system on interior side of penetration.
- M. Apply premolded pipe insulation when used on pipe traced with either tubing or electric cable type.

3.04 TESTING

- A. Prior to the installation of insulation, the contractor will have completed the installation of the heat trace system and installation testing.

3.05 ACCEPTANCE

- A. Acceptance of insulation will be via visual inspection of the insulated pipes.
Contractor is required to provide ladders, man-lift or scaffolding for inspectors use.

END OF SECTION

SECTION 16010

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work Included:
 - 1. Provide all required labor, project equipment and materials, tools, construction equipment, safety equipment, transportation, and test equipment, and satisfactorily complete all work shown on the Drawings, included in these Specifications, or required for a complete and fully operating facility. In addition, provide wiring for the equipment that will be provided under other Divisions of these Specifications.
- B. Safety: Conduct operations in accordance with NFPA 70E, Standard for Electrical Safety Requirements for Employee Workspaces.

1.02 SUBMITTALS

- A. Shop Drawings:
 - 1. General: Submit Product Review or Product information shop drawings for materials and equipment as required under each Specification section.
 - 2. For Product Review submittals, submit a single, complete submittal package for all items specified in a particular Specification section. Submittal packages shall be organized by equipment type. Include separators and tabs or other means of identifying each Specification paragraph (e.g., 2.01, 2.02, etc.) of the submittal.
- B. As-Built Shop Drawings: Revise manufacturer's shop drawings to show any construction changes. Prior to final acceptance, deliver one complete set to the Engineer for his favorable review. After such review, provide copies of all CAD produced drawings on media satisfactory to the Engineer in AutoCAD DWG format.
- C. Manuals:
 - 1. Furnish manuals for equipment where Manuals are specified in the equipment Specifications. Submit manuals in accordance with the requirements of Division 1 and City Standards.
 - 2. In each manual, include equipment descriptions, record shop drawings, operation and maintenance instructions, parts ordering data and ratings for the equipment furnished for this project.
- D. Spare Parts: For each piece of equipment, submit a list of recommended spare parts. Include part numbers and the name, address, and telephone number of the supplier.

1.03 QUALITY ASSURANCE

- A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the following applicable codes:
 - 1. National Electrical Code (NEC), applicable edition;
 - 2. State of California Electrical Code
 - 2. National Electrical Safety Code (NESC), recent edition;
 - 3. Occupational Safety and Health Act (OSHA) standards;
 - 4. Rules For Overhead Electric Line Construction, General Order No. 95, Public Utilities Commission of the State of California, (G.O.95);
 - 5. Rules For Construction of Underground Electric Supply and Communication Systems, General Order No. 128, Public Utilities Commission of the State of California, (G.O.128),; and
 - 6. Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, International Electrical Testing Association (NETA), recent edition.
- B. Variances: In instances where two or more codes are at variance, the most restrictive requirements shall apply.
- C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA). The revisions of these standards in effect on the date of issuance of the Contract Documents shall apply.
- D. Underwriters Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Safety labeling and listing by other organizations, such as ETL Testing Laboratories, may be substituted for UL labeling and listing if acceptable to the authority having code enforcement jurisdiction. Provide service entrance labels for all equipment required by the NEC to have such labels.
- E. Contractor's Expense: Obtain and pay for all required bonds, insurance, licenses, permits and inspections, and pay all taxes, fees and utility charges that will be required for the electrical construction work.
- F. Series short circuit ratings for protective devices are not allowed.

1.04 DRAWINGS

- A. Drawings: The Electrical Drawings are diagrammatic; exact locations of electrical products shall be verified in the field with the Engineer. Except where special details are used to illustrate the method of installation of a particular piece or type of equipment or material, the requirements or descriptions in this Specification shall take precedence in the event of conflict.
 - 1. Locations of equipment, inserts, anchors, motors, panels, pull boxes, manholes, conduits, stub-ups, fittings, lighting fixtures, power and convenience outlets, exterior lighting units and ground wells are approximate unless dimensioned; verify locations with the Engineer prior to installation.
Field verify scaled dimensions on Drawings.

2. Review the Drawings and Specification Divisions of other trades and perform the work that will be required for the installations.
 3. Should there be a need to deviate from the Drawings and Specifications, submit written details and reasons for all changes to the Engineer for favorable review.
- B. As-Built Drawings:
1. Maintain a complete and accurate record set of Drawings for the electrical construction work.
 2. Record all work that is installed differently than shown on the Drawings.
 3. Upon completion of the work, transfer all marked changes to a clean set of full-size Drawings with red ink. Mark the Drawings "AS-BUILT DRAWINGS" and submit them to the Engineer when the electrical work is completed.
 4. Locate all underground conduits by accurate field-measured dimensions from walls and corners, etc., of surrounding structures.

1.05 FACTORY TESTS

- A. Submit reports of factory tests and adjustments performed by equipment manufacturers to the Engineer prior to field testing and adjustment of the equipment. These reports shall identify the equipment and show dates, results of tests, measured values and final adjustment settings. Provide factory tests and adjustments for equipment where factory tests are specified in the equipment Specifications.

1.07 COORDINATION

- A. Coordinate the work with the other trades, code authorities, utilities, and the Owner.
- B. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods. Schedule and carry out shutdowns so as to cause the least disruption to operation of the plant and privately owned facilities.
- C. When two trades join together in an area, make certain that no electrical work is omitted.

1.08 JOB CONDITIONS

- A. Operations:
1. Keep all power shutdown periods to a minimum.
 2. Carry out shutdowns only after the schedule has been favorably reviewed by the Engineer.
- B. Construction Power:
1. Make all arrangements for the required construction power.
 2. When required, provide all equipment, materials and wiring in accordance with the applicable codes and regulations.
 3. Upon completion of the project, remove all temporary construction power equipment, material and wiring from the site as the property of the Contractor.

- C. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.09 ELECTRICAL AND TELEPHONE SERVICES

- A. Provide all the equipment and materials not provided by the utility companies for permanent electrical and telephone services at the locations shown on the Drawings and described hereinafter. All work shall meet the requirements of the serving utility companies.
- B. Coordinate all work with the serving utilities, obtain the required inspections, and notify the respective utility when service is required.

1.10 DAMAGED PRODUCTS

- A. Notify the Engineer in writing in the event that any equipment or material is damaged.
- B. Obtain prior favorable review by the Engineer before making repairs to damaged products.

1.12 LOCATIONS

- A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located, as defined in Paragraph B. herein.
- B. Definitions of Types of Locations:
 - 1. Dry Locations: All those indoor areas which do not fall within the definitions below for Wet, Damp, Hazardous, or Corrosive Locations and which are not otherwise designated on the Drawings.
 - 2. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

PART 2 - PRODUCTS

2.01 STANDARD OF QUALITY

- A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are favorably reviewed by the Engineer prior to installation.
- B. It is the intent of these Specifications and Drawings to secure high quality in all materials and equipment in order to facilitate operation and maintenance of the facility. All equipment and materials shall be new and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses, which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately stayed, braced and anchored and shall be installed in a neat

and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details.

- C. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble-free service. Light-duty, fragile and competitive grade devices of doubtful durability shall not be used.

2.02 NAMEPLATES

- A. For each piece of electrical equipment, provide a manufacturer's nameplate showing its name, location, the pertinent ratings and the model designation.
- B. Identify each piece of equipment and related controls with a rigid laminated engraved phenolic nameplate. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel screws or, where favorably reviewed by the Engineer, with epoxy cement. Where no inscription is indicated on the Drawings, furnish nameplates with an appropriate inscription furnished by the Engineer upon prior request by the Contractor.
- C. Each control device, including pushbuttons, control switches, and indicating lights, shall have an integral legend plate or nameplate indicating the device function. These shall be inscribed as indicated on the Drawings or as favorably reviewed by the Engineer.

2.03 FASTENERS

- A. Fasteners for securing equipment to concrete walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel. Provide stainless steel fasteners in Corrosive Locations. When fastening to existing walls, floors, and the like, provide capsule anchors, not expansion shields. Size capsule anchors to meet load requirements. Minimum size capsule anchor bolt is 3/8-inch. Provide submittal for all fasteners.

2.04 PAINTING

- A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish, which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Engineer.

2.05 ENCLOSURES

- A. Unless otherwise noted, provide enclosures as follows:
 - 1. Dry Locations: NEMA Type 1
 - 2. Wet Locations: NEMA Type 4X
 - 3. See additional requirements below in Paragraph 3.08, Metal Panels.

PART 3 - EXECUTION

3.01 REQUIREMENTS

- A. All electrical installations shall conform to the codes and standards outlined in this Section.

3.02 WORKMANSHIP

- A. Assign a qualified representative who shall supervise the electrical construction work from beginning to completion and final acceptance.
- B. Perform all labor using qualified craftsmen, who have had experience on similar projects.
- C. Install all equipment in a neat and workmanlike manner as required by the NEC, following NECA 1 - Standard Practices for Good Workmanship in Electrical Construction.
- D. Ensure that all equipment and materials fit properly in their installations.
- E. Perform any required work to correct improperly fit installations at no additional expense to the Owner.

3.03 EXCAVATION AND BACKFILL

- A. Provide the excavations for electrical equipment foundations and trenches for conduits as shown on the Drawings.
- B. Exercise caution during all excavation work and avoid damage to existing underground pipes. Exercise extreme caution when working near existing electrical conduits and facilities. Field verify the location of all electrical facilities before proceeding with any nearby work.
- C. Refer to Section 19, Earthwork, Section 39A Asphalt Concrete Trench Paving, Section B Electrical Work of these Specifications for additional excavation and backfilling requirements.

3.04 CONDUCTOR IDENTIFICATION

- A. Identify all wires and cables in conformance with the requirements of Sections 16120. This requirement applies to all equipment provided under this contract, regardless of Division, as well as to all conductors provided or worked on during this contract.

3.05 INSTALLING EQUIPMENT

- A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

- B. Before installing heat trace wires and conductors, clean mounting surfaces with soap and water to remove all foreign matter. Dry thoroughly. Clean pipe and heat trace wire before installing insulation if heat trace wire or adjacent pipe is dirty.

3.06 CUTTING, DRILLING, AND WELDING

- A. Provide any cutting, drilling, and welding that is required for the electrical construction work.
- B. Structural members shall not be cut or drilled, except when favorably reviewed by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry.
- C. Provide the required welding for equipment supports. Conduits and fittings shall not be welded to structural steel.
- D. Perform patch work with the same materials as the surrounding area and finish to match.

3.07 METAL PANELS

- A. Mount all metal panels which are mounted on or abutting concrete walls in damp locations or any outside walls 1/4-inch from the wall, and paint the back sides of the panels with a high build epoxy primer. Film thickness shall be 10 mils minimum.

3.08 FIELD TESTS

- A. Perform tests in accordance with applicable procedures as described in NETA Acceptance Testing Specifications.
- B. Give sufficient notice to the Engineer prior to any test to permit witnessing the test.
- C. Provide the services of a recognized independent testing laboratory and pay all costs of performing the inspections and tests as specified herein.
- D. The testing laboratory shall provide all materials, equipment, labor and technical supervision to perform such tests and inspections. It is the intent of these tests to ensure that all electrical equipment is operational within industry and manufacturer's tolerances and is installed in accordance with the Contract Documents and manufacturer's instructions. The tests and inspections shall determine the suitability for energization.
- E. The testing laboratory shall meet federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907. Membership in the International Electrical Testing Association (NETA) constitutes proof of meeting such criteria. The testing laboratory shall submit proof of these qualifications to the Engineer for review. Testing laboratory shall be Electrical Testing and Controls, Electro-Test, Power Systems, or equal.
- F. The testing laboratory shall have a calibration program, which maintains all applicable test instrumentation within, rated accuracy. The accuracy shall be

traceable to the National Bureau of Standards in an unbroken chain. Instruments shall be calibrated in accordance with the following frequency schedule:

1. Field instruments: 6 months maximum
 2. Laboratory instruments: 12 months
 3. Leased specialty equipment: 12 months
- Date calibration labels shall be visible on all test equipment.

- G. Where testing pursuant to NETA requirements is required in these specifications, submit a test report which includes the following:
1. Name of project, name of person performing test, and date of test
 2. Description of equipment tested
 3. Description of test
 4. List of test equipment used and calibration date
 5. Test results
 6. Conclusions and recommendations
 7. Appendix, including appropriate test forms
- The test report shall be bound and its contents certified. Submit the completed report directly to the Engineer no later than thirty (30) days after completion of the test unless directed otherwise. Number of reports to be submitted for review shall be the same as the number required for shop drawing submittals.
- H. Safety practices shall include, but are not limited to, the following requirements:
1. Occupational Safety and Health Act of, OSHA.
 2. Accident Prevention Manual for Industrial Operations, Seventh Edition, National Safety Council, Chapter 4.
 3. Applicable state and local safety operating procedures.
- I. All field tests shall be performed with apparatus de-energized except where otherwise specifically required by Section 7 of the latest Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems published by NETA. The testing laboratory shall have a designated safety representative who shall be present on the project and supervise operations with respect to safety. Circuits operating in excess of 600 volts between conductors shall have conductors shorted to ground by a hot-line grounded device approved for the purpose. In all cases, work shall not proceed until the safety representative has determined that it is safe to do so. The testing laboratory shall have available sufficient protective barriers and warning signs to conduct specified test safely. Tests shall include but not limited to 7.13 Grounding Systems, 7.14 Ground Fault Protection System (as applicable), 7.3.2 Low Voltage Cables (600-Volt Maximum, and 7.6.1.1 Circuit Breakers.
- J. Electrical equipment and materials furnished and installed by the Contractor, and the testing equipment listed below shall be tested in accordance with the "Inspection and Test Procedures" and "System Function Tests" (Section 7) of the latest Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems published by NETA. Tests shall not include any tests listed as optional in the aforementioned NETA Specifications unless specifically noted in respective equipment specifications for this project.
- K. Retesting will be required for all unsatisfactory tests after the equipment or system has been repaired. Retest all related equipment and systems if required by the

Engineer. Repair and retest equipment and systems, which have been satisfactorily tested but later, fail, until satisfactory performance is obtained.

- L. Putting Equipment and Cables into Service: Submittal and favorable review of the specified factory and field tests shall occur before the Contractor is permitted to place the respective equipment or cable into service.
- M. Miscellaneous Tests
 - 1. Insulation Resistance, Continuity, Rotation: Perform routine insulation resistance, continuity and rotation tests for all distribution and utilization equipment including all motors 1/2 horsepower and larger prior and in addition to tests performed by the testing laboratory specified herein. Supply a suitable and stable source of test power to the test laboratory at each test site. The testing laboratory shall specify requirements. Notify the testing laboratory when equipment becomes available for acceptance tests. Work shall be coordinated to expedite project scheduling. All testing shall be performed in the presence of the Engineer. The testing laboratory shall be responsible for implementing all final settings and adjustments on protective devices and tap changes. Any system material or workmanship that is found defective on the basis of acceptance tests shall be reported directly to the Engineer. The testing laboratory shall maintain a written record of all tests and upon completion of project, assemble and certify a final test report.
 - 2. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed, adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, and including alarm conditions, and demonstrate satisfactory interfacing with the data acquisition and alarm systems SCADA.

3.09 EQUIPMENT PROTECTION

- A. Exercise care at all times after installation of equipment, motor control centers, etc., to keep out foreign matter, dust, dirt, debris, or moisture. Use protective sheet metal covers, canvas, heat lamps, etc., as needed to ensure equipment protection.

3.10 CLEANING EQUIPMENT

- A. Thoroughly clean all soiled surfaces of installed equipment and materials.
- B. Clean out and vacuum all construction debris from the bottom of all equipment.
- C. Provide and touch-up to original condition any factory painting that has been marred or scratched during shipment or installation, using paint furnished by the equipment manufacturer.

3.11 CLEANUP

- A. Upon completion of the electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Engineer.

END OF SECTION

SECTION 16110

CONDUIT, RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Section 16010 become a part of this Section as if repeated herein.

1.02 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI) Publications:
 - 1. C80.1 Specification for Zinc Coated Rigid Steel Conduit
 - 2. C80.3 Specifications for Zinc Coated Electrical Metallic Tubing
 - 3. C80.5 Specifications for Rigid Aluminum Conduit
- B. Federal Specifications (FS):
 - 1. FS W-C-1094 W-C-1094A Conduit and Conduit Fittings, Plastic, Rigid
 - 2. FS WW-C-540 WW-C-540A Conduit, Metal, Rigid, (Electrical, Aluminum)
WW-C-540C Conduit, Metal, Rigid & Coupling, Elbow & Nipple, Electrical Conduit, Aluminum
 - 3. FS WW-C-563 WW-C-563A Electrical Metallic Tubing
 - 4. FS WW-C-566 WW-C-566C Flexible Metal Conduit
 - 5. FS WW-C-581 WW-C-581E Intermediate Rigid Metal Conduit, Zinc Coated
- C. National Electrical Manufacturers Association (NEMA) Publications:
 - 1. RN 1 Polyvinyl Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
 - 2. TC 6 PVC and ABS Plastic Utilities Duct for Underground Installation
 - 3. TC 14 Filament-Wound Reinforced Thermosetting Resin Conduit
- D. Underwriters Laboratories (UL) Standards:
 - 1. 6 Rigid Metal Electrical Conduit
 - 2. 6A Electrical Rigid Metal Conduit – Aluminum, Red Brass and Stainless Steel
 - 3. 360 Liquid-Tight Flexible Steel Electrical Conduit
 - 4. 651 Electrical Rigid Nonmetallic Conduit
 - 5. 651A Type EB and A Rigid PVC Conduit and HDPE Conduit
 - 6. 797 Electrical Metallic Tubing
 - 7. 1242 Intermediate Metal Conduit

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Section 16010.

1.04 LOCATIONS

- A. Refer to Section 16010 1.12 for definitions of types of locations.

PART 2 - PRODUCTS

2.01 CONDUIT, RACEWAYS

- A. General:
 - 1. Rigid metal conduit shall be used in all conduit systems, except where otherwise shown on the Drawings, where flexible conduit is required, or where these Specifications require, or allow the use of or polyvinyl chloride (PVC) conduit.
 - 2. The minimum size raceway shall be 3/4-inch unless indicated otherwise on the Drawings.
- B. Rigid Aluminum Conduit (RAC):
 - 1. Material:
 - a. Extruded from 6063 alloy in temper designation T-1.
 - b. Maximum 1/10 percent copper content.
 - c. Containing lubricating inside liners.
 - 2. NPT standard threads with a 3/4 -inch taper per foot:
 - a. Running conduit threads are not acceptable.
 - 3. Provide aluminum fittings and conduit bodies.
- C. Where PVC coated rigid aluminum conduit is called for, it shall conforming to NEMA RN 1, with factory-applied PVC coating 40 mils thick.
- D. Flexible Conduit:
 - 1. Flexible metal conduit shall be liquid-tight, shall have a moisture- and oil-proof PVC jacket extruded over a galvanized, flexible steel conduit, and shall conform to UL 360.
 - 2. Flexible conduit for hazardous locations shall be UL listed for the applicable Class, Division, and Group.
- E. Rigid Nonmetallic Conduit: Rigid nonmetallic conduit shall be PVC Schedule 40 (PVC-40) conduit approved for underground use and for use with 90°C wires, and shall conform to UL 651.
- F. Ducts: Ducts shall be PVC, Type EB, UL listed for concrete encased burial, conforming to NEMA Standard TC6 and UL 651A, and rated at 90°C. Base and intermediate spacers shall be interlocking plastic type made for the specific sizes of ducts used. Duct spacing shall be 7-1/2-inch center-to-center.

2.02 CONDUIT SUPPORTS

- A. Supports for individual conduits shall be the same material as conduits or stainless steel one-hole type with conduit back spacer.
- B. Supports for multiple conduits shall be hot-dip galvanized Unistrut or Superstrut channels, or equal. All associated hardware shall be hot-dip galvanized.
- C. All channels, strut, threaded rods, nuts and clamps in corrosive areas shall be of epoxy resin reinforced fiberglass material. Provide Robroy, Superstrut, or equal.

2.03 FITTINGS

- A. Fittings for use with rigid steel GRS shall be hot dipped galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse-Hinds Condulets, Appleton Unilets, or equal. Provide threaded-type couplings and connectors; set-screw type and compression-type are not acceptable.
- B. Fittings for use with RAC shall be cast aluminum bodies and covers. Conduit bodies to conform to Form 8, Mark 9, or Mogul design. Mogul design conforming to NEC requirements for bending space for large conductors for conduit trade sizes of 1 inch or larger with conductors #4 AWG and larger, or where required for wire bending space. Gasketed covers attached to bodies with stainless steel screws screwed to threaded holes in conduit bodies.
- C. Fittings for use with either rigid nonmetallic conduit or duct shall be PVC and have solvent-weld-type conduit connections. If such are not available, then the Specification for PVC coated galvanized rigid steel fittings shall apply.
- D. Fittings for flexible conduit shall be Appleton Type ST, O-Z Gedney Series 4Q, or equal.
- E. Union couplings for conduits shall be the Erickson type and shall be Appleton Type EC, O-Z Gedney 3-piece Series 4, or equal. Union couplings for aluminum shall be aluminum concrete tight, 3-piece construction. Threadless couplings shall not be used.
- F. Bushings:
 - 1. Bushings shall be the insulated type.
 - 2. Bushings for rigid steel shall be hot dip galvanized insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or equal.
 - 3. Bushings for RAC shall be aluminum insulated grounding type Appleton Type GJB or equal.
- G. Conduit seals shall have zinc electroplate and shall be Crouse-Hinds Type EYS or EZS; Appleton Type EYS, ESU, or EY series; or equal.

2.04 CONDUIT SEALANTS

- A. Moisture Barrier Types: Sealant shall be a non-toxic, non-shrink, non-hardening, putty type hand applied material providing an effective barrier under submerged conditions.
- B. Fire Retardant Types: Fire stop material shall be a reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL 1479. Provide products indicated by the manufacturer to be suitable for the type and size of penetration.

2.05 WARNING TAPE

- A. Provide electrical warning tape in duct bank as shown on the Drawings. The tape shall be 6 inches wide, red with black lettering stating "CAUTION BURIED

ELECTRIC LINE." The tape shall be made of 6-mil polymer with 36,000 psi tensile strength.

PART 3 - EXECUTION

3.01 CONDUIT, RACEWAY AND FITTING INSTALLATION

- A. From pull point to pull point, the sum of the angles of all of the bends and offsets shall not exceed 270 degrees unless approved by the Engineer.
- B. For power, control and signal circuits, provide conduit per Conduit Use Tables below, unless specifically indicated otherwise on the Drawings:
 - 1. Exception: For raceways leaving a building above grade and then going below grade, provide PVC-coated RAC from a point 3 feet above grade to a point 5 feet from the building wall.
- C. At all boxes and equipment, provide insulated type metallic grounding bushings for metallic conduits. Bond together all conduits to provide continuity of the equipment grounding system. Size bonding conductor per code.
- D. Provide flexible conduit in lengths of not more than 18 inches at connections to motors, valves and any equipment subject to vibration or relative movement.
- E. Conduits embedded in concrete floors on grade shall be installed between grids of reinforcing steel, or shall be encased below the floors, provided the concrete is thickened in a manner satisfactory to the Engineer. The maximum conduit size in slabs shall not exceed 1-½ inches unless approved by the Engineer. Installation of conduit below the bottom of this slab shall be encased in concrete.
- F. Provide aluminum factory ells for both RAC raceways. Provide RAC for offsets in RAC raceways.
- G. Underground Raceways: Where practical, slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the handhole located outside the building. For additional requirements see Section 16402.
- H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits exposed except where the Drawings indicate that they are to be embedded in the floor slab, walls, or ceiling, or to be installed underground.
 - 1. Exposed Conduits:
 - a. Support exposed conduits within 1 foot of any outlet and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps. Coordinate conduit locations with piping, equipment, fixtures, and with structural and architectural elements. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel to building lines.
 - b. Group together exposed conduits in horizontal runs located away from walls and support on trapeze hangers. Arrange such conduits uniformly

and neatly. Trapeze hangers shall consist of channels of adequate size, suspended by means of rods or other suitable means from the ceiling or from pipe hangers. Install such runs so as not to interfere with the operation of valves or any other equipment, and keep at least 6 inches clear of any pipe which may operate at more than 100°F. Treat cut surfaces or damaged ends with corrosion-resistant coatings such as "Devcon Z", prepared by Subox Coatings; "Galvanox Type I", prepared by Pedley-Knowles; or equal. Application shall follow manufacturer's recommendation.

- I. When expansion joints are crossed, whether conduit is embedded or exposed, provide watertight expansion fittings and bonding jumpers. In hazardous locations, provide Crouse-Hinds UNF/UNV, Appleton, or equal. In unclassified locations, provide Crouse-Hinds XD, Appleton, or equal.
- J. Spare Raceways: After completing a conduit run between manholes, handholes, or pullboxes, prove the integrity of the conduit run. Use an air compressor to blow in a pull-line, and then use the pull-line to pull a mandrel through the entire conduit run. Install new 3/16-inch nylon, 800 pound test pull-line which has tape measure marking every foot to indicate length. Plug the ends of the conduit, with conduit cap plugs.
- K. All penetrations through walls into or out of corrosive locations where the corrosive agent is gaseous, as defined in Section 16010 shall be made gas-tight. In concrete walls, pour concrete after the conduit is in place, if possible. If not, core drill concrete or CMU walls, install conduit and caulk around it with non-shrink grout. Install conduit seal in each conduit near the penetration.
- L. All conduit penetrations through interior walls and floors shall be sealed with fire retardant type conduit sealant.
- M. Conduit Identification: At both terminations of each conduit, i.e. where conduit comes out of ground and in each manhole, handhold, pull box, cabinet, motor control center or other equipment enclosure, identify each conduit with a conduit number starting with C-1, by means of a stamped brass tag affixed with stainless steel wire or stainless steel chain. Stainless steel wire must be crimp connected. Twisting ends together is not acceptable. Stencil all exposed conduits for identification at least once in each room/area.
- N. Conduit Seals:
 - 1. Moisture Seals: Provide in accordance with NEC Paragraph 300-5(g).
 - 2. Gas Seals: Provide in accordance with NEC Paragraph 501-5.
- O. Conduit in finished areas shall be installed concealed.
- P. Conduit shall not be supported from T-bar ceiling suspension wires.
- Q. Conduits shall not penetrate beams, columns or building footings unless approved by the Engineer. Generally, concealed conduits shall be installed below building footings.

- R. Flexible metallic conduit shall have a maximum length of 6 feet. Flexible metallic conduit shall not be considered as a ground conductor. Flexible metallic conduit shall only be installed in exposed or accessible locations.
- S. Rigid PVC conduit shall be stored on a flat surface and shielded from the sun.

CONDUIT USE TABLE 1

	Inside Buildings						
	Exposed			Concealed			
Circuit Type	Standard	Corrosive	Hazardous	Above Suspended Ceilings	In Stud Walls	Embedded In Concrete	Slab On Grade
Power & 102 Vac Control	Aluminum	PVC Coated Aluminum	N/A	N/A	N/A	N/A	Aluminum

CONDUIT USE TABLE 2

	Outside Buildings			Transition
Circuit Type	Exposed	Buried In Soil	Duct Bank Encased In Concrete	Exposed to Underground runs
Power & 120 Vac Control	Aluminum	PVC-40*	N/A	PVC Coated Aluminum

* Provide ground wire sized per NEC requirements for all circuits.

** PVC coated GRS in wet wells, etc., that are both hazardous and corrosive, otherwise, GRS.

Notes:

- Generally, the Conduit Use Tables apply. GRS and RMC conduits are the same designation per 2.01B

END OF SECTION

SECTION 16120

LOW VOLTAGE WIRE AND CABLE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Provisions: Applicable provisions of Section 16010 become a part of this Section as if repeated herein.
- B. Related Work Described Elsewhere: Division 17.

1.02 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. B3-74 Specification for Soft or Annealed Copper Wire
 - 2. B8-77 Specification for Concentric Lay Stranded Copper Conductors, Hard, Medium-Hard, or Soft
 - 3. B173-71 Specification for Rope Lay Stranded Copper Conductors Having Concentric Stranded Members
- B. Insulated Cable Engineers Association (ICEA):
 - 1. S-66-524 Cross-Linked Thermosetting Polyethylene Insulated Wire and Cable
- C. International Electrical Testing Association (NETA);
 - 1. ATS Acceptance Testing Specifications
- D. Underwriters Laboratories (UL) Standards:
 - 1. 44 Thermoset- Insulated Wire and Cable
 - 2. 62 Flexible Cords and Fixture Wire
 - 3. 83 Thermoplastic-Insulated Wires and Cables
 - 4. 510 Insulating Tape
 - 5. 719 Non-Metallic Sheath Cable
 - 6. 1063 Stranded Conductors for Machine Tool Wires and Cables

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Section 16010.

1.04 LOCATIONS

- A. Refer to Section 16010 1.12 for definitions of types of locations.

PART 2 - PRODUCTS

2.01 CONDUCTORS

- A. General: All conductors shall be copper unless specifically shown otherwise on the Drawings or in the circuit schedule. Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and in conformance with the applicable code. All insulated conductors shall be identified with printing colored to contrast with the insulation color.
- B. Power and Control Conductors, 600 Volts and Below:
 - 1. Solid copper wires shall be 600 Volt Type THWN, sizes #12 and #10 AWG only.
 - 2. Stranded copper wire shall be 600 volt Type XHHW or RHW, Class B stranding, Sizes #8 AWG and larger.
 - 3. Fixture wire shall be 600 volt, silicone rubber insulated, 200°C, UL Type SF-2, with stranded copper conductors.
 - 4. Cords shall be 600 volt, 2-conductor plus ground, Type SO, hard service, of adequate length and with grounding type plug attached, rated in amperes as shown on the Drawings.
 - 5. Control cable (CC) shall be 90°C, 600 volt, UL listed multiconductor tray cable, Type TC. Individual conductors shall be #14 AWG, unless otherwise noted. CC shall have 15 mils PVC insulation and 4 mils nylon over individual conductors; outer jacket shall be 45 mils thickness for up to 7 conductor cables and 60 mils for 9 through 19 conductor cables. Control cables shall be Dekoron; Okonite; or equal.

2.02 SPLICES AND TERMINATIONS OF CONDUCTORS

- A. Splices:
 - 1. Wire and Cable Splicing Materials and Applications:
 - a. For Lighting Systems and Power Outlets: Wire nuts shall be twist-on type insulated connectors utilizing an outer insulating cover and a means for connecting and holding the conductors firmly. They shall be UL listed and suitable for connecting two to four solid copper conductors of #14 or #12 AWG size or two or three #10 AWG solid copper conductors.
 - b. All Equipment: Crimp type connectors shall be insulated type, suitable for the size and material of the wires and the number of wires to be spliced and for use with either solid or stranded conductors. They shall be UL listed.
 - c. Division 16 Equipment and Power Conductors: Bolted pressure connectors shall be suitable for the size and material of the conductors to be spliced. They shall be UL listed and of the split bolt or bolted split sleeve type in which the bolt or set screw does not bear directly on the conductor.
 - d. All Equipment: Epoxy splice kits shall include epoxy resin, hardener, and mold, and shall be suitable for use in wet locations and hazardous locations.
 - 2. Controllers: Termination system shall include insulated, crimp-type connectors. Coordinate the lug and boards for correct fit. All terminations shall include marker sleeves.

- B. Terminations:
 - 1. Low Voltage Terminations:
 - a. Crimp type terminals shall be UL listed, self-insulating sleeve type, with ring or rectangular type tongue, suitable for the size and material of the wire to be terminated, and for use with either solid or stranded conductors.
 - b. Terminal lugs shall be UL listed and of the split bolt or bolted split sleeve type in which the bolt or set screw does not bear directly on the conductor. Tongues shall have NEMA standard drilling. Lugs for aluminum conductors shall include a compression type heavy wall aluminum alloy adapter, factory filled with joint compound.
 - c. Crimp with manufacturer recommended ratchet-type tool with calibrated dies. Hand crimping tools are not acceptable.
- C. Tape used for splices and terminations shall be compatible with the insulation and jacket of the cable and shall be of plastic material. Tape shall conform with UL 510.
- D. Wire markers shall be heat shrink type (Raychem; T&B; or equal) or plastic sleeve type. Wire numbers shall be permanently imprinted on the markers.

PART 3 - EXECUTION

3.01 CONDUCTOR INSTALLATION

- A. Provide the following types and sizes of conductors for the uses indicated for 600 volts or less:
 - 1. Solid Stranded Copper, Sizes #12 and #10 AWG: As shown on the Drawings for circuits for receptacles, switches and light fixtures with screw-type terminals.
 - 2. Stranded Copper, Size #14 AWG and Larger, Individual Conductors or CC: As shown on the Drawings for the control of motors or other equipment. Size #14 shall not be used for power supplies to any equipment.
 - 3. Stranded Copper, Sizes #12 AWG and Larger: As shown on the drawings for motors and other power circuits.
 - 4. Stranded Copper, #8 AWG and larger: For power feeders, provide copper, not aluminum, unless specifically indicated otherwise on the Drawings or in the circuit schedule.
 - 5. Fixture Wire: For connections to all fixtures in which the temperature may exceed the rating of branch circuit conductors.
 - 6. Machine tool wiring shall be Type MTW, 600 V
- B. Color Coding: Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. An isolated ground conductor shall be identified with an orange tracer in the green body. Ungrounded conductor colors shall be as follows:
 - 1. 120/208 Volt, 3 Phase: Red, black and blue.
 - 2. 277/480 Volt, 3 Phase: Yellow, brown and orange.
 - 3. 120/240 Volt, 1 Phase: Red and black.
 - 4. 24 Vdc: Black and Red
- C. Color coding shall be in the conductor insulation for all conductors #10 AWG and smaller; for larger conductors, color shall be either in the insulation or in colored plastic tape applied at every location where the conductor is readily accessible (e.g., enclosures, pullboxes, and junction boxes).

- D. Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.
- E. Cable bending radius shall be per applicable code. Install feeder cables in one continuous length unless splices are favorably reviewed.
- F. Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in any flexible conduit or any raceway in which all or any portion of a run consists of non-metallic duct or conduit. For flexible conduit, an external bonding jumper is an acceptable alternative.
- G. In panels, bundle incoming wire and cables, No. 6 AWG and smaller, lace at intervals not greater than 6 inches, neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Perform lacing with plastic cable ties or linen lacing twine. Where plastic panel wiring duct is provided for cable runs, lacing is not necessary when the cable is properly installed in the duct.
- H. For cables crossing hinges, utilize extra flexible stranded wire, make up into groups not exceeding 12, and arrange so that they will be protected from chafing and excess flexing when the hinged member is moved.

3.02 CONDUCTOR SPLICES AND TERMINATIONS

- A. Splices: Install all conductors without splices unless necessary for installation, as determined by the Engineer. Splices, when permitted and terminations shall be in accordance with the splice or termination kit manufacturer's instructions. Splice or terminate wire and cable as follows:
 - 1. Watertight Splices: Splices in concrete pullboxes, for any type of cable or wire, shall be watertight. Make splices in low voltage cables using epoxy resin splicing kits rated for application up to 600 volts.
- B. Terminations:
 - 1. Terminate stranded #14 wire using crimp type terminals where not terminated in a box lug type terminal. Terminals must be coordinated with type of terminal board where provided.

3.03 CONDUCTOR IDENTIFICATION

- A. Except for interior lighting and receptacle circuits, identify each wire or cable at each termination and in each pullbox, junction box, handhole, and manhole using numbered and lettered wire markers. All electrically common conductors shall have the same number. Each electrically different conductor shall be uniquely numbered. Identify panelboard circuits using the panelboard identification and circuit number. Identify motor control circuits using the equipment identification number assigned to the control unit by the motor control center manufacturer and the motor control unit

terminal number. Identify other circuits as shown in the circuit schedule or as favorably reviewed by the Engineer.

- B. Conductors between terminals of different numbers shall have both terminal numbers shown at each conductor end. The terminal number closest to the end of the wire shall be the same as the terminal number.

3.04 FIELD TESTS

- A. Insulation Resistance Tests: For all circuits 150 volts to ground or more and for all motor circuits over 1/2 horsepower, test cables per NETA Standards. The insulation resistance shall be 100 megohms or more. Submit results for review. See also Section 16010.
- B. Phase Rotation: The phase rotation of all circuits shall be clockwise in sequence. The Contractor shall verify that each three-phase service, feeder and branch circuits meet this requirement. A record shall be kept at each circuit tested and, on completion, given to the Engineer for review.

END OF SECTION

SECTION 16130

BOXES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Section 16010 become part of this Section as if repeated herein.
- B. Work Included:
 - 1. Installation of all necessary outlet boxes for wiring devices, lighting fixtures, and signal equipment as noted on the Drawings.
 - 2. Installation of junction boxes as required for the consolidation of conduit runs.
 - 3. Installation of pull boxes as necessary to aid in pulling in conductor.

1.02 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM) Publication:
 - 1. A123 Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
- B. Federal Specifications (FS):
 - 1. W-C-586 Conduit Outlet Boxes, Bodies, and Entrance Caps, Electrical, Cast Metal
 - 2. W-J-800 Junction Box, Extension, Junction Box Cover, Junction Box (Steel, Cadmium or Zinc Coated)
- C. Underwriters Laboratories, Inc. (UL) Publications:
 - 1. 50 Electrical Cabinets and Boxes
 - 2. 514 Outlet Boxes and Fittings

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Section 16010.

PART 2 - PRODUCTS

2.01 OUTLET, JUNCTION AND PULL BOXES

- A. Pull Boxes and Junction Boxes: Except where NEMA 4X boxes are called for, all boxes shall be fabricated from carbon steel per UL 50. Boxes shall be welded construction with all seams or joints closed and reinforced. Boxes shall be galvanized after construction. Boxes intended for outdoor use shall be cast metal with threaded hubs and neoprene gasketed covers, or shall be of the fiberglass reinforced polyester type of 1/8-inch minimum thickness. Cover retention shall be by corrosion resistant stainless steel screws.

1. All boxes for wiring operating at 601 volts or higher shall be constructed without hinges and shall be padlockable.
2. All boxes and cabinets shall be securely fastened to building structural members so as to prevent movement in any direction. Boxes shall not be supported by lighting fixtures, suspended ceiling support wires or freely hanging rods.
 - a. Covers of boxes and cabinets mounted in horizontal plane (top or bottom) shall either weigh not more than 40 pounds or shall require not more than 40 pounds of force to open or close.
 - b. Covers of boxes and cabinets mounted in vertical plane (front, back, sides) shall either weigh not more than 60 pounds or shall require not more than 60 pounds of force to open or close. All covers over 30 pounds shall be furnished with angle support at bottom to carry weight of cover for assembly.
 - c. Covers of boxes and cabinets weighing more than 30 pounds shall be provided with lifting handles or some means of grasping other than edges.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Junction Boxes and Pull Boxes:
 1. Boxes shall be installed where required and where indicated on the Drawings.
 2. Boxes shall be readily accessible.
 3. Boxes shall not be installed in finished areas.
 4. Pull boxes shall be provided at least every 150 feet on long straight conduit runs. Spacing shall be reduced by 50 feet for each 90 degree bend. See Section 16110 for maximum bends in conduit systems.
 5. Box dimensions shall be in accordance with size and quantity of conductors and conduits entering and leaving box per NEC Article 370 requirements.
 6. All boxes, both new and existing, for medium voltage systems shall be permanently marked "High Voltage" on all surfaces with red letters which are at least 4 inches high.

END OF SECTION

SECTION 16402

UNDERGROUND ELECTRICAL WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Section 16010 become a part of this Section as if repeated herein.

1.02 APPLICABLE STANDARDS

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Federal Specifications:
 - a. RR-F-621C Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole
 - b. RR-G-661D Grating, Metal, Bar Type (Floor, except for Naval Vessels)
 - 2. American Concrete Institute (ACI):
 - a. 318 Building Code Requirements for Reinforced Concrete
 - 3. ASTM International (ASTM):
 - a. A36 Structural Steel
 - b. A153 Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - c. A615 Deformed and Plain Billet - Steel Bars for Concrete Reinforcement
 - d. C33 Concrete Aggregates
 - e. C139 Concrete Masonry Units for Construction of Catch Basins and Manholes, Specification for
 - f. C150 Portland Cement
 - g. C478 Precast Reinforced Concrete Manhole Sections, Specification for
 - h. C857 Recommended Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
 - i. C858 Standard Specification for Underground Precast Concrete Utility Structures
 - 4. American Association of State Highway and Transportation Officials (AASHTO):
 - a. HB-13 Standard Specifications for Highway Bridges
 - 5. American National Standard Institute (ANSI):
 - a. C2 National Electrical Safety Code
 - 6. National Fire Protection Association (NFPA):
 - a. 70 National Electrical Code (NEC)
 - 7. Pacific Gas and Electric Company (PG&E) Standard:
 - a. Drawing Primary Electric Underground Equipment 062000 enclosures.
 - 8. State of California Public Utilities Commission (Cal. PUC) Publication:
 - a. G.O.128 Construction of Underground Electric Supply and Communication System, Rule for

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the requirements of Section 16010.

- B. Manufacturer's Data and Shop Drawings:
 - 1. Handhole - Include a table of dimensions which shows proposed size of each handhole.
 - 2. Handhole Frame and Cover
 - 3. Sealing Material for Precast Handhole Joints
- C. Certificates
 - 1. Test Reports: Submit for approval 30 days before the materials are used, copies of laboratory test reports for the following:
 - a. Arc-proofing test for cable fireproofing materials.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Materials and equipment shall conform to the respective specifications and standards and to the Specifications herein. Electrical ratings shall be as indicated.
- B. Conduit: Provide per Section 16110.
- C. Wire and Cable: Provide per Section 16120

PART 3 - EXECUTION

3.01 NOT USED

3.02 WIRE AND CABLE INSTALLATION

- A. See Section 16120

3.03 NOT USED

3.04 UNDERGROUND RACEWAYS WITHOUT CONCRETE ENCASEMENT

- A. Provide raceways without concrete encasement only if specifically shown on the Drawings, otherwise, provide concrete encasement as above.
- B. Provide PG&E spec sand backfill three inches all around the raceway.
- C. Construct raceways per the applicable provisions above for underground raceways with concrete encasement.
- D. See Section 16110 for additional requirements.

-END OF SECTION-

SECTION 16850

ELECTRIC HEAT TRACING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Section 16010 become a part of this Section as if repeated herein.
- B. Work Included: Provide all necessary labor, tools and material to install circuit protective devices as shown on the Drawings and as described in these Specifications.

1.02 REFERENCE STANDARDS

ISA-S 5.1 Instrumentation Symbols and Identification.

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Review category of the General Conditions and the submittal requirements of Section 16010.
- B. Shop Drawings
 - 1. Show the location of thermostats and interfacing with electric power supply.
 - 2. Manufacturer's Data: Complete manufacturer's data of the electric heating cables and the thermostats.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Heat tracing shall consist of parallel alignment of electrical heating cables on the metallic pipes as recommended by manufacturer under insulation with fiberglass sections, sealed and weatherproofed. The heating cables shall be controlled by thermostats installed in representative locations and accessible from a ladder for adjustment. The heat tracing systems shall be installed complete, including heating elements, power connections, end seals, and controlling thermostats in accordance with the manufacturer's printed installation instructions.

2.02 BASIC MATERIALS

- A. Heating Cable: The electrical heat tracing system shall consist of a flat, flexible, low heat density, electrical heating strip of parallel construction, consisting of a continuous inner core of conductive material between 2 parallel copper bus strips. The electrical insulation of the heater strip shall be polyester rated for 140 degrees F temperature, and its width shall be a minimum of 1/2-inch. It shall be suitable for operation on 120 volts.
- B. Thermostats: A thermostat with a range of -40 degrees to 140 degrees F shall be provided for each heated pipe. It shall be double-pole, single-throw, and be mounted in a weatherproof NEMA Type 4X enclosure. The RTD, Resistance Thermal Device,

shall be mounted on the pipe under the insulation near thermostat on exterior pipe at a height easily accessible by an operator. Heating strips for pipes over 2-inches in size shall be rated at 8 watts per foot; for pipes 2-inches and smaller they shall be rated at 4 watts per foot.

- C. Manufacturers, or equal
 - 1. Briscoe Manufacturing Co.
 - 2. Chromalox (Emerson Electric Co.)
 - 3. For thermostats: Honeywell, Chromalox

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General
 - 1. Pipes, valves, equipment and appurtenances shall be provided with heat tracing where indicated. Where not indicated, heat tracing shall be provided in all cases where items could be endangered by freezing.
 - 2. Assemble and install equipment in strict accordance with the manufacturer's published instructions under the supervision of the manufacturer's representative. Installation shall be accomplished by competent craftsmen in a workmanlike manner. Heating strips shall be cut in the field and attached onto the pipe as required.
- B. Coordinate installation with the electrical work, to ascertain the correct location of electrical supply.
- C. Provide heat tracing electric circuits in accordance with the National Electrical Code, NFPA 70, Article 427. Ground fault protection shall be provided for the heat tracing by a Class B GFCI circuit breaker with 30 mA trip.

3.02 TESTING

- A. Prepare the equipment for operational use in accordance with the manufacturer's printed instructions. Test each heat trace operation by adjusting thermostat so RTD turns on heat trace. Verify that heat trace is on by measuring the temperature of trace at beginning, in the middle and near the end. (This will require ladders or man lift to be provided by the contractor.) Adjust thermostat so that RTD turns off power to trace and verify it does. After functional test, set thermostats so that they turn on as temperature drops to 36 °F and lower and turns off when temp reaches 40 °F.

3.03 ACCEPTANCE

- A. Final acceptance of the equipment is contingent on satisfactory appearance and operation.

-END OF SECTION

BID FORMS

CITY OF SANTA ROSA

STATE OF CALIFORNIA

**ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM
FREEZE PROTECTION**

The work to be performed and referred to herein is in the City of Santa Rosa, California and consists of improvements to be constructed in accordance with the provisions of the Invitation for Bids, containing the Notice to Bidders, the Special Provisions, the Project Plan(s), the Bid Forms and the Contract, all of which are by reference incorporated herein, and each Addendum, if any is issued, to any of the above which is also incorporated by reference herein.

TO THE AWARD AUTHORITY OF THE CITY OF SANTA ROSA

The undersigned, as bidder, declares that the only person or parties interested in this bid as principals are those named herein; that this bid is made without collusion with any other person, firm, or corporation; that Contractor has carefully examined the Project Plans, Invitation for Bids and conditions therefor, and is familiar with all bid requirements, that Contractor has examined this Contract and the provisions incorporated by reference herein, and Contractor hereby proposes, and agrees that if its bid is accepted by the City, Contractor will provide all necessary machinery, tools, apparatuses, and other means of construction, and to do all the work and furnish all the materials and services required to complete the construction in accordance with the Contract, the Special Provisions, the Project Plan(s), and Addenda to any of the above as incorporated by reference, in the time stated herein, for the unit prices and/or lump sum prices as follows:

**CITY OF SANTA ROSA
UNIT PRICE SCHEDULE
ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE PROTECTION**

NAME OF BIDDER: _____

No.	Item	Quantity	Units	Unit Price	Total Price
1	ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE PROTECTION	1	LS	\$ _____	\$ _____

GRAND TOTAL BID \$ _____

In the case of any discrepancy between the unit price and the total set forth for the item, the unit price shall prevail; provided, however, that if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any reason, or is omitted, or in the case of lump sum items, is not the same amount as the entry in the "Total" column, then the amount set forth in the "Total" column for the item shall prevail in accordance with the following:

1. As to lump sum items, the amount set forth in the "Total" column shall be the unit price;
2. As to unit basis items, the amount set forth in the "Total" column shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price.

The Total Base Bid shall be the sum of the "Total" column. In case of discrepancy between the sum of the "Total" column and the amount entered as Total Base Bid, the sum of the "Total" column shall prevail. The bid comparison will be based on the sum of the "Total" column for each bidder.

If this Contract Bid is accepted by the City and the undersigned fails to execute the Contract and to give all the bonds required under the Contract, with a surety satisfactory to the Award Authority of the City of Santa Rosa, within ten calendar days after bidder has received the Notice of Award from the Engineer, then the Award Authority may, at its option, determine that the bidder has abandoned the Contract, and thereupon this bid and the acceptance thereof shall be null and void, and the forfeiture of the security accompanying this bid shall be in accordance with California Public Contract Code section 20172.

The undersigned understands and agrees that the City is not responsible for any error or omissions on the part of the undersigned in making this bid.

The bidder to whom the Contract is awarded agrees to execute the Contract in favor of the City, in the form attached, and to deliver any and all required bond(s) and insurance certificates within ten calendar days from the date of Contractor's receipt of the Notice of Award. Following the award of the Contract, Contractor shall commence work within ten calendar days from the day authorized in the Notice to Proceed and diligently prosecute the same to completion in accordance with Section 8-1.04.

LIST OF SUBCONTRACTORS

NAME OF BIDDER: _____

The following is a list of each subcontractor who will perform work or labor or render services to the undersigned for the construction of the project in an amount in excess of ½ of 1% of the total amount of this bid.

The undersigned agrees that any portion of the work in excess of ½ of 1% of the total amount of this bid and for which no subcontractor is designated herein will be performed by the undersigned.

SUBCONTRACTOR NAME	SUBCONTRACTOR LICENSE NUMBER	SUBCONTRACTOR DIR REGISTRATION NUMBER	SUBCONTRACTOR BUSINESS ADDRESS	DESCRIPTION OF WORK (ITEM NO.)

LIST OF PREVIOUS SIMILAR JOBS

NAME OF BIDDER: _____

[illegible]

NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid. The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], _____ [state].

NOTE: The above Noncollusion Declaration is part of the Contract Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Noncollusion Declaration.

BID BOND AFFIDAVIT AND BIDDER'S SIGNATURE PAGE

Accompanying this bid is a guaranty in the form of (Notice: Insert the words "cash \$," "Cashier's Check," "Certified Check," or "Bidder's Bond" as the case may be):

in an amount equal to at least ten percent of the total of this bid.

The undersigned further agrees that if Contractor does not execute the Contract and deliver the necessary bonds to the City within the period of time specified in this Invitation for Bids, the proceeds of the security accompanying this bid shall become the property of the City of Santa Rosa, California, and this bid and the acceptance thereof may, at the option of the City, be considered null and void.

The undersigned is licensed in accordance with an act providing for the registration of Contractors, License No. _____, Class _____, expiration date _____.

The undersigned is registered with the Department of Industrial Relations, Registration No. _____.

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager of the corporation; if a partnership, state true name of partnership, also the names of all partners in the partnership; if the bidder is a sole proprietor, state the business name and the proprietor's name in full.

Secretary of State Business Entity Number: _____.

Business Address

Telephone Number

I declare under penalty of perjury that the foregoing is true and correct.

BIDDER'S SIGNATURE: _____

TITLE: _____

DATE: _____

CONTRACT

CITY OF SANTA ROSA

CALIFORNIA

CONTRACT NO. C02012

ALPHA FARM BIOSOLIDS STORAGE FACILITY FIRE SPRINKLER SYSTEM FREEZE PROTECTION

This Contract is made and entered into as of date to be added upon award at Santa Rosa, California, between the City of Santa Rosa ("City") and _____ of _____ ("Contractor").

ARTICLE I - For and in consideration of the payment and agreement hereinafter mentioned, to be made and performed by City, and under the conditions expressed in the required bonds hereunto annexed, Contractor agrees that for the benefit of City, at its own cost and expense, to do all the work and furnish all the materials, except such as are mentioned in the Special Provisions to be furnished by City, necessary to construct and complete the work herein described in a good, workmanlike, and substantial manner. The work embraced herein shall be done in accordance with the Standard Specifications of the State of California Department of Transportation, dated 2010, insofar as the same may apply (Standard Specifications); in accordance with the City of Santa Rosa Construction Specifications for Public Improvements (City Specifications); in accordance with the City of Santa Rosa Design and Construction Standards, (City Standards); in accordance with the State of California Department of Transportation Standard Plans, dated 2010 (Standard Plans), (collectively, "Contract Documents") and in accordance with the Special Provisions hereinabove set forth, all of which are hereby incorporated into and made part of this Contract.

The work to be performed is further shown upon a plan consisting of 5 sheets entitled, Alpha Farm Biosolids Storage Facility Fire Sprinkler System Freeze Protection, File Number 2016-0038, approved by the Deputy Director of Transportation and Public Works, hereinafter referred to as the Project Plan(s).

ARTICLE II - Contractor agrees to receive and accept the following prices as full compensation for furnishing all materials and doing all the work contemplated and embraced in this Contract; also for all loss or damages arising out of the nature of the work aforesaid, or from the acts of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by City and for all expenses incurred by or in consequence of the suspension or discontinuance of work, and for well and faithfully completing the work, and the whole thereof in the manner and according to the Project Plans and Invitation for Bids therefor, and the requirements of the Engineer under them to wit:

ITEM NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
			\$ _____	\$ _____
TOTAL BASE BID (SUM OF "TOTAL" COLUMN)			\$ _____	

**BID ITEMS IN THIS SECTION WILL BE INSERTED
UPON AWARD OF THE CONTRACT AND SHALL BE
THE SAME AS THOSE BID UPON.**

ARTICLE III - City and Contractor hereby promise and agree that Contractor shall provide the materials and do the work according to the terms and conditions herein contained and referred to, for the prices aforesaid, and City hereby agrees to pay for the same at the time, in the manner, and upon the conditions set forth; and the parties for themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to full performance of the covenants herein stated.

ARTICLE IV - By execution of this Contract, Contractor hereby represents and certifies that Contractor is aware of the provisions of Labor Code section 3700 which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor hereby agrees to comply with such provisions before commencing the performance of the work of this Contract.

ARTICLE V - It is further expressly agreed by and between the parties hereto that the Invitation for Bids, containing the Notice to Bidders including any required Bonds, the Contract Documents, and any Addenda are all essential parts of this Contract and are specially referred to and by such reference made a part hereof. In the event of any conflict in the provisions thereof, the terms of said documents shall control each over the other, in the following order:

1. Special Provisions
2. Project Plans
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

ARTICLE VI - Contractor agrees to commence work pursuant to this Contract within ten calendar days from the date authorized in the Notice to Proceed and to diligently prosecute the same to completion in accordance with Section 8-1.04C of the Special Provisions.

This Contract shall not be transferred or assigned without the prior written consent of City, which may be withheld by City in its sole and absolute discretion.

If Contractor is a corporation, two corporate officers of Contractor, one from each of the following two groups shall execute this Contract: a) the chairman of the board, president or any vice-president; b) the secretary, any assistant secretary, chief financial officer, or any assistant treasurer. The name and title of the corporate officers shall be printed under the signature.

In witness whereof, the parties hereto have executed this Contract as of the date first written above.

City:

City of Santa Rosa,
a Municipal corporation

By: _____

Title: _____

ATTEST:

By: _____

Title: _____

Approved as to form:

By: _____

Office of City Attorney

Contractor:

Name of Contractor,
Type of entity

By: _____

Name: _____

Title: _____

By: _____

Name: _____

Title: _____