THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS
ACTION AGENDA SUMMARY

DEPT: PUBLIC WORKS

Urgent_____ Routine ✓

CEO Concurs with Recommendation YES____ NO____
(Information Attached)

BOARD AGENDA # *C-8

AGENDA DATE JUNE 5, 2001

4/5 Vote Required YES____ NO ✓

SUBJECT:

APPROVAL OF PLANS AND SPECIFICATIONS FOR THE LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION PROJECT AT THE FINK ROAD LANDFILL

STAFF RECOMMENDATIONS:

1. APPROVE THE PLANS AND SPECIFICATIONS FOR THE LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION PROJECT AT THE FINK ROAD LANDFILL;

2. AUTHORIZE THE CLERK OF THE BOARD TO SCHEDULE THE DATES FOR ADVERTISING JUNE 13, AND 20, 2001, AND SET THE BID OPENING FOR JUNE 27, 2001 AT 2:45 P.M., AND;

3. AUTHORIZE THE AUDITOR TO INCREASE APPROPRIATIONS PER ATTACHED BUDGET JOURNAL SHEET.

FISCAL IMPACT:

All funds for this transaction are accounted for within the Fink Road Landfill.

BOARD ACTION AS FOLLOWS:

No. 2001-401

On motion of Supervisor Simon , **Seconded by Supervisor** Caruso
and approved by the following vote,
Ayes: Supervisors: Mayfield, Blom, Simon, Caruso, and Chair Paul
Noes: Supervisors: None
Excused or Absent: Supervisors: None
Abstaining: Supervisor: None

1) X **Approved as recommended**
2) _____ **Denied**
3) _____ **Approved as amended**

Motion:

Christine Ferraro

ATTEST: CHRISTINE FERRARO TALLMAN, Clerk **By: Deputy** **File No.**

1010-08

DISCUSSION: The work consists of site preparation for the construction of the blower/flare facility. This includes the construction of vertical landfill gas extraction wells, installation of landfill gas collection and control system piping, blower/flare facility, condensate collection, and disposal system. The gas collection system is being constructed to facilitate the future collection of gas for beneficial uses. The engineer's estimate for construction is $811,110 plus an advertising cost of $2,000.

POLICY ISSUE: This action is consistent with the Board of Supervisors' goal of providing a safe, healthy community.

STAFFING IMPACT: There is no staffing impact associated with this item.

RG:dh
(L:\landfill\63 016\AppP&SBos.wpd)

AUDITOR - CONTROLLER
COPY

AUDITOR-CONTROLLER
BUDGET JOURNAL

Stanislaus County
Striving to be the Best

Budget Organization: **Stanislaus Budget Org**
Budget: **LEGAL BUDGET**
Accounting Period From: Jul-00
To: Jun-01

Department of Public Works
STANISLAUS COUNTY

BATCH SCREEN

Journal Batch: **PW - LW** BO --
Category: **Budget**

Line	Coding Structure: Fund 4	Org 7	Account 5	G/L Proj 7	Loc 6	Misc 6		Period May-01 AMOUNT	Description
1	4021	41100	63280	9343	0	0	.0	813,110.00	Increase Approp
2							.0		
3							.0		
4							.0		
5							.0		
6							.0		
7							.0		
8							.0		
9							.0		
10							.0		
11							.0		
12							.0		
13							.0		
14							.0		
15							.0		
16							.0		
17							.0		
18							.0		
19							.0		
20							.0		
21							.0		
22							.0		
23							.0		
24							.0		
25							.0		
						Totals		813,110.00	

Explanation:
Increase Appr for Fink Road landfill gas project

Requesting Department	CEO	Auditors Office Only	
Larry Wendel			
Signature	Signature	Approved By	Admin Approval ($75K+)
07-May-01		5/10/01	
Date	Date	Date	Date

CONTRACT DOCUMENTS
FOR

LANDFILL GAS COLLECTION AND CONTROL SYSTEM AT THE FINK ROAD LANDFILL

CONTRACT DOCUMENTS

AND

SPECIAL PROVISION

Prepared for County of Stanislaus

February 2001

Prepared by

EMCON/OWT Solid Waste Services
1921 Ringwood Avenue
San Jose, California 95131
(408) 453-7300
Project 809722

CONTRACT DOCUMENTS

AND SPECIFICATIONS FOR

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

IN

STANISLAUS COUNTY

OWNER - STANISLAUS COUNTY

BOARD OF SUPERVISORS

PAT PAUL, CHAIR	DISTRICT NO. 1
THOMAS W. MAYFIELD	DISTRICT NO. 2
NICK W. BLOM	DISTRICT NO. 3
RAY SIMON	DISTRICT NO. 4
PAUL CARUSO	DISTRICT NO. 5

REAGAN WILSON -- CHIEF EXECUTIVE OFFICER

GEORGE STILLMAN -- DIRECTOR OF PUBLIC WORKS

MAY, 2001

LANDFILL GAS COLLECTION AND CONTROL SYSTEM

AT THE

FINK ROAD LANDFILL

The Special Provisions contained herein have been prepared by or under the direction of the following registered person.

Andrew P. Wang

Signature

4/23/01

Date

NOTICE TO CONTRACTORS

Contractors are invited to submit written, formal bids for

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

Bids envelopes must be delivered to the Clerk of the Board of Supervisors, Tenth Street Place, Joint Stanislaus County/City of Modesto Administration Building, 1010 10th Street, Modesto, CA, located on the Sixth Floor of Tenth Street Place, **PRIOR TO 2:45 P.M. ON JUNE 27, 2001**, as evidenced by the date/time stamp on the envelope by the Clerk. After bid opening, the bids will be publicly opened and read by the Clerk in the Lobby Conference Room located on the Sixth Floor of Tenth Street Place.

Bid shall be submitted in sealed envelopes on the forms provided with the plans and specifications for that purpose. Envelopes shall be addressed to the Clerk of the Board of Supervisors, Tenth Street Place, Joint Stanislaus County/City of Modesto Administration Building, 1010 10th Street, Sixth Floor, Modesto, CA 95354, and plainly marked:

"LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION"

The work consists of construction of for the Landfill Gas Collection and Control System and includes a site preparation for the construction of the Blower/Flare Facility. Construction of vertical landfill gas extraction wells, installation of landfill gas collection and control system piping, blower/flare facility, condensate collection, and disposal system.

Proposal, Plans, and Specifications are available at the Department of Public Works Office, 1716 Morgan Road, Modesto, CA 95358, upon the receipt of $10.00 **(NON-REFUNDABLE)** fee (make checks payable to: "STANISLAUS COUNTY PUBLIC WORKS") during the office hours of 7:30 a.m. to 12:00 p.m. and from 1:00 p.m. to 5:00 p.m., Monday through Friday. For any questions, please call the Public Works, **ENGINEERING DIVISION AT (209) 525-4193**. For **technical questions**, please contact Michael Franck at the Public Works, Fink Road Landfill Division, County of Stanislaus, Crows Landing, CA at (209) 837-4804.

Your particular attention is directed to the "Information for Bidders" and "General Conditions" included in the specifications, which is to be followed in all respects. In particular, your attention is directed to the handicapped, non-discrimination clause contained in the General Conditions, Section 2.47, which complies with Section 504 of the Rehabilitation Act of 1973. A bidders bond or its equivalent will be required.

Pursuant to Sections 1770 and 1773 of the Labor Code, the Board of Supervisors has ascertained the general prevailing rate of per diem wages applicable to the work to be done for straight time, overtime, Saturday, Sunday, and holiday work. These wage rates are set forth by the Director of the Department of Industrial Relations now on file with the Department of Public Works, and which are a part of the contract.

By order of the Board of Supervisors of the County of Stanislaus, State of California, made and entered this June 5, 2001.

ATTEST CHRISTINE FERRARO TALLMAN
Clerk of the Board of Supervisors of the
County of Stanislaus, State of California

By_____
Deputy Clerk

1.00 INFORMATION FOR BIDDERS.

1.01 DATE AND PLACE FOR OPENING PROPOSALS. Pursuant to the "Invitation to Bidders", sealed proposals for performing the work will be received by the Purchasing Agent of Stanislaus County.

At the place and time set forth in said notice, they will be publicly opened and read. Said Board of Supervisors, if awarded, will make the awarding of the contract, as soon thereafter as practicable.

1.02 PRINTED FORM OF PROPOSALS. All proposals must be made upon the blank Form of Proposal attached hereto, and should give the price data in figures, and must be signed by the bidder. In accordance with the directions in the Form of Proposal, in order to insure consideration the proposal should be enclosed in a return envelope furnished by the bidder, and plainly marked: Proposal For

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

and addressed to the Board of Supervisors of Stanislaus County, City/County Administration Building, 1010 10th Street, Modesto, California 95354. No bid may be withdrawn within 30 days after time of opening.

1.03 OMISSIONS AND DISCREPANCIES. Should a bidder find discrepancies in, or omissions from, the drawings or other contract documents, or should he be in doubt as to their meaning, he should at once notify the Engineer who may send a written instruction to all bidders.

1.04 ACCEPTANCE OR REJECTION OF PROPOSALS. The Board of Supervisors reserves the right to reject any or all proposals. Without limiting the generality of the foregoing, any proposal, which is incomplete, obscure, or irregular, may be rejected. Any proposal having erasures or corrections in the price sheet may be rejected. Any proposal, which omits a bid on any one or more items in the price sheet, may be rejected. Any proposal in which unit prices are obviously unbalanced may be rejected. Any proposal accompanied by an insufficient or irregular bidder's bond may be rejected. Any proposal, which does not include and have attached a list of all subcontractors, complete with names and addresses, may be rejected.

Also, the Board of Supervisors reserves the right to reject the proposal any bidder who is not responsible. The successful bidder shall be licensed by the State of California to perform the work required by the plans and specifications and shall endorse his license number on the proposal. The Board may require additional evidence of experience, financial responsibility, or corporate existence, at its option. Each bidder shall endorse his address to, which notices hereunder may be directed on the proposal.

A bidder may be deemed not to be responsible and his bid rejected if a listed subcontractor is not responsible. Responsibility of any bidder or of any listed subcontractor shall be determined at the sole discretion of the Board.

1.05 CASH, CERTIFIED CHECK, CASHIER'S CHECK OR BIDDER'S BOND. All proposals shall be accompanied by cash, a certified check, certified to by some responsible bank or banker, a cashier's check on a bank, or a bidder's bond prepared and guaranteed by an admitted corporate surety made payable to the "County of Stanislaus" in the amount of ten percent (10%) of the total bid, unless otherwise specified. All such cash or checks will be returned to the respective bidder within ten (10) days after the proposals are opened, except those, which the Board of Supervisors elects to hold until the successful bidder has executed the contract. Thereafter, all remaining cash or checks, including that of the successful bidder, will be returned within five (5) days.

1.06 ACCEPTANCE OF PROPOSALS AND ITS EFFECT. Within 30 days after the opening of the proposals, the Board of Supervisors will act upon them. The acceptance of a proposal will be notice in writing signed by a duly authorized representative of the Board of Supervisors and no other act of the Board of Supervisors shall constitute the acceptance of a proposal. The acceptance of a proposal shall bind the successful bidder to execute the contract and to be responsible for liquidated damages, as provided in Paragraph 1.07. The rights and obligations provided for in the contract shall become effective and binding upon the parties only with its formal execution by the Board of Supervisors.

1.07 TIME FOR EXECUTING CONTRACT AND DAMAGES FOR FAILURE TO EXECUTE. Any bidder whose proposal shall be accepted will be required to execute the contract within 15 days after the date that the contract documents are mailed to him by the Department of Public Works. Failure or neglect to do so shall constitute a breach of the agreement effected by the acceptance of the proposal.

The damages to the County for such breach will include loss from interference with its construction program and other items whose accurate amount will be difficult or impossible to compute. The amount of the cash, certified check, cashier's check or bidder's bond accompanying the proposal of such bidder shall be forfeited and applied by the Board of Supervisors as liquidated damages for such breach. In the event any bidder whose proposal shall be accepted shall fail or refuse to execute the contract as accepted as hereinbefore provided, the Board of Supervisors may, at its option, determine that such bidder has abandoned the contract and thereupon his proposal and the acceptance thereof shall be null and void and the County shall be entitled to liquidated damages as provided in the General Conditions. In such event, the Board of Supervisors may award the contract to the next low responsible bidder or bidders.

1.08 DETERMINATION OF LOW BIDDER. Except where the Board of Supervisors exercises the right reserved herein to reject any or all proposals, the contract will be awarded by said Board of Supervisors to the bidder who has submitted the lowest responsible bid determined by lowest unit price based on the quantities given in the schedule. Quantities are approximate, only being as a basis for the

comparison of bids. The Board of Supervisors reserves the right to increase, decrease or omit portions of the work as may be deemed necessary or advisable by the Engineer.

1.09 TIME FOR BEGINNING AND COMPLETING THE WORK. The Contractor shall commence the work within five (5) calendar days after the date specified in the Notice to Proceed given to him by the Board of Supervisors to commence work, and he shall complete the work within the specified time. The date of the Notice to Proceed shall constitute the first working day.

1.10 PRICES. The prices are to include the furnishing of all materials, plant, equipment, tools, scaffolds, and all other facilities, and the performance of all labor and services necessary for proper completion of the work, except such as may be otherwise expressly provided in the contract documents.

1.11 INTERPRETATION OF ADDENDA. Oral interpretations shall not be made to any bidder as to the meaning of any of the contract documents, or be effective to modify any of the provisions of the contract documents. Every request for an interpretation shall be made in writing, addressed and forwarded to the Director of Public Works, 1010 10th Street, Modesto, California 95354.

1.12 RIGHT TO MAKE CORRECTIONS. The Engineer/Architect shall have the right to make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the specifications. The Contractor shall be responsible for calling apparent errors or omissions to the attention of the Engineer/Architect for his corrections and/or interpretation. The Contractor shall not take advantage of said apparent errors or omissions.

1.13 SUBSTITUTIONS OF SECURITIES FOR WITHHELD PAYMENTS. Except as otherwise prohibited by law, the Contractor may elect to receive all payments due under the contract pursuant to Section 2.13 without any retention. If the Contractor so elects, he shall deposit with the County securities with a value equal to the monies, which would otherwise be withheld by the County. Said securities shall be as provided in Section 22300 of the Public Contract Code and shall be approved by the County as to both sufficiency and form.

FORM OF PROPOSAL

HONORABLE BOARD OF SUPERVISORS
STANISLAUS COUNTY, CALIFORNIA

The undersigned bidder has examined the site and all of the documents, plans and specifications for

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

The bidder will perform all work and provide all labor, equipment and materials for the completion and operation of the project for which this proposal is made, all as set forth on the plans and in the specifications, provided by the Director of the Department of Public Works or other specified agent of the Stanislaus County Board of Supervisors, at bid amounts as stated attached:

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

ENGINEER ESTIMATE

Item No.	Item Description	Unit of Measure	Estimated Quantity	Unit Price (In figures)	Total (In Figures)
1.	Mobilization and Demobilization	L.S.	L.S.	$_____	$_____
	LFG BLOWER/FLARE FACILITY				
2.	Earthwork, including Clearing & Grubbing	L.S.	L.S.	$_____	$_____
3.	Area Grading and Surfacing	L.S.	L.S.	$_____	$_____
4.	Cast-In-Place Reinforced Concrete for LFG Equipment Foundation, Condensate Storage Tank Foundation and Containment Wall	L.S.	L.S.	$_____	$_____
5.	Fence and Gates	L.S.	L.S.	$_____	$_____
	VERTICAL LFG EXTRACTION WELLS				
6.	Well Drilling, 4" Vertical Pipe Installation, and Well Completion, including on-site Disposal/Trucking of Well Cuttings	L.F.	950	$_____	$_____
7.	Wellhead Piping, Flexible Hose, Fittings, Valves, and Monitoring Ports	Each.	22	$_____	$_____
	PIPELINE INSTALLATION				
8.	1-1/2" Air Header and Fittings, Below Ground Installation, Same Trench as LFG Pipeline	L.F.	2,210	$_____	$_____
9.	2" Force Main Pipe and Fittings, Below Ground Installation, Same Trench as LFG Pipeline				
10.	4" LFG Pipe and Fittings, Above Ground Installation, Including Road Crossing	L.F.	1,100	$_____	$_____
11.	6" LFG Pipe and Fittings, Above Ground Installation, Including Road Crossing	L.F.	3,000	$_____	$_____
12.	8" LFG Pipe and Fittings, Above Ground Installation	L.F.	240	$_____	$_____
13.	8" LFG Pipe Fittings, Below Ground Trench Installation, Including Road Crossing	L.F.	590	$_____	$_____
14.	10" LFG Pipe and Fittings, Below Ground Trench Installation, Including Road Crossing	L.F.	1,070	$_____	$_____
15.	12" LFG Pipe, Fittings, and Sand Bedding, Below Ground Trench Installation, Including Road Crossing	L.F.	500	$_____	$_____

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

ENGINEER ESTIMATE (Continued Page 2)

Item No.	Item Description	Unit of Measure	Estimated Quantity	Unit Price (In figures)	Total (In Figures)
16.	12" LFG Pipe and Fittings, Bore, and Jack Road Crossing	L.S.	L.S.	$_____	$_____
	ISOLATION VALVES				
17.	6" Isolation Valve, Above Ground	Each	3	$_____	$_____
18.	8" Isolation Valve, Below Ground, Including Vault, Stem Extension and Casing, and Backfill Material and Placement	Each	1	$_____	$_____
19.	12" Isolation Valve, Below Ground, Including Vault, Stem Extension and Casing, and Backfill Material and Placement	Each.	1	$_____	$_____
20.	Flanged Header Stubout with Monitoring Port, Including Steel Guard Post Installation	Each	9	$_____	$_____
	CONDENSATE SYSTEM				
21.	Condensate Sump, Including Pump, Piping Fitting, Appurtenances, Valve Box, Backfill, Bentonite Seal, Delivery, and Installation	Each	2	$_____	$_____
22.	15 HP Air Compressor and Air Refrigerant Dryer, Including Piping, Fittings, Gauges, Appurtenances, Delivery, and Installation	Each	1	$_____	$_____
23.	Condensate Injection System	Each	1	$_____	$_____
24.	1100 Gallon Condensate Storage Tank, Including Piping, Fittings, Valves, Gauges, Appurtenances, Pipe Supports, Delivery and Installation	Each	1	$_____	$_____
	LFG BLOWER AND FLARE UNITS				
25.	Enclosed 1200 cfm Flare Unit Including Main Control Rack, Flow Meter, Fail Close Valve, Piping, Fittings, Valves, Appurtenances, Delivery and Installation Estimated at 7% of Pipeline Cost to be Provided at Cost Plus 10%	Each	1	$_____	$_____
26.	Blower Ski with Two Identical Blowers and Flow Meter, Piping, Fittings, Valves, Appurtenances, Delivery and Installation	Each	1	$_____	$_____

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

ENGINEER ESTIMATE (Continued Page 3)

Item No.	Item Description	Unit of Measure	Estimated Quantity	Unit Price (In figures)	Total (In Figures)
27.	Startup and Testing	Days	4	$_____	$_____
	LFG ELECTRICAL SYSTEM				
28.	Power, Lighting, Grounding, and Communications	L.S.	L.S.	$_____	$_____
29.	Testing	Days	4	$_____	$_____
	ENGINEERING DOCUMENTATION				
30.	Surveying (Staking and As Built)	L.S.	L.S.	$_____	$_____
31.	As Built Plans 12" (in vault)	L.S.	L.S.	$_____	$_____
	SUPPLEMENTAL FUNDS				$ 80,000.00
				PROJECT TOTAL	$_____

ADDENDUM NO. _____ DATED _____ DATE RECEIVED _____ INITIALS_____

ADDENDUM NO. _____ DATED _____ DATE RECEIVED _____ INITIALS_____

ADDENDUM NO. _____ DATED _____ DATE RECEIVED _____ INITIALS_____

CONTRACTOR _____

ADDRESS _____

PHONE ( ) _____ FAX ( ) _____

(L:\landfill\63 016\EngrEst.wpd)

The undersigned also agrees as follows:

1. Within eight (8) working days from date of the notice of acceptance of proposal, the Contractor shall execute the contract and furnish to the Purchasing Agent of Stanislaus County satisfactory insurance and contract bonds guaranteeing the faithful performance of the work and General Conditions thereto.

2. To begin work on the date specified in the Notice to Proceed and to prosecute said work in such a manner as to complete it within

"ONE HUNDRED AND TWENTY (120) WORKING DAYS"

The work shall be so scheduled that existing facilities shall not be disrupted, but shall remain in continuous operation on present schedules.

Accompanying this proposal is a bidder's bond issued by a California admitted surety, certified or cashier's check, or cash in the amount of ten percent (10%) of the proposal, made payable to Stanislaus County, which bond or check is to be retained as liquidated damages should the undersigned be awarded the contract and fail to execute the contract and furnish satisfactory bonds according to the conditions herein specified; otherwise said bidder's bond or check will be returned.

Dated:_____

Bidder:_____

By_____

_____

_____

Address:_____

_____

Telephone:_____Classification_____License_____

License Expiration Date_____

If incorporated, President, Secretary or Treasurer should sign as such. If partnership, by all partners thereto.

Each proposal shall have listed therein the name and address of each subcontractor to whom the bidder proposes to subcontract portions of the work in an amount in excess of half of one percent of his total bid or $10,000, whichever is greater, in accordance with the subletting and Subcontracting Fair Practices Act, commencing the Section 4100 of the Public Contract Code. The Bidder's attention is invited to other provisions of said Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

TYPE OF SUBCONTRACT	LICENSE NO.	NAME & ADDRESS OF SUBCONTRACTOR
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		

(Signed)_____
Contractor

_____
Printed or Typed Name

STANISLAUS COUNTY

NON-DISCRIMINATION OF THE HANDICAPPED

POLICY STATEMENT

In compliance with Section 51.55, Office of Revenue Sharing, Department of the Treasury, it is the policy of Stanislaus County that it will not aid or perpetuate discrimination against a qualified handicapped individual by funding an agency, organization, or person that discriminates on the basis of handicap in providing any aid, benefit, or service to beneficiaries of the program or activity.

The County is committed to provide access to all County services, programs and meetings open to the public to people with disabilities.

In this regard, County and all of its contractors and subcontractors will take all reasonable steps in accordance with GRS Section 51.55 to ensure that handicapped individuals have the maximum opportunity for the same level of aid, benefit or service as any other individual.

CERTIFICATION

Each agency, organization, or person seeking a bid, contract or agreement with Stanislaus County shall sign a Certification of Compliance with Section 504 of the Rehabilitation Act of 1973 as incorporated in the Revenue Sharing Act.

CERTIFICATION OF BIDDER REGARDING NON-DISCRIMINATION OF THE HANDICAPPED

The bidder hereby certifies that he/she/it is in compliance with Section 504 of the Rehabilitation Act of 1973 as incorporated in the Revenue Sharing Act, the applicable administrative requirements promulgated in response thereto, and any other applicable Federal laws and regulations relating to handicap discrimination and participation.

Name of Bidder_____

Business Address_____Telephone_____

City, State, Zip Code_____

By_____ Title_____
(Signature)

Printed Name _____
Date_____

sj\:L:\landfill\63 016\Contract.doc\409-99\aw:1

To the County of Stanislaus, Public Works Department,

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

(Title 23 United States Code Section 112 and
Public Contract Code Section 7106)

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly on indirectly colluded, conspired, connived or agreed with any bidder or anyone else to put in a sham bid or that anyone shall refrain from bidding; that 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, or to secure any advantage against the public body awarding the contract of any one interested in the proposed contract; that all statements contained in the bid are true; and, further, that 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, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Note: The above Non-collusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Non-collusion Affidavit.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Form **W-9**
(Rev. March 1994)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do NOT send to the IRS.

Name (If joint names, list first and circle the name of the person or entity whose number you enter in Part I below. **See instructions on page 2 if your name has changed.**)

Please print or type

Business name (Sole proprietors see instructions on page 2.)

Please check appropriate box: ☐ Individual/Sole proprietor ☐ Corporation ☐ Partnership ☐ Other ►

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. For individuals, this is your social security number (SSN). For sole proprietors, see the instructions on page 2. For other entities, it is your employer identification number (EIN). If you do not have a number, see **How To Get a TIN** below.

Note: *If the account is in more than one name, see the chart on page 2 for guidelines on whose number to enter.*

Social security number

OR

Employer identification number

List account number(s) here (optional)

Part II

For Payees Exempt From Backup Withholding (See **Part II instructions** on page 2)

►

Part III Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), **and**
2. I am not subject to backup withholding because: **(a)** I am exempt from backup withholding, or **(b)** I have not been notified by the Internal Revenue Service that I am subject to backup withholding as a result of a failure to report all interest or dividends, or **(c)** the IRS has notified me that I am no longer subject to backup withholding.

Certification Instructions.—You must cross out item **2** above if you have been notified by the IRS that you are currently subject to backup withholding because of underreporting interest or dividends on your tax return. For real estate transactions, item **2** does not apply. For mortgage interest paid, the acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. (Also see **Part III instructions** on page 2.)

Sign Here **Signature ►** **Date ►**

Section references are to the Internal Revenue Code.

Purpose of Form.—A person who is required to file an information return with the IRS must get your correct TIN to report income paid to you, real estate transactions, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA. Use Form W-9 to give your correct TIN to the requester (the person requesting your TIN) and, when applicable, (1) to certify the TIN you are giving is correct (or you are waiting for a number to be issued), (2) to certify you are not subject to backup withholding, or (3) to claim exemption from backup withholding if you are an exempt payee. Giving your correct TIN and making the appropriate certifications will prevent certain payments from being subject to backup withholding.

Note: *If a requester gives you a form other than a W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.*

What Is Backup Withholding?—Persons making certain payments to you must withhold and pay to the IRS 31% of such payments under certain conditions. This is called "backup withholding." Payments that could be subject to backup withholding include interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

If you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return, your payments will not be subject to backup withholding. Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester, or
2. The IRS tells the requester that you furnished an incorrect TIN, or
3. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
4. You do not certify to the requester that you are not subject to backup withholding under 3 above (for reportable interest and dividend accounts opened after 1983 only), or
5. You do not certify your TIN. See the Part III instructions for exceptions.

Certain payees and payments are exempt from backup withholding and information reporting. See the Part II instructions and the separate **Instructions for the Requester of Form W-9.**

How To Get a TIN.—If you do not have a TIN, apply for one immediately. To apply, get **Form SS-5,** Application for a Social Security Number Card (for individuals), from your local office of the Social Security Administration, or **Form SS-4,** Application for Employer Identification Number (for businesses and all other entities), from your local IRS office.

If you do not have a TIN, write "Applied For" in the space for the TIN in Part I, sign and date the form, and give it to the requester. Generally, you will then have 60 days to get a TIN and give it to the requester. If the requester does not receive your TIN within 60 days, backup withholding, if applicable, will begin and continue until you furnish your TIN.

Note: *Writing "Applied For" on the form means that you have already applied for a TIN* ***OR*** *that you intend to apply for one soon.*

Soon as you receive your TIN, complete another Form W-9, include your TIN, sign and date the form, and give it to the requester.

Penalties

Failure To Furnish TIN.—If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil Penalty for False Information With Respect to Withholding.—If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal Penalty for Falsifying Information.— Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs.—If the requester discloses or uses TINs in violation of Federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name.—If you are an individual, you must generally enter the name shown on your social security card. However, if you have changed your last name, for instance, due to marriage, without informing the Social Security Administration of the name change, please enter your first name, the last name shown on your social security card, and your new last name.

Sole Proprietor.—You must enter your **individual** name. (Enter either your SSN or EIN in Part I.) You may also enter your business name or "doing business as" name on the business name line. Enter your name as shown on your social security card and business name as it was used to apply for your EIN on Form SS-4.

Part I—Taxpayer Identification Number (TIN)

You must enter your TIN in the appropriate box. If you are a sole proprietor, you may enter your SSN or EIN. Also see the chart on this page for further clarification of name and TIN combinations. If you do not have a TIN, follow the instructions under **How To Get a TIN** on page 1.

Part II—For Payees Exempt From Backup Withholding

Individuals (including sole proprietors) are **not** exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends. For a complete list of exempt payees, see the separate Instructions for the Requester of Form W-9.

If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding. Enter your correct TIN in Part I, write "Exempt" in Part II, and sign and date the form. If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester a completed **Form W-8,** Certificate of Foreign Status.

Part III—Certification

For a joint account, only the person whose TIN is shown in Part I should sign.

1. Interest, Dividend, and Barter Exchange Accounts Opened Before 1984 and Broker Accounts Considered Active During 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, Dividend, Broker, and Barter Exchange Accounts Opened After 1983 and Broker Accounts Considered Inactive During 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item **2** in the certification before signing the form.

3. Real Estate Transactions. You must sign the certification. You may cross out item **2** of the certification.

4. Other Payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified of an incorrect TIN. Other payments include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services, payments to a nonemployee for services (including attorney and accounting fees), and payments to certain fishing boat crew members.

5. Mortgage Interest Paid by You, Acquisition or Abandonment of Secured Property, Cancellation of Debt, or IRA Contributions. You must give your correct TIN, but you do not have to sign the certification.

Privacy Act Notice

Section 6109 requires you to give your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 31% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship	The owner [3]
For this type of account:	**Give name and EIN of:**
6. Sole proprietorship	The owner [3]
7. A valid trust, estate, or pension trust	Legal entity [4]
8. Corporate	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

[1] List first and circle the name of the person whose number you furnish.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name, but you may also enter your business or "doing business as" name. You may use either your SSN or EIN.

[4] List first and circle the name of the legal trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.)

Note: *If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.*

U.S. GOVERNMENT PRINTING OFFICE: 1994 345-126

BIDDER'S BOND

COUNTY OF STANISLAUS
DEPARTMENT OF PUBLIC WORKS

We, as Principal, and_____ as Surety are bound unto the County of Stanislaus, Department of Public Works, hereinafter referred to as "Obligee", in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which we bind ourselves, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Principal is submitting a bid to the Obligee, for

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

for the bids are to be opened at Modesto, California on _____*(Date of Bid Opening)*

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in force.

In the event suit is brought upon this bond by the Obligee and judgement is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: _____, 20_____.

Principal

Surety

By

Attorney-in-Fact

CERTIFICATE OF ACKNOWLEDGMENT

State of California
County of _____SS
On this_____ day of _____ in the year 20 ____ , before me, a notary public in and for the county and state aforesaid, personally appeared _____ known to me to be the person whose name is subscribed to this instrument and known to me to be the attorney-in-fact of _____ and acknowledged to me that he subscribed the name of said company thereto as surety, and his own name as attorney-in-fact.

(seal)

_____Notary Public

sj\:L:\landfill\63 016\Contract.doc\409-99\aw:1

FORM OF CONTRACT BOND
(RECOMMENDED)

FAITHFUL PERFORMANCE

Know All Men by These Presents:

That Whereas

as Contractor and Principal, and

as Surety, are held and firmly bound unto the County of Stanislaus, State of California, Obligee, in the sum of

($) lawful money of the United States of America, for the payment whereof well and truly to be made we and each of us, jointly and severally, bind ourselves, our heirs, executors, administrators, successors and assigns, firmly by these presents.

The condition of the above obligation is such that whereas the above bounded Contractor and Principal has entered into a contract with the Obligee dated _____ 20____, to perform all work and furnish all the labor, material and equipment for

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

as is more fully set forth in said contract.

Now, therefore, if the above bounded Contractor and Principal shall well and truly perform the work agreed to be performed under said contract, then obligation shall be null and void, otherwise to remain in full force and effect.

In witness whereof, we have hereunto set our hand this _____ day of _____, 20____.

_____

_____

_____

Contractor and Principal

_____

_____

_____

Surety

(NOTE: both the Contractor and the Surety must acknowledge the bond before a Notary Public.)

sj\:L:\landfill\63 016\Contract.doc\409-99\aw:1

FORM OF CONTRACT BOND
(RECOMMENDED)

PAYMENT

Know All Men by These Presents:

That Whereas

as Contractor and Principal, has entered into a contract for

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

with the County of Stanislaus, dated _____, 20____, to perform all work and furnish all labor, material, equipment, mechanical workmanship, transportation and services in accordance with the plans and specifications therefore required in the performance thereof, as is more fully set forth in said contract, which said contract is referred to and by reference made a part hereof; and,

Whereas, Division 3, Part 4, Title 15, Chapter 7, Section 3247, et seq., of the Civil Code requires that every person to whom is awarded a contract involving an expenditure in excess of twenty-five thousand dollars ($25,000.00) for any public work shall, before entering upon the performance of the work, file a Payment Bond with and approved by the officer of public entity by whom the contract was awarded.

W I T N E S S E T H

That the said Contractor and Principal, and

as Surety, are held and firmly bound unto the County of Stanislaus in the sum of ($) lawful money of the United States of America being not less than the total amount payable by the terms of said contract, for which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally by these presents.

The condition of the above obligation is such that if the said Contractor in said contract, or his or its subcontractors, shall fail to pay any of the persons named in Section 3181 of the Civil Code, or for any amounts required to be deducted, withheld and paid over to the Employment Development Department from wages of employees of the Contractor and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld and paid over pursuant to Section 18806 of the Revenue and Taxation Code, the said Surety will pay for the same, in an amount not exceeding the sum herein before specified, and, also, in case suit is brought upon this bond, a reasonable attorney's fee, to be fixed by the court, otherwise the bond shall be null and void.

This bond shall inure to the benefit of any of the persons named in Section 3181 of the Civil

Code, so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of said contract or the plans and specifications accompanying the same shall in any manner affect its obligations on this bond, and it hereby does waive any notice of any such changes, extension, alteration or addition.

In witness whereof, we have hereunto set our hand this _____ day of_____, 20____.

_____

_____

_____

_____

Contractor and Principal

_____

_____

_____

Surety

Approved this _____ day of _____, 20____

_____

_____

(NOTE: both the Contractor and the Surety must acknowledge the bond before a Notary Public.)

sj\:L:\landfill\63 016\Contract.doc\409-99\aw:1

AGREEMENT

This Agreement, made this _____, 20____, by and between _____, hereinafter called "Contractor", and the County of Stanislaus, State of California, hereinafter called "County".

W I T N E S S E T H

ARTICLE I

The Contractor will provide all the materials, tools, equipment and labor and perform all the work necessary to complete in a good workmanlike manner

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

as set forth in the Proposal of the Contractor and in accordance with the bid, Notice to Bidders, Information for Bidders, General Conditions, plans and specifications, bonds, addenda, and any documents particularly required or provided, all of which are attached hereto and made a part hereof. All of the foregoing documents, together with this Agreement, comprise the contract.

ARTICLE II

All of the work included in this contract is to be performed under the direction of the County, and in conformity with the true construction and meaning of the contract, as determined solely by the County.

ARTICLE III

No alterations in the work shall be made except upon written order of the County. The amount to be paid by the County or to be deducted from the contract price by virtue of such alterations shall be stated in said order and shall be approved in writing by the County and the Contractor.

Changes, additions, and alterations in the work, which do not exceed $500.00, may be ordered in writing by the Director of the Department of Public Works of the County of Stanislaus.

ARTICLE IV

The Contractor shall commence the work within five (5) calendar days after the date specified in the Notice to Proceed given to him, and shall prosecute said work in a prompt, diligent and workmanlike manner. The Contractor shall complete the work within

"ONE HUNDRED AND TWENTY (120) WORKING DAYS"

of the date of the Notice to Proceed, unless extension or suspension of the work is agreed to in writing by the County. Time is of the essence in this Agreement.

ARTICLE V

The County agrees to pay and the Contractor agrees to receive and accept the unit prices contained in his proposal as full compensation for furnishing all materials and for doing all the work contemplated and embraced in this agreement.

The County shall pay to the Contractor in due course and at the usual time for payment of County obligations after the last day of each month, ninety percent (90%) of the cost of the work completed and material properly stored on the job site, which cost shall be determined by the County. A final payment of ten percent (10%) of the contract price shall be due the Contractor 35 days after acceptance of the work, provided that the Contractor furnishes to the County satisfactory evidence that all obligations for labor and materials have been satisfactorily fulfilled within the said 35 day period, and further provided that no payment shall be construed to be an acceptance of defective work or improper materials.

Except as otherwise prohibited by law, the Contractor may elect to receive all payments due under the contract without any retention. If the Contractor so elects, he shall deposit with the County securities with a value equal to the monies, which would otherwise be withheld by the County. Said securities shall be as provided in Section 22300 of the Public Contract Code and shall be approved by the County as to both sufficiency and form.

ARTICLE VI

Prior to commencing the work, the Contractor shall file a bond issued by a surety company, approved by the County, and in the form acceptable to the County in the amount of one hundred percent (100%) of the contract price for the faithful payment and satisfaction of all lawful claims of all persons for labor and materials furnished in the prosecution of the contract work. Prior to commencing the work, the Contractor shall file a bond issued by a surety company, approved by the County, and in the form acceptable to the County in the amount of one hundred percent (100%) of the contract price to guarantee the faithful performance of the contract.

ARTICLE VII

The Contractor shall take out, and maintain during the life of the contract, insurance policies as described in Section 2.16 of the General Conditions of the contract documents.

ARTICLE VIII

The Contractor shall indemnify, defend, and save harmless Stanislaus County and all officers and employees thereof connected with the work from all claims, suits or actions of every name, kind and description, brought forth or on account of injuries to or death of any person, including, but not limited to, workmen and the public, or damage to property resulting from the

performance of the contract, except as otherwise provided by statute. The duty of the Contractor to indemnify and save harmless includes the duties to defend as set forth in Section 2778 of the Civil Code.

The Contractor waives any and all rights to any type of express or implied indemnity against the County, its officers or employees.

ARTICLE IX

When the work is completed and ready for final inspection, the Contractor shall notify the County, which shall make such final inspection within five (5) days after notice.

If the County shall approve the work and find that the work is complete and ready for acceptance and shall accept the same, the final payment of the contract price shall be due as provided in Article V, hereof.

ARTICLE X

The Contractor shall comply with all the provisions of state and local laws relating to contracts for the prosecution of public works, and Sections 2.13, 2.18, 2.19, 2.20, 2.21, and 2.22 of the General Conditions are hereby referred to and incorporated herein as if fully set forth. Pursuant to law, the County has ascertained the general prevailing rate of per diem wages in the locality of the work for each craft or type of workman required for performance of the contract, which rates are as stated in the Invitation to Bidders, and the Contractor shall be required to pay not less than said prevailing rates.

ARTICLE XI

Whenever any act is directed to be done or notice directed to be given by or to the County hereof, the same may be done or given by or to the Director of the Department of Public Works.

ARTICLE XII

The Contractor shall not assign the contract or sublet it as a whole without the written consent of the County, nor shall the Contractor assign any monies due or to become due to him hereunder without the previous written consent of the County. This contract shall be binding upon the parties hereto, their heirs, successors, assigns, subcontractors, and legal representatives.

ARTICLE XIII

Any alteration or alterations made in this contract, or any part hereof, shall not operate to release any surety from liability of any bond given pursuant to the provisions of this

contract and the consent of such surety to such alteration or alterations is hereby given, the surety expressly waiving hereby the provisions of Section 2819 of the Civil Code.

ARTICLE XIV

Neither the final certificate nor payment, nor any provision of the related documents, shall relieve the Contractor of responsibility for faulty workmanship or materials, and less otherwise specified, he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom which shall appear within a period of one (1) year from the date of filing Notice of Completion. The County shall give notice of observed defects with reasonable promptness. The Director of the Department of Public Works shall decide all questions arising under this Article.

In Witness Whereof, the parties have hereunto set their hands the day and year first above written.

CONTRACTOR

_____

By_____

_____
(Title)

Federal Employer ID No.

_____

COUNTY OF STANISLAUS

By_____
CHAIR, Board of Supervisors

ATTEST:

CHRISTINE FERRERO TALLMAN, Clerk
of the Board of Supervisors of the County
of Stanislaus, State of California

By _____
Deputy Clerk of the Board

APPROVE AS TO FORM
MICHAEL H. KRAUSNICK

BY _____
DEPUTY COUNTY COUNSEL

(NOTE: The Contractor must acknowledge the agreement before a Notary Public.)

sj\:L:\landfill\63 016\Contract.doc\409-99\aw:1

2.00 GENERAL CONDITIONS.

2.01 OWNER. The term "Owner", where used herein, shall mean the County of Stanislaus, a political subdivision of the State of California.

2.02 BOARD. The term "Board", where used herein, shall mean the Board of Supervisors of the County of Stanislaus, California.

2.03 ENGINEER. The Director of Public Works shall supervise and be responsible for the work, and whenever the word "Director" or the word "Engineer" is used herein, it shall mean the Director of Public Works of Stanislaus County, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

2.04 CONTRACTOR. The term "Contractor", where used herein, shall mean the Contractor to whom the contract for the work described and specified herein has been awarded to by the Board.

2.05 SUBCONTRACTOR. The term "Subcontractor", where used herein, includes only those having a direct contract with the Contractor for the work or portion of the work described and specified herein.

2.06 WORK. The term "Work", where used herein, includes all labor, materials and any necessary equipment required for complete performance of the contract.

2.07 CONTRACT DOCUMENTS. The term "Contract Documents", where used herein, includes the following: The Notice to Bidders, the Instructions to Bidders, the General Conditions, the plans and specifications, the bid, the Agreement, the general bond and insurance certificates. The contract documents are complementary, and what is called for by one shall be as binding as if called for by all.

2.08 DOCUMENT CLARITY. The Contractor's attention is directed to the following requirement:

Government Code 27361.7 - Requirement that document will reproduce readable photographic record substitution of legible original document or preparation of true copy of first document:

> Whenever the text of a document presented for record may be made out but is not sufficiently legible to reproduce a readable photographic record, the Recorder may require the person presenting it for record to substitute a legible copy of the first document by handwriting or typewriting and attach the same to the original as part of the document for making the permanent photographic record. The handwritten or typewritten legible copy shall be certified by the party creating the copy under penalty of perjury as being a true copy of the original. As used in this section, the word "text" includes the notary seal, certificates and other appendices, thereto.

2.09 COMPLETE CONTRACT. The complete contract consists of all of the contract documents.

2.10 PLANS AND SPECIFICATIONS. The term "Plans and Specifications", where used herein, shall mean and include all specifications and provisions of any kind, whether general, detailed or otherwise, relating to the labor, equipment, material or work in the installation thereof, and the plans and drawings, if any, accompanying same which are made a part hereof.

2.11 AGREEMENT. The Contractor to whom the work is awarded shall, within eight days after receipt of the contract documents as mailed by the Department of Public Works, enter into an agreement with the Owner. The form of agreement is attached herein and made a part of these General Conditions.

2.12 MATERIAL, LABOR, EQUIPMENT AND OTHER FACILITIES. Unless otherwise provided, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, lights, power, transportation and other facilities necessary for the execution and completion of the work.

2.13 PERMITS AND LICENSES. All permits and licenses necessary for the prosecution of the work shall be secured and paid for by the Contractor, except those secured by Stanislaus County and so noted.

2.14 INSPECTION OF WORK. A representative of the Owner shall, at all times, have access to the work and the Contractor shall provide proper facilities for such access and for inspection. The Contractor's attention is directed to Government Code Section 1126 and Stanislaus County Department of Public Works regulations wherein the County's representative is prohibited from accepting from the Contractor, his employees, and subcontractors any gratuity, gift, service or material of any value or use of equipment or facilities, and agrees to abide by the section and regulations.

2.15 BONDS. The Contractor shall furnish and deliver to the Board a surety bond in the amount equal to one hundred percent (100%) of the contract price to guarantee the faithful performance of the contract, and a surety bond in an amount equal to one hundred percent (100%) of the contract price for the faithful payment and satisfaction of all lawful claims of all persons for labor and material furnished and the prosecution of the contract. The contractor shall furnish a bid bond with his proposal equal in value to ten (10%) of his total bid. Such surety bonds shall be issued by a corporation duly and legally licensed to transact surety business in the State of California and approved by the Board. All participating signatures on the bonds shall be notarized.

2-16 INSURANCE.

A. Indemnity

The Contractor shall indemnify, defend, and save harmless the County of Stanislaus, its officers, agents, and employees, from any and all claims, demands, suits, and legal actions of any kind or nature including all costs, attorneys' fees, and expenses incurred therefrom; whether arising before or after final acceptance of this contract/ agreement; and whether in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part by reason of any act, omission, active or passive negligence of the Contractor or of anyone acting under the Contractor's direction and control. The Contractor's aforesaid indemnity and hold harmless agreement shall not be applicable to any said liability caused solely by the negligence of the County of Stanislaus.

B. Minimum Scope of Insurance:

Insurance coverage shall be at least as broad as:

1. General Liability:

$1,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to any act or omission to act by Contractor under this Agreement or the general aggregate limit shall be twice the required occurrence limit.

2. Automobile Liability Insurance:

Owned/Non-owned automobile liability insurance providing combined single limits covering bodily injury liability with limits of no less than One Million Dollars ($1,000,000) per accident, and providing property damage liability of no less than One Hundred Thousand Dollars ($100,000) per accident.

3. Workers' Compensation Insurance:

Workers' Compensation insurance as required by the Labor Code of the State of California.

C. Labor Code Certification:

In signing this contract, the Contractor makes the following certification, required by Section 1861 of the California Labor Code. I am aware of the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for workmen's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

D. Deductibles, Self-Insured Retentions, Named Insureds:

Any deductibles, self-insured retentions or named insureds must be declared in writing and approved by County. At the option of the County, either: the insurer shall reduce or eliminate such deductibles, self-insured retentions or named insureds; or the Consultant shall provide a bond, cash or letter of credit guaranteeing payment of the self-insured retention, deductible, or payment of any and all costs, losses, related investigations, claim administration and defense expenses.

E. Other Insurance Provisions:

The insurance policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages

a. The Contractor shall provide a specific endorsement naming the County and County's officers, officials, employees, and volunteers as insureds regarding: liability arising from or in connection with the performance or omission to perform any term or condition of this Agreement by or on behalf of the Contractor, including the insured's general supervision of the Contractor; services, products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; and automobiles owned, leased, hired or borrowed by the Contractor.

b. The Contractor's insurance coverage shall be primary insurance regarding the County and County's officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the County or County's officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with Contractor's insurance.

c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to County or County's officers, officials, employees, or volunteers.

d. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

2. Workers' Compensation and Employers Liability Coverage:

The insurer shall agree to waive all rights of subrogation against the County and County's officers, officials, employees, and volunteers for losses arising from the performance of or the omission to perform any term or condition of this Agreement by the Contractor.

3. All Coverages:

Each insurance policy required by this section shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to County.

F. **Acceptability of Insurers:**

Insurance is to be placed with California admitted insurers (licensed to do business in California) with a Best's rating of no less than A-:VII.

G. **Verification of Coverage:**

At the time required for the submittal of executed bonds and signed agreement, Contractor shall furnish County with certificates of insurance and with original endorsements effecting coverage required by this section. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements shall be received and, in County's sole and absolute discretion, approved by County. County reserves the right to require complete copies of all required insurance policies and endorsements, at any time.

H. **Subcontractors:**

Contractor shall require that all of its subcontractors are subject to the insurance and indemnity requirements stated herein, or shall include all subcontractors as additional named insureds under its insurance policies.

I. Insurance Limits Do Not Limit Contractor Liability:

The limits of insurance described herein shall not limit the liability of the Contractor and Contractor's agents, representatives, employees or subcontractors.

2.17 ASSIGNMENT OF CONTRACT. The Contractor shall not assign the contract or sublet it as a whole without written consent of the Owner, nor shall the Contractor assign any monies due or to become due to him hereunder without the written consent of the Owner.

2.18 EIGHT-HOUR DAY. The time of service of any laborer, workman, or mechanic employed upon any of the work herein specified is limited and restricted to eight (8) hours during any one calendar day, and 40 hours during any one calendar week, except that work performed by employees of contractors in excess of eight (8) hours per day, and 40 hours during any one week, shall be permitted upon public work upon compensation for all hours worked in excess of eight (8) hours per day and not less than one and one-half (1-1/2) times the basic rate of pay.

The Contractor shall forfeit, as a penalty to the owner $25.00 for each laborer, workman or mechanic employed in the execution of this contract by him or by any subcontractor under him, upon any public work herein specified for each calendar day or week during which any laborer, workman or mechanic is required or permitted to labor more than eight (8) hours in any one calendar day or 40 hours in any one calendar week in violation of the provisions of Article 3 of Chapter 1, Part 7, Division 2 of the Labor Code of the State of California, and said sums and amount which shall have been so forfeited pursuant to this paragraph and said provisions of said Labor Code shall be withheld and retained from payment due to the Contractor under this contract, pursuant to this contract and the said terms of said Code; but no

sums shall be so withheld, retained, or forfeited except from the final payment without a full investigation by either the Division of Labor Law Enforcement of the State Department of Industrial Relations or by said Board.

2.19 PREVAILING WAGES. The Contractor shall comply with Labor Code Section 1775. In accordance with said Section 1775, the Contractor shall forfeit, as a penalty to the County of Stanislaus, $25.00 for each calendar day or portion thereof for each workman paid less than the stipulated prevailing rates for such work or craft in which such workman is employed for any work done under the contract by him or by any subcontractor under him. In addition to said penalty, the difference between such stipulated prevailing wage rates and the amount paid to each workman for each calendar day or portion thereof for which each workman was paid less than the stipulated prevailing wage rate shall be paid to each workman by the Contractor.

Pursuant to Sections 1770 and 1773 of the Labor Code, the Board of Supervisors has ascertained the general prevailing rate of per diem wages applicable to the work to be done for straight time, overtime, Saturday, Sunday and holiday work. These wage rates, which are set forth by the Director of the Department of Industrial Relations, are now on file with the Department of Public Works and are a part of the contract. The Contractor is required to post a copy of these prevailing wage rates on the job site.

The County will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth as provided herein. The possibility of wage increases is one of the elements to be considered by the Contractor in determining his bid, and will not under any circumstances be considered as the basis of a claim against the County on the contract.

2.20 PAYROLLS AND BASIC RECORDS. The Contractor shall meet the requirements of Section 7-1.01A(3), "Payroll Records", of the State of California Standard Specifications. The Contractor shall be responsible for compliance by his subcontractors.

2.21 REQUIRED LISTING OF PROPOSED SUBCONTRACTORS. Each proposal shall have listed therein the name and address of each subcontractor to whom the bidder proposes to subcontract portions of the work in the amount of 1/2 of one percent of his total bid or $10,000, whichever is greater, in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Public Contract Code. The bidder's attention is invited to other provisions of said Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractor or by making unauthorized substitutions.

A sheet for listing the subcontractors, as required herein, is included in the Proposal.

2.22 STANDARD SPECIFICATIONS AND CODES. All work herein specified shall be performed in accordance with applicable sections of the following Standard Specifications or Codes, which are herein, named and hereby made a portion of these specifications. In a case of conflict between these specifications and said Standards, these specifications shall be paramount.

Stanislaus County Ordinance Code Title 16 (Uniform Plumbing Code, 1991 Edition)

Stanislaus County Ordinance Code Title 16 (National Electric Code, 1990 Edition)

Stanislaus County Ordinance Code Title 16 (Uniform Mechanical Code, 1992 Edition)

Standard Specifications of the California Business and Transportation Agency, Department of Transportation, July, 1992

Stanislaus County Improvement Standards

Title 24 Cal State Building Code

2.23 TAXES. Any federal, state or city tax payable on articles furnished by the Contractor under the contract shall be included in the contract price paid by the Contractor.

2.24 TIME FOR COMPLETION AND LIQUIDATED DAMAGES. The work to be performed under this contract shall be completed within

"ONE HUNDRED AND TWENTY (120) WORKING DAYS"

from the date of Notice to Proceed. Should the Contractor fail to complete this contract and the work provided for therein within the fixed time for such completion, the parties hereto agree that it would be impracticable or extremely difficult to fix the actual damage, and therefore agree that the Contractor shall be liable to the Owner and may be assessed by the Owner in the sum of **ONE THOUSAND DOLLARS ($1,000.00) per day** for each calendar day this contract is delayed beyond the time of completion above agreed upon by failure of the Contractor to complete the contract as specified. Such payment shall be construed to be liquidated damages by the Contractor in lieu of any other claim for damage because of such delay, and shall not be construed as a penalty.

2.25 PREFERENCES. Price and quality being equal, preference shall be given by the Contractor to Stanislaus County products.

2.26 DEFECTS IN WORK. The Contractor shall be responsible for and must make good any defects through faulty, improper or inferior workmanship or materials arising or discovered in any part of this work within one (1) year after the completion and acceptance of the same.

2.27 DEVIATION FROM PLANS AND SPECIFICATIONS. No deviation shall be made from the plans and specifications. If the Contractor shall vary from the plans and specifications in the form of quality or in the work or the amount or value of the materials herein provided for, the Owner shall have the right to order such improper work or materials removed, remade or replaced. In the event that the work is ordered changed, any other work disturbed or damaged by such alteration shall be made good at the Contractor's expense.

2.28 BRANDS. Wherever the name or brand of a manufacturer or an article is specified herein, it is used as a measure of quality and utility or a standard. If the Contractor desires to use any other brand or manufacturer of equal quality and utility to that specified, he shall make application to the Owner in writing and submit samples, if requested. The Contractor shall have 35 days after the award of the contract for submission of data substantiating any such request for substitution of "equal" items. The Owners will then determine whether or not the name brand or article is equal in quality and utility to that specified, and its decision shall be final.

Except in those instances in which the product is designated to match others presently in use, specifications herein calling for a designated material, product, thing or service by specific brand or trade name shall be deemed to be followed by the words "or equal" so that bidders may furnish any equal material, product, thing or service. The successful bidder shall have thirty-five (35) days after award of the contract for submission of data substantiating a request for a substitution of "an equal" item, pursuant to Section 3400 of the Public Contract Code.

2.29 NEW MATERIALS. All materials used in the work shall be new and the best market quality, unless specified or shown otherwise. All labor used on this contract shall be competent and skilled for the work. All work executed under this contract shall be done in the best, most thorough substantial and workmanlike manner. All material and labor shall be subject to the approval of the Engineer as to quality and fitness, and shall be immediately removed if it does not meet with his approval.

2.30 ABANDONMENT OF WORK. Should the Contractor abandon the work called for under the plans and specifications and contract documents, or assign his contract, or if the Contractor unnecessarily and unreasonably delays the work, or if the Contractor willfully violates any of the conditions of the plans and specifications or contract documents, or performs the work in bad faith, the Owner shall have the power to notify the Contractor to discontinue all work or any part thereof under this contract, and thereupon the Contractor shall cease to continue said work or such part thereof as the Owner may designate, and the Owner shall thereupon have the power to employ such persons as it may consider desirable, and to obtain by contract, purchase, hire or otherwise, such implements, tools, material or materials as the Owner may deem advisable to work at and be used to complete the work herein described, or such part thereof as shall have not been completed, and to use such material as it may find upon the site of said work, and to charge the expense of such labor and material, implements and tools to the Contractor, and the expense so charged shall be deducted and paid by the Owner out of such monies as may be either due, or may at any time thereafter become due to the Contractor hereunder and by virtue of the contract.

In the case such expense is less than the sum which would have been payable under the contract, if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference, and in case such expense shall exceed the last said amount, then the Contractor or his bondsman shall pay the amount of such excess to the Owner on notice to either from the Owner the excess so due.

2.31 OCCUPANCY OF BUILDING. The Owner reserves the right to occupy or use any part or parts or the entirety of the building or project upon which the work is to be performed during the performance of the work. The exercising of this right shall in no way constitute an acceptance of such part or parts of the work, nor shall it in any way effect the date and time when the work is to be completed, nor shall it in any way prejudice the Owner's rights in the Contractor any bond guaranteeing the same; this contract is to be deemed completed only when all of the work contracted for shall be duly and properly performed and accepted by the Board.

2.32 EXTENSION OF TIME. If it appears to the Contractor that he will not complete the work herein specified in the time agreed, he shall make written application to the Owner at least five (5) calendar days prior to the expiration of the time for completion, stating the reasons why and the amount of extension which he believes he should be granted. The Owner may then, in its discretion, grant or deny such extension.

2.33 SUSPENSION OF WORK. Should the Owner, for any cause, authorize a suspension of work, the time of such suspension will be added to the time allowed for completion. Suspension of work by order of the Board shall not be deemed a waiver of the claim of the Owner for damages for non-completion of the work as above required.

2.34 JUSTIFIABLE DELAYS. The Contractor shall not be held responsible for delays in the completion of the work caused by strikes, labor disturbances, lack or failure of transportation, war, inability to obtain materials due to war conditions, perils of the sea, insurrection, riot, acts of any government, whether foreign or domestic, federal or state, and/or any other causes similar to the foregoing which are beyond the control of and are not the fault of the Contractor, or if prevented by conditions directly resulting from the execution of contracts or the placing of orders by the Federal government or its authorized agencies or representatives, which are required by law to be given priority, but provided that whenever the Contractor shall claim that delays are due to any or all of the above named cause or causes of delay, request an extension of time in accordance with paragraph 2.31 of these General Conditions, and if the Board finds that such cause or causes of delay exist, it shall grant him an extension of time equal to the delay resulting from such cause or causes, or the Board may at its option, rescind said contract and pay said Contractor for the reasonable value of the work completed and let a new contract for the completion of the remainder of the work herein specified.

2.35 PATENTS AND ROYALTIES. If any material, composition, process or any other thing called for or required by the plans and specifications heretofore adopted by the Owner is covered by letter

patent, all royalties and expenses thereof, all litigation therefrom, or other things whatsoever, which may develop as a cost from the use of such material, composition, process or any other thing which is covered by letter patents shall be borne by the Contractor. The Contractor shall pay all license and/or royalty fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.

2.36 EXAMINATION OF SITE. The Contractor shall be held to have examined the site, compared it with the drawings and specifications, and to have satisfied himself as to the conditions under which the work is to be performed. No allowance or claims on his behalf will be made for any expense to which he may be put as a result or failure on his part to thoroughly acquaint himself with conditions at the site.

2.37 DAMAGE TO OTHERS. The Contractor shall exercise due caution during his operations so as not to damage the property of others or Owner's property not directly involved under the plans and specifications, and shall be responsible for the protection of this property and shall replace any and all such property to its former condition as a result of his failure to provide protection or exercise due caution during his operations.

2.38 SURVEYS AND GRADES. The Engineer shall establish permanent type reference monuments or posts for the alignment and elevations of all work. For structures, he will provide said monuments for reference data only. For general engineering contracts he shall provide the usual stakes sufficient for construction. The Contractor shall be charged with the responsibility of adequately protecting said stakes and monuments. The Contractor shall be requested to set supplemental posts for detailed construction needs.

2.39 SHOP DRAWINGS. The Contractor shall furnish two (2) copies of shop drawings for all steel, miscellaneous iron, electrical and sheet metal work at such time as to cause no delay in his own or other person's work. The Engineer shall, with reasonable promptness, check the drawings, making corrections, and return them for fabrication; two (2) copies of the corrected drawings used for fabrication shall be returned to the Engineer. The drawings shall not relieve the Contractor from any errors made in fabrication or deviation from original plans and specifications unless such deviation has been specifically permitted in writing by the Director of the Department of Public Works.

2.40 CORRECTION OF WORK AFTER FINAL PAYMENT. Neither the final certificate nor final payment, nor any provision of the contract documents shall relieve the Contractor of responsibility for faulty materials or workmanship, and unless otherwise specified, he shall remedy any defects due thereto and shall pay for any damage or other work resulting therefrom which shall appear within a period of one year from the date of substantial completion. The Owner shall give notice of observed defects with reasonable promptness. All questions arising under this article shall be decided by the Director of Public Works.

2.41 CHANGES IN WORK. The Owner, without invalidating the contract, may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly. All such work shall be performed under the conditions of the contract except that any claim for extension of time caused thereby shall be adjusted at the time of ordering the change. The Engineer shall have authority to make minor changes not involving extra cost and not inconsistent with the purpose of the project.

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

A. By estimate and acceptance in a lump sum;

B. By unit prices named in the contract or subsequently agreed upon;

C. By cost and percentage and fixed fee.

Should conditions below surface of the ground be at variance with the conditions indicated by the drawings and specifications, the contract sum shall be equitably adjusted upon claim by either party made within a reasonable time after first observation of conditions.

The amount agreed upon as the value of any extra work resulting from any change order shall constitute full and complete compensation for all overhead, labor, material, tools, and equipment furnished in the performance of work required by that change order. Furthermore, the amount agreed upon as the value of extra work for any change order shall be accepted by the Contractor as full and complete compensation for any and all claims of any nature whatsoever, including, but not limited to, any actual or alleged claims for compensation by Contractor, or any subcontractor of Contractor for delays occasioned by or in any way arising out of stoppage of the work, coordination of the work with others, or processing of that change order.

2.42 CLEANING UP. Contractor shall at all times keep the premises free from accumulations of waste material or rubbish as a result of this operation. Upon completion of work he shall remove all rubbish, material and his equipment from the job and shall leave the job site in a "broom clean" or equivalent condition. In case of a dispute regarding this item, the Owner may remove rubbish or material and charge the cost to the several contractors, as the authorized representative shall deem just.

2.43 SUPERVISION. The Contractor shall, at all times during the working hours of the contract, have a competent foreman or superintendent on the job who shall be authorized to act as an agent of the Contractor. Such agent shall be familiar with the type of work hereunder and be aware of the hazards and the safety rules relating to this particular type of construction. Ignorance or incompetence of a foreman shall be due cause for his removal from the job and cessation of work under this contract until the intent of this paragraph is fulfilled, without recourse by the Contractor for any extension of the time of completion as a result of the removal of such unsatisfactory agent.

2.44 APPRENTICESHIP STANDARDS. This contract is subject to the provisions in Sections 1777.5 (Chapter 1411, Statutes of 1968) and 1777.6 of the Labor Code concerning the employment of apprentices by the Contractor or any subcontractor under him. Section 1777.5, as amended, requires the Contractor or subcontractor employing tradesmen in any apprenticeable occupation to apply to the Joint Apprenticeship Committee nearest the site of the public works project and which administers the apprenticeship program in that trade for a certificate of approval. The certificate will also fix the ratio of apprentices to journeymen that will be used in the performance of the contract. The ratio of apprentices to journeymen in such cases shall not be less than one to five, except:

A. When unemployment in the area of coverage by the Joint Apprenticeship Committee has exceeded an average of fifteen percent (15%) in the 90 days prior to the request for certificate; or

B. When the number of apprentices in training in the area exceeds a ratio of one to five; or

C. When the trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis statewide or locally; or

D. When the Contractor provides evidence that he employs registered apprentices on all of his contracts on an annual average of not less than one apprentice to eight journeymen.

The Contractor is required to make contributions to funds established for the administration of apprenticeship programs if he employees registered apprentices or journeymen in any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

The Contractor and any subcontractor under him shall comply with the requirements of Sections 1777.5 and 1777.6 in the employment of apprentices.

Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

2.45 ASSIGNMENT OF ANTI-TRUST ACTIONS AND UNFAIR BUSINESS PRACTICE CLAIMS. In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S. C. Sec. 15) or under the Cartwright Act (Chapter 2, commencing with Section 16700) or Part 2 of Division 7 of the Business and Professions Code, arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

2.46 EQUAL EMPLOYMENT OPPORTUNITY. Contractor agrees for the duration of this contract that it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap. The Contractor

will take affirmative action to insure that employees are treated during employment or training without regard to their race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

The Contractor will in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap.

The Contractor will send to each labor union or other representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the workers' representative of the Contractor commitments under this agreement.

The Contractor agrees that it will comply with the provisions of Titles VI and VII of the Civil Rights Act, Revenue Sharing Act Title 31, U.S. Code Section 2716, and California Government Code Section 12990.

The Contractor agrees that it will assist and cooperate with the County, the State of California and the United States Government in obtaining compliance with the equal opportunity clause, rules, regulations, and relevant orders of the State of California and United States Government issued pursuant to the Acts.

In the event of the Contractor's non-compliance with the discrimination clause, the affirmative action plan of this contract, or with any of the said rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part by the County.

2.47 HANDICAPPED NON-DISCRIMINATION. This project is subject to Section 504 of the Rehabilitation Act of 1973 as amended, (29 U.S.C. 794), and all requirements imposed by the applicable office of Revenue Sharing Regulations (31CFR Part 51) and all guidelines and interpretations issued thereto. In this regard, the County and all of its contractors and subcontractors will take all reasonable steps to ensure that handicapped individuals have the maximum opportunity for the same level of aid, benefit or service as any other individual.

2.48 FAIR EMPLOYMENT AND HOUSING ACT ADDENDUM. In the performance of this contract, the Contractor will not discriminate against any employee or applicant for employment because of race, sex, color, religion, ancestry, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, sex, color, religion, ancestry, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, promotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the State or local agency setting forth the provisions of this Fair Employment and Housing Section.

The Contractor will permit access to his records of employment, employment advertisements, application forms, and other pertinent data and records by the State Fair Employment and Housing Commission, or any other agency of the State of California designated by the awarding authority, for the purposes of investigation to ascertain compliance with the Fair Employment and Housing section of this contract.

Remedies for willful violation:

A. The State or local agency may determine a willful violation of the Fair Employment and Housing provision to have occurred upon receipt of a final judgement having that effect from a court in an action to which Contractor was a party; or upon receipt of a written notice from the Fair Employment and Housing Commission that it has investigated and determined that the Contractor has violated the Fair Employment and Housing Act and has issued an order or obtained an injunction under Government Code Section 12900, et seq.

B. For willful violation of this Fair Employment and Housing provision the State or local agency shall have the right to terminate this contract either in whole or in part, and any loss or damage sustained by the State or local agency in securing the goods or services hereunder shall be borne and paid for by the Contractor and by his surety under the performance bond, if any, and the State or local agency may deduct from any monies due or that thereafter may become due to the Contractor, the difference between the price named in the contract and the actual cost thereof to the State or local agency.

2.49 CONTRACTS WHICH INVOLVE DIGGING TRENCHES OR EXCAVATIONS.

Note the required language in Public Contract Code Section 7104 concerning contracts, which involve digging trenches or excavations;

Any Public Works contract of a local public entity, which involves digging trenches or other excavations that extend deeper than four feet below the surface, shall contain a clause, which provides the following:

A. That the Contractor shall promptly, and before the following conditions are disturbed, notify the public entity, in writing, of any:

1. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, 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.

3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

B. That the public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the contract.

C. That, in the event that a dispute arises between the public entity and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. The Contractor shall retain any and all rights provided either by contract or by law, which pertain to the resolution of disputes and protests between the contracting parties.

2.50 ARBITRATION The last paragraph in Section 9-1.10, "Arbitration," of the Standard Specifications is amended to read.

Arbitration shall be initiated by a Complaint in Arbitration made in compliance with the requirements of said regulations. A Complaint in Arbitration by the Contractor shall be made not later than 180 days after the date of service in person or by mail on the Contractor of the final written decision by the Department on the claim.

2.51 NOTICE OF POTENTIAL CLAIM Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications is amended to read:

9-1.04 Notice of Potential Claim The Contractor shall not be entitled to the payment of any additional compensation for any act, or failure to act, by the Engineer, including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence, or other cause, unless he shall have given the Engineer due written notice of potential claim as hereinafter specified. Compliance with this Section 9-1.04 shall not be a prerequisite as to matters within the scope of the protest provisions in Section 4-1.03, "Changes," or Section 8-1.06, "Time of Completion," or the notice provisions in Section 5-1.116, "Differing Site Conditions," or Section 8-1.07, "Liquidated Damages," or Section 8-1.10, "Utility and Non-Highway Facilities," nor to any claim which is based on differences in measurements or errors of computation as to contract quantities.

The written notice of potential claim shall be submitted to the Engineer prior to the time that the Contractor performs the work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within 15 days after the happening of the event, thing, occurrence, or other cause, giving rise to the potential claim.

The written notice of potential claim shall be submitted on Form CEM-6201 furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650 - 12655. The notice shall set forth the reasons for which the Contractor believes additional compensation will or may be due and the nature of the costs involved. Unless the amount of

the potential claim has been stated in the written notice, the Contractor shall, within 15 days of submitting said notice, furnish an estimate of the cost of the affected work and impacts, if any, on project completion. Said estimate of costs may be changed or updated by the Contractor when conditions have changed. When the affected work is completed, the Contractor shall submit substantiation of his actual costs. Failure to do so shall be sufficient cause for denial of any claim subsequently filed on the basis of said notice of potential claim.

It is the intention of this Section 9-1.04 that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

Should the Contractor, in connection with or subsequent to the assertion of a potential claim, request inspection and copying of documents or records in the possession of the Department that pertain to the potential claim, Contractor shall make its records of the project, as deemed by the Department to be pertinent to the potential claim, available to the Department for inspection and copying.

2.52 FINAL PAYMENT AND CLAIMS Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications is amended to read:

9-1.07B Final Payment and Claims. --After acceptance by the Director, the Engineer will make a proposed final estimate in writing of the total amount payable to the Contractor, including therein an itemization of said amount, segregated as to contract item quantities, extra work and any other basis for payment, and shall also show therein all deductions made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the proposed final estimate. The Contractor shall submit written approval of the proposed final estimate or a written statement of all claims arising under or by virtue of the contract so that the Engineer receives such written approval or statement of claims no later than close of business of the thirtieth day after receiving the proposed final estimate. If the thirtieth day falls on a Saturday, Sunday or legal holiday, then receipt of such written approval or statement of claims by the Engineer shall not be later than close of business of the next business day. No claim will be considered that was not included in the written statement of claims, nor will any claim be allowed as to which a notice or protest is required under the provisions in Sections 4-1.03, "Changes," 8-1.06, "Time of Completion," 8-1.07, "Liquidated Damages," 5-1.116, "Differing Site Conditions," 8-1.10, "Utility and Non-Highway Facilities," and 9-1.04, "Notice of Potential Claim," unless the Contractor has complied with the notice or protest requirements in said sections.

On the Contractors approval, or if he files no claim within said period of 30 days, the Engineer will issue a final estimate in writing in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the State will pay the entire sum so found to be due. Such final estimate and payment thereon shall be conclusive and binding against both parties to the contract on all

questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

If the Contractor within said period of 30 days files claims, the Engineer will issue a semifinal estimate in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the State will pay the sum so found to be due. Such semifinal estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except insofar as affected by the claims filed within the time and in the manner required hereunder and except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

Claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. If additional information or details are required by the Engineer to determine the basis and amount of said claims, the Contractor shall furnish such further information or details so that the Engineer receives the information or details no later than the fifteenth day after receipt of the written request from the Engineer. If the fifteenth day falls on a Saturday, Sunday or legal holiday, then receipt of such information or details by the Engineer shall not be later than close of business of the next business day. Failure to submit such information and details to the Engineer within the time specified will be sufficient cause for denying the claim.

The 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 required by the Engineer to determine the facts or contentions involved in the claims. Failure to permit access to such records shall be sufficient cause for denying the claims.

Claims submitted by the 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 Section 12650 et. seq., the undersigned,

_____,
(name)
_____ of
(title)
_____
(company)

hereby certifies that the claim for the additional compensation and time, if any, made herein for the work on this contract is a true statement of the actual costs incurred and time sought, and is fully documented and supported under the contract between parties.

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 type expenses or costs, 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 State at its discretion.

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

The District Director of the District, which administers the contract, will make the final determination of any claims, which remain in dispute after completion of claim review by the Engineer. A board or person designated by said District Director will review such claims and make a written recommendation thereon to the District Director. The Contractor may meet with the review board or person to make a presentation in support of such claims.

Upon final determination of the claims, the Engineer will then make and issue his final estimate in writing and within 30 days thereafter the State will pay the entire sum, if any, found due thereon. Such final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

2.53 SUPPLEMENTAL WORK A Supplemental Work item may be included in the contract to cover modifications to the work necessitated by field conditions. The amount of expenditure under this item may vary from zero to the total amount of the item. This amount may constitute the sum of several modifications. The engineer will notify the Contractor in writing when portion of the work being performed will be paid for under this item.

SECTION 3. (BLANK)

SECTION 4. (BLANK)

SECTION 5. (BLANK)

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

SECTION 8-2
TESTING

8-2.00 COMPACTION. Relative compaction shall be determined by Calif. Test 231 utilizing the nuclear gauge. Calif. Test 231 shall be modified to use 30-second counts or one-minute counts at the option of the Engineer. Five 30-second warm-up counts shall be used instead of ten one-minute warm up counts for testing with 30-second counts.

Section "B" of Calif. Test 231 shall be amended as follows:

At the discretion of the Engineer, a guide plate measuring approximately 9-3/4" x 14" x 3/16" may be substituted for the standard plate. Additionally, a sliding sleeve impact hammer which incorporates a 13/16" diameter pin, and is manufactured specifically for use with a nuclear gauge and guide plate, may be used in lieu of Standard driving pin.

Part 2 of Calif. Test 216 shall be modified as follows:

1. An automatic compactor may be used in lieu of standard hand compaction methods. The compactive effort in either case shall be the same.

2. A split cylindrical mold that is 1' 3" in height may be substituted for the standard mold.

CONSTRUCTION DRAWINGS

	COVER SHEET
1	LF - 2 SITE PLAN
2	LF - 1 SITE PLAN
3	BLOWER/FLARE FACILITY PLAN
4	BLOWER/FLARE SKID (PLAN & ELEVATION)
5	FLARE DETAILS
6	WELL DETAILS
7	CONDENSATE COLLECTION DETAILS
8	FOUNDATIONS & DETAILS
9	LF – 2 DETAILS
10	BLOWER/FLARE SKID P&ID
11	ELECTRICAL
12	ELECTRICAL DETAILS

CONTENTS

TECHNICAL SPECIFICATIONS

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Related sections
B. Project location and access
C. Scope of work
D. Construction sequence
E. Existing site conditions
F. Construction drawings
G. Quality assurance
H. Manufacturer's specifications and instructions
I. Testing laboratory
J. Surveying

1.02 RELATED SECTIONS

A. Section 01019 - Mobilization and Demobilization
B. Section 01090 - References
C. Section 01190 - Health and Safety
D. Section 01630 - Product Options and Substitutions
E. Section 01720 - Project Record Documents
F. Section 01730 - Installation, Operation, and Maintenance Instructions
G. Section 02221 - Excavating, Backfilling, Compacting, and Grading
H. Section 02687 - Landfill Gas Wells and Wellheads
I. Section 02830 - Chain Link Fences
J. Section 03300 - Cast-In-Place Concrete
K. Section 09910 - Painting
L. Section 11000 - Equipment
M. Section 15480 - Piping
N. Section 16050 - Basic Electrical Requirements
O. Section 16100 - Basic Electrical Materials and Methods
P. Section 16500 - Lighting
Q. Section 16910 - Control Panels

1.03 PROJECT LOCATION AND SITE ACCESS

A. The project site is the Fink Road Landfill, which is located at the intersection of Fink Road (a.k.a. Crows Landing Road) and Interstate Highway 5, west of Crows Landing, Stanislaus County, California.

B. Access to the work area is via the Landfill's main entrance road.

1.04 SCOPE OF WORK

A. General: The Work included in the contract consists primarily of construction of a landfill gas collection and control system, including a blower/flare facility. The Work is more fully detailed in the Specifications and Contract Drawings included herein.

B. Principal Features:

1. Mobilization and demobilization of equipment, labor, and construction of temporary facilities.
2. Site preparation for the construction of the blower/flare facility.
3. Construction of vertical landfill gas extraction wells.
4. Installation of landfill gas collection and control system piping.
5. Installation of a blower/flare facility.
6. Installation of a condensate collection and disposal system.

C. The above description of the Work is for general information only, and does not limit the responsibility of the CONTRACTOR to accomplish the Work in strict accordance with the Contract Drawings and Specifications.

D. The Work shall be performed in strict accordance with the applicable requirements of the state and local agencies having jurisdiction, and in accordance with the requirements of the Special Provisions, Technical Specifications, and the Contract Drawings. The CONTRACTOR will provide a site specific Health and Safety Plan (HASP) for OWNER\ENGINEER approval. It will be the CONTRACTOR's responsibility to be fully appraised of site conditions and to follow the approved HASP.

1.05 CONSTRUCTION SEQUENCE

A. Meetings will be conducted between the OWNER/ENGINEER and CONTRACTOR prior to starting each sequence of construction. The intent of these meetings is to review and discuss specification requirements for that particular sequence of construction. During these meetings, the CONTRACTOR shall present a construction plan for each construction sequence, as applicable, outlining and detailing the equipment, personnel, schedule and materials required, including source, transportation, excavation, placement, and compaction of proposed materials.

B. Periodically, as determined by the OWNER/ENGINEER, the CONTRACTOR will be required to attend and participate in construction coordination meetings. The purpose of these meetings is to bring the Specification requirements to the attention of the CONTRACTOR, including quality control, as well as safety consideration of a particular phase of the Work prior to initiation of the activities. The CONTRACTOR will be notified of the item(s) to be discussed and shall attend the meetings and be prepared to outline the approach to the Work, the time frame involved, both calendar time and shifts, the type and number of personnel and equipment to be used, and any special material required. The OWNER/ENGINEER will review the Specifications, quality control requirements, and safety concerns involved with the CONTRACTOR.

C. The CONTRACTOR shall cooperate fully and coordinate his activities with other construction CONTRACTORs and the OWNER/ENGINEER to ensure adequate notification and suitable access to other construction areas.

D. The CONTRACTOR shall begin construction within twenty (20) days of receiving the OWNER's "Notice To Proceed".

1.06 EXISTING SITE CONDITIONS

A. The CONTRACTOR is advised that the construction of this project at the Fink Road Landfill will entail working in, on, and adjacent to buried solid wastes and refuse. As buried organic materials decompose anaerobically, they generate landfill gas (LFG). This LFG (or biogas) normally consists of about 45 percent carbon dioxide (CO_2), 55 percent methane (CH_4) and other gases, depending on the composition of the buried materials. Occasionally hydrogen sulfide (H_2S) or other toxic gases have been encountered at some landfills even though the site was not classified as a hazardous waste disposal site.

B. The CONTRACTOR shall provide all other services necessary to the completion of the work, including but not limited to construction water, potable water, utilities, and site security.

C. Onsite water is available from an onsite well/tank for fire and dust control.

1.07 CONSTRUCTION DRAWINGS

A. A list of Construction Drawings and Titles is given in the Table of Contents of these Contract Documents under "Contract Drawings".

B. Where "as shown," "as detailed," "as noted," or words of like meaning are used in the Contract Documents, it shall be understood that reference is being made to the Contract Drawings unless otherwise specified.

1.08 QUALITY ASSURANCE

A. When plans or specifications call for material or construction of a better quality or larger size or capacity than may be required by applicable codes or standards, the provisions of the Contract Drawings and/or Specifications shall take precedence over the requirements of the code or standard. If there is any other conflict between the Contract Drawings or Specifications and the requirements of applicable codes and standards, the more stringent provisions shall govern.

B. All equipment shall be designed, constructed, and installed in accordance with all applicable codes for seismic requirements for the project site region.

C. Shop and field work shall be performed by mechanics and workers skilled and experienced in the fabrication and installation of the work feature involved. All Work under this Contract shall be performed in accordance with the best practices of the various trades involved and in accordance with the Contract Drawings, reviewed shop drawings, and these Specifications.

D. All Work shall be erected and installed plumb, level, square and true, or true to indicated angle, and in proper alignment and relationship to the work of other trades. All finished Work shall be free from defects and damage.

E. The OWNER/ENGINEER reserves the right to reject any materials and work which are not considered to be up to the general standards of the various trades involved. Such inferior material or work quality shall be repaired or replaced, as directed, at no additional cost to the OWNER.

F. The CONTRACTOR shall secure all field measurements required for proper and accurate fabrication and installation of the Work included in this Contract. Exact measurements are the CONTRACTOR's responsibility. The CONTRACTOR shall also furnish or obtain all templates, patterns, and setting instructions required for the installation of all Work. All dimensions shall be verified by the CONTRACTOR in the field.

1.09 MANUFACTURERS' SPECIFICATIONS AND INSTRUCTIONS

A. Unless otherwise indicated or specified, all manufactured materials, products, processes, equipment, or the like shall be installed or applied in accordance with the manufacturers' drawings, instructions, directions, or specifications. Said installation or application shall be in accordance with printed instructions furnished by the manufacturer of the material or equipment concerned for use under conditions similar to those at the job site. Copies of such instructions and specifications shall be furnished to the OWNER/ENGINEER and his acceptance thereof obtained before work is begun.

1.10 TESTING LABORATORY

A. The CONTRACTOR will coordinate and conduct compaction testing using a certified laboratory approved by the OWNER/ENGINEER. Compaction testing will be performed on engineered fill. The CONTRACTOR will coordinate and perform concrete testing using a certified laboratory approved by the OWNER/ENGINEER, take concrete test cylinders and perform strength tests on concrete. The costs of concrete coring, retests or additional testing caused by the CONTRACTOR's operations will be the responsibility of the CONTRACTOR.

B. The CONTRACTOR will be responsible for notifying the OWNER/ENGINEER at least 24 hours in advance so that the OWNER/ENGINEER may be present during testing.

1.11 SURVEYING

A. The CONTRACTOR will provide the surveying services necessary to complete the work, including but not limited to, initial system layout, construction staking, measurement for payment, and record drawings.

B. All surveys for measurement for payment and record drawings shall be performed and sealed by a Professional Land Surveyor registered in the State of California.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for the work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable related item in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 01019
MOBILIZATION AND DEMOBILIZATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mobilization of all construction equipment, materials, supplies, appurtenances, and the like, manned and ready for commencing and performing the Work. Assembly and delivery to the site of plant, equipment, materials, and supplies necessary for the performance of the Work but which are not intended to be incorporated in the Work; preparation of the CONTRACTOR's work area; complete assembly, and in working order, of equipment necessary to perform the required work; personnel services preparatory to commencing actual work; and all other preparatory work required to permit commencement of actual work on construction items for which payment is provided under the Contract.

B. Subsequent removal from the site of all construction plants, equipment, materials (excluding surplus materials specified to remain on site), supplies, appurtenances, and the like; and cleaning and restoration of the site as directed by OWNER/ENGINEER upon completion of the Work.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Mobilization: Measurement for payment for mobilization will be by lump sum basis.

B. Demobilization: Separate measurement for payment will not be made for demobilization.

4.02 PAYMENT

A. Mobilization: Payment for work and materials specified for Mobilization shall be made for the lump sum price bid for "Mobilization and Demobilization" in the Bid Schedule, and shall include all items specified herein. Progress payment shall be made based on the percentage of Work Completed as specified in this Section at the time of invoicing.

B. Demobilization: Separate payment will not be made for work or materials associated with demobilization. All costs associated with demobilization will be considered subsidiary to the lump sum price bid for "Mobilization and Demobilization" in the Bid Schedule.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. This section supplements the requirements specified in the General Conditions and Supplementary Conditions. If the requirements of this section and conditions noted above conflict, the CONTRACTOR shall adhere to the more stringent requirement as determined by the OWNER.

B. Section Includes: General requirements for measurement and payment as they apply to this Contract.

C. Measurement methods specified in the individual Sections of these Specifications shall govern if they differ from methods specified in this Section.

D. The CONTRACTOR will compute all quantities. Where necessary, such computations will be based upon surveys performed by the CONTRACTOR.

1.02 RELATED SECTIONS

A. General Conditions

B. Supplementary Conditions

C. Section 01052 - Layout of Work and Surveys

D. Section 01300 - Submittals: Progress Payment Schedule

1.03 MEASUREMENT OF QUANTITIES

A. Measurement Standards: All work to be paid for at a Contract price per unit of measurement will be in accordance with United States Standard Measures.

B. Measurement by Weight:

1. Material to be measured and paid for by scale weight shall be weighed on accurate, approved scales. Platform scales of sufficient size and capacity shall be used to permit the entire vehicle or combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. All scales shall be inspected and certified as often as the OWNER/ENGINEER may deem necessary to ascertain accuracy.

2. The OWNER/ENGINEER may be present to witness the weighing and to check and compile the daily record of such scale weights; however, in any case, the OWNER/ENGINEER will require that the CONTRACTOR furnish weigh slips and daily summary weigh sheets. A duplicate weigh slip or a load slip for each vehicle weighed shall be delivered to the OWNER/ENGINEER at the point of delivery of the material.

3. Trucks used to haul material being paid for by weight, shall be weighed empty daily and at such additional times as the OWNER/ENGINEER may require. Each truck shall bear a plainly legible identification mark. The OWNER/ENGINEER may require the weight of the material verified by weighing empty and loaded trucks on such other scales as the OWNER/ENGINEER may designate.

C. Measurement by Volume:

1. Measurement by volume will be by the cubic dimension listed or indicated in the Bid Schedule. Method of volume measurement will be as determined or directed by the OWNER/ENGINEER.

2. When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the CONTRACTOR in writing and accepted by the OWNER/ENGINEER in writing, the material will be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the OWNER/ENGINEER and shall be agreed to by the CONTRACTOR before such method of measurement of pay quantities will be accepted.

D. Measurement by Area: Measurement by area will be by the square dimension listed or indicated in the Bid Schedule. Method of square measurement will be as determined or directed by the OWNER/ENGINEER.

E. Linear Measurement: Linear measurement will be by the linear dimension listed or indicated in the Bid Schedule. Method of linear measurement will be as determined or directed by the OWNER/ENGINEER. Generally, items, components, or work to be measured will be measured at the centerline of the item in place.

F. Lump-Sum Measurement:

1. Lump-sum measurement will be for the entire item, unit of work, structure, or combination thereof, as listed or indicated in the Bid Schedule.

1.04 FIELD MEASUREMENT FOR PAYMENT

A. The CONTRACTOR shall compute all quantities of Work performed or materials and equipment delivered and installed for payment purposes.

1.05 PAYMENT

A. Payment will be full compensation for furnishing all labor, materials, tools, equipment, transportation, services, and incidentals, as specified, and for performing all work necessary for completing the erection or installation of the item or work classification, including all adjusting and balancing, testing, cleaning, and all other incidental work.

B. Full compensation for all expense involved in conforming to the requirements for measuring materials or work shall be considered as included in the unit or lump-sum prices paid for the materials or work being measured, and no additional compensation will be permitted.

1.06 VALUES OF UNIT PRICES

A. The number of units and quantities contained in the Bid Schedule are approximate only, and final payment will be made for the actual number of units and quantities which are incorporated in or made necessary by the Work included in this Contract.

B. In the event that work and materials or equipment are required to be furnished to a greater or lesser extent than is indicated by the Contract Drawings and Specifications, such work and materials or equipment shall be furnished in greater or lesser quantities.

1.07 CHANGES AND EXTRA WORK

A. Changes and extra work ordered by the OWNER will be measured and paid for in accordance with the requirements of the General Conditions and Supplementary Conditions.

1.08 REJECTED MATERIALS

A. Quantities of material wasted or disposed of in a manner not called for under the Contract; rejected loads of material, including material rejected after it has been placed by reasons of the failure of the CONTRACTOR to conform to the provisions of the Contract; material not unloaded from the transporting vehicle; material placed outside the limits indicated on the Drawings or established by the OWNER/ENGINEER; or material remaining on hand after completion of the Work, will not be paid for, and such quantities shall not be included in the final total quantities. No compensation will be permitted for loading, hauling, and disposing of rejected material.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

(Not Used)

END OF SECTION

defects in the Work. The CONTRACTOR will be required to conduct resurveys or check surveys to correct errors indicated by review of the field notebooks or otherwise detected.

1.04 SURVEYS FOR LAYOUT AND PERFORMANCE OF WORK

A. The CONTRACTOR shall perform all surveys for layout and performance of the Work, reduce the field notes, make necessary calculations, and prepare drawings necessary to carry out such work.

1.05 SURVEYS FOR MEASUREMENT FOR PAYMENT

A. When the Specifications or the OWNER/ENGINEER require Bid Schedule items of work to be measured by surveying methods, the CONTRACTOR shall perform the surveys. All such surveys, including control surveys run for establishing the measurement reference lines, shall be performed in the presence of the OWNER/ENGINEER (or a representative of the OWNER/ENGINEER) who will witness the surveying operation by signing the field notes or keeping duplicate field notes, at the OWNER/ENGINEER's option. The CONTRACTOR will reduce the field notes and calculate final quantities for payment purposes. A duplicate of the note reductions and calculations will be given to the OWNER/ENGINEER.

1.6 SURVEYING ACCURACY AND TOLERANCES IN SETTING OF SURVEY STAKES

A. Control traverse field surveys and computations shall be performed to an accuracy of at least 1:25000.

B. The tolerances generally applicable in setting survey stakes shall be as set forth below. Such tolerances shall not supersede stricter tolerances required by the Drawings or Specifications, and shall not otherwise relieve the CONTRACTOR of responsibility for measurements in compliance therewith.

Type of Line or Mark	Horizontal Position	Elevation
Permanent reference points	1 in 10,000	$\pm$ 0.01 ft.
General excavation and earthwork	1 in 2,000	$\pm$ 0.10 ft.

C. Tolerances for designed thicknesses shown on Contract Drawings and for elevations shown on the Contract Drawings shall be + 0.10 foot.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Separate measurement for payment will not be made for work required under this Section.

4.2 PAYMENT

A. Separate payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included in the applicable related item of work in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 01090
REFERENCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Related Sections
B. References
C. Abbreviations

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01019 - Mobilization and Demobilization
C. Section 01190 - Health and Safety
D. Section 01630 - Product Options and Substitutions
E. Section 01720 - Project Record Documents
F. Section 01730 - Installation, Operation, and Maintenance Instructions
G. Section 02221 - Excavating, Backfilling, Compacting, and Grading
H. Section 02687 - Landfill Gas Wells and Well Heads
I. Section 02830 - Chain Link Fences
J. Section 03300 - Cast-In-Place Concrete
K. Section 09910 - Painting
L. Section 11000 - Equipment
M. Section 15480 - Piping
N. Section 16050 - Basic Electrical Requirements
O. Section 16100 - Basic Electrical Materials and Methods
P. Section 16500 - Lighting
Q. Section 16910 - Control Panels

1.03 REFERENCES

A. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, workmanship, installation inspections, and tests, which references are published and issued by the organizations, societies, and associations listed below by abbreviation and name. Such references are hereby made a part of the Contract Documents to the extent cited.

B. Any material, method, or procedure specified by reference to the number, symbol, or title of a specific specification or standard, such as a Commercial Standard, American National Standard, Federal or State Specification, Industry or Government Code, a trade association code or standard, or other similar standard, shall comply with the requirements in the latest revision thereof and any amendments or supplements thereto in effect on the date of Award of the Contract.

C. The code, specification, or standard referred to, except as modified in these Specifications, shall have full force and effect as though printed in these Specifications. These Specifications and standards are not furnished to bidders since manufacturers and trades involved are assumed to be familiar with their requirements. The OWNER/ENGINEER will furnish, upon request, information as to how copies of the referenced specifications and standards may be obtained.

D. Whenever the abbreviation is specified, it shall be understood to mean the full name of the respective organization as listed in paragraph 1.03 of this Section.

1.04 ABBREVIATIONS

A. Whenever the abbreviation is specified, it shall be understood to mean the full name of the respective organization as listed below.

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AI	Asphalt Institute
AIA	American Institute of Architects
AICHE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ARI	Air-Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CALTRANS	State of California Department of Transportation
CBM	Certified Ballast Manufacturers
CGA	Compressed Gas Association
CRSI	Concrete Reinforced Steel Institute
EPA	Environmental Protection Agency
ETL	Electrical Testing Laboratories
FS	Federal Specification
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineer Association
ISA	Instrument Society of America
ITL	Independent Testing Laboratories
MIL	U.S. Military Specification
NEC	National Electrical Code

NEMA	National Electrical Manufacturers Association
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
PPI	Plastics Pipe Institute
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SSPC	Steel Structures Painting Council
SWANA	Solid Waste Association of North America
UBC	Uniform Building Code
UL	Underwriters Laboratories
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USSPWC	Uniform Standard Specifications for Public Works Construction
USBR	U.S. Bureau of Reclamation
WCRSI	Western Concrete Reinforcing Steel Institute

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

(Not Used)

END OF SECTION

SECTION 01190
HEALTH AND SAFETY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General requirements for the protection of Health and Safety of personnel involved in the construction of the Project.

B. General requirements for furnishing services of a Safety Monitor.

C. Preparation of Safety Program.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 02221 - Excavating, Backfilling, Compacting, and Grading

1.03 REFERENCES

A. The CONTRACTOR shall be familiar with the Safety Guidelines as prepared by the Solid Waste Association of North America (SWANA) National Landfill Gas Committee in December 1983. Copies may be obtained by writing to SWANA, 8750 Georgia Avenue, Suite 140, Silver Spring, Maryland 20910, telephone number (301) 585-2898.

1.04 QUALITY ASSURANCE

A. Nothing in this Section shall preclude the CONTRACTOR from complying with the more stringent requirements of the applicable Federal, State, County, OWNER and Industry Standards, rules, and regulations.

1.05 HAZARDOUS SITE CONDITIONS

A. The CONTRACTOR is advised that the construction of this project is being performed over and adjacent to buried wastes and refuse. As these buried materials decompose anaerobically, they will generate landfill gas (LFG), which normally consists of carbon dioxide (CO_2); methane (CH_4), and occasionally hydrogen sulfide (H_2S) and other gases, depending on the composition of the buried materials. These gases usually vent to the atmosphere through the cover soil, but may migrate laterally over 1,000 feet to adjacent areas depending on site and weather conditions.

B. The following landfill and LFG related information is included to assist the CONTRACTOR in developing his Safety Program and is not intended to encompass all steps that may be necessary to protect the workers or to comply with applicable regulations. A copy of the Safety Program shall be submitted to the OWNER and to the ENGINEER for approval seven (7) days prior to beginning construction.

1. Landfill gases usually vent to the atmosphere through the cover soils, but may migrate laterally to adjacent areas depending on site and weather conditions.
2. Landfills have the potential to create hazardous conditions if working conditions are not controlled or recognized. Some of the hazards are:

a. Fires may start spontaneously from exposed and/or decomposing refuse.

b. Fires and explosions may occur from the presence of methane gas.
c. Landfill gases may cause an oxygen deficiency in underground trenches, vaults, conduits, and structures.
d. Hydrogen sulfide, a highly toxic and flammable gas, or other toxic gas may be present.
e. Possible caving of trenches and excavations when working over or in refuse fills.
f. Splash hazards associated with landfill leachate and LFG condensate.

1.06 SAFETY MONITOR

A. The CONTRACTOR shall provide a person who will be designated as the LFG Safety Monitor. The Safety Monitor shall be thoroughly trained in rescue procedures, and in the use of safety equipment and gas detectors. He shall be present at all times during working hours whenever open trenches or excavations are greater than 2 feet in depth, when refuse is exposed, or when LFG is likely to be present.

B. The Safety Monitor shall have appropriate instruments (detector[s]) to test for oxygen deficiency and for the presence of methane gas and hydrogen sulfide gas. A personal gas monitor (such as Lumidor Safety Products PGM13, Gas Tech GX-82, Model 1641, or similar unit[s]) shall be available for this purpose. The Safety Monitor shall periodically calibrate his instruments and regularly test the excavation areas, and other work space for safe working conditions and ensure that appropriate safety equipment is available at the site.

C. The Safety Monitor shall have the delegated authority to order workers on the project site to comply with the LFG safety requirements. Failure to observe his order shall be cause for removal of the worker from the project.

1.07 SAFETY PROGRAM

A. Supplemental to the CONTRACTOR's regular safety program, the CONTRACTOR shall develop and institute a Site Safety Plan to inform all workers and site visitors of the potential for the presence of methane and other landfill gases emanating from the natural decomposition of refuse buried at or near the job site and the importance of safety precautions to ensure the safety of workers and the public. The CONTRACTOR shall also instruct all workers and maintain strict control of construction activities to protect and maintain the integrity of the work features as they are installed.

1.08 SAFETY PRECAUTIONS

A. CONTRACTOR shall carry a current Cal-OSHA trench permit for all trenching and excavation activities greater than five (5) feet in depth.

B. In addition to conforming to the safety rules and regulations of governmental authorities having jurisdiction, the CONTRACTOR shall take the following precautionary measures:

1. Periodically during construction, the work space should be monitored for concentrations of methane, oxygen and hydrogen sulfide. Workers shall not be permitted to enter a workspace where there is an oxygen deficiency or a combustible mixture of gases without appropriate protection. Positive fan-forced ventilation to dilute gas mixtures and avoid oxygen deficiency should be provided when work is necessary in any workspace.
2. Smoking shall be prohibited on site at all times.
3. In the event toxic gases are present at concentrations hazardous to the workers or the general public, the CONTRACTOR shall immediately evacuate all persons from the area until the area is determined safe by the Safety Monitor.
4. Soil shall be stockpiled adjacent to the work space in areas of exposed refuse for fire-fighting purposes.
5. The use of explosives or firearms shall not be permitted on the site.
6. If refuse is exposed during construction activities, it shall be covered as soon as possible after exposure with at least a 6-inch layer of soil. In no event shall the refuse remain exposed overnight, unless otherwise approved by the OWNER/ENGINEER and/or the local health authorities.

7. If refuse is excavated during construction activities, it shall be disposed of as directed by the OWNER/ENGINEER. Refuse may be temporarily stockpiled if covered with a 6-inch layer of soil, provided local health authorities approve. Refuse stockpiles shall be removed from the work site before the end of work each day.
8. CONTRACTOR will be responsible for disposal of all drill cuttings that result from the construction of the work specified in the Contract Drawings and Specifications.
9. Arrangements for waste disposal must be coordinated by the CONTRACTOR. The cost of handling and transporting refuse to the nearest point of disposal shall be considered as included in the contract price for the pay item with which they are used.
10. No welding shall be permitted in trenches, enclosed areas, or over refuse unless performed in areas of the site tested and approved by the Safety Monitor.
11. Combustion engine powered construction equipment used in excavating activities and/or refuse removal operations shall be equipped with vertical exhaust and spark arrestors.
12. Electric motors and controls utilized in excavation areas and in below ground work spaces shall be explosion-proof.
13. As construction progresses, all pipe openings and valves shall be closed as soon as installed to prevent the migration of gases through the pipeline systems.

C. If not already included in the standard safety practices, the CONTRACTOR should include Occupational Health and Safety Act (OSHA) training (29 CFR 1910) and the following measures in his safety program:

1. For all excavations and trenches, the CONTRACTOR shall comply with OSHA regulation, 29 CFR Part 1926, Subpart P for trench safety.
2. Inhalation of landfill gases shall be avoided. Such gases or oxygen-deficient air may cause nausea and dizziness, which could lead to accidents. Work upwind of the excavation where possible, unless the excavation is constantly monitored and declared safe.
3. Workers shall avoid contact with exposed refuse, condensate, or leachate. Irritants or hazardous materials may be present.
4. No excavation or drilled hole greater than 2 feet deep shall be left unattended or left open at any time unless it is securely covered in a safe manner acceptable to the OWNER/ENGINEER or regulatory agency having jurisdiction.
5. Fire extinguishers with a rating of at least A, B, and C shall be available at all times on the site.
6. Startup and shutdown of equipment shall be avoided in areas of exposed refuse.
7. Personnel, when in an open excavation or in the presence of landfill gas, shall be fully clothed with non-sparking cloth, wear shoes with non-metallic soles, and wear a hard hat and safety goggles or glasses. The excavation shall be monitored continuously in a manner satisfactory to the Safety Monitor for the presence of methane, hydrogen sulfide, and oxygen for the duration that personnel are in an excavation. Workers should immediately vacate an excavation if methane, hydrogen sulfide, or oxygen deficiency is detected therein, and shall not be permitted to re-enter the excavation unless satisfactory precautionary measures for a safe work environment are implemented.
8. Assembly of construction work shall be performed outside of trenches or excavations. Prefabricated items shall be lowered into excavations. Only final connections may be made within trenches with the necessary precautions stated.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Trench Safety: Separate measurement for payment will not be made for Trench Safety

B. Site Safety: Separate measurement for payment will not be made for Site Safety.

4.02 PAYMENT

A. Trench Safety: Separate payment will not be made for work or materials associated with Trench Safety. All costs associated with Trench Safety will be considered subsidiary to the applicable item in the Bid Schedule, or incidental to the Contract.

B. Site Safety: Separate payment will not be made for work or materials associated with Site Safety. All costs with Site Safety will be considered subsidiary to the applicable item in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 GENERAL

1.01 SUMMARY

A. This section supplements the requirements specified in the General and Supplementary Conditions. If the requirements of this section and the conditions noted above conflict with each other, the CONTRACTOR shall adhere to the more stringent requirement as determined by the OWNER/ENGINEER.

B. Section Includes: General requirements for the preparation and submission of the following submittals required for the completion of the Work of the Contract:

1. Technical Submittals:

   a. Schedule of Technical Submittals
   b. Shop Drawings
   c. Samples
   d. Product and Performance Data
   e. Manufacturer's Instructions
   f. Design Calculations and Design Drawings

2. General Submittals:

   a. Schedule of General Submittals
   b. Project Construction Schedule
   c. Progress Payment Schedule
   d. Equipment List and Labor Rates
   e. Monthly Progress Reports
   f. Safety Program

3. Submittals Not Requiring Approval:

   a. Weekly Status Reports
   b. Weekly Manhour Reports/Employee Roster
   c. Monthly Schedule Updates
   d. Safety Program

C. All submittals shall be in English.

D. The CONTRACTOR shall submit all submittals to the OWNER/ENGINEER.

E. Technical and General Submittals shall be numerically serialized by type, Technical Submittal with a "T" prefix (T-1, T-2, T-3, etc.) and General Submittals with a "G" prefix (G-1, G-2, G-3, etc.).

F. The CONTRACTOR shall submit the number of copies of each submittal that the CONTRACTOR requires to be returned, plus four (4) copies that will be retained by the OWNER/ENGINEER.

G. The OWNER/ENGINEER will clearly label the submittals as follows and return to the CONTRACTOR:

1. Approved

2. Approved as Noted
3. Revised and Resubmit
4. Rejected
5. Information Only

H. When submittals are returned marked with either "Revise and Resubmit" or "Rejected" the CONTRACTOR shall make such revisions and corrections as required and resubmit the submittal with the same submittal number followed by R1 (Revision One). Example: T-5 - R1.

1.02 RELATED SECTIONS

A. General Conditions
B. General Conditions
C. Section 01025 - Measurement and Payment
D. Section 01190 - Health and Safety
E. Section 01400 - Quality Control
F. Section 1630 - Product Options & Substitutions
G. Section 01720 - Project Record Documents

1.03 TECHNICAL SUBMITTALS

A. Schedule of Technical Submittals:

1. The CONTRACTOR shall prepare and submit a Technical Submittals Schedule listing all technical submittals required by this Section.

2. The Technical Submittals Schedule shall separate submittals by major specification section. This Schedule shall include submittal delivery dates, required return dates, material delivery dates, and other pertinent data required to ensure that the project schedule is met by the CONTRACTOR.

3. This Schedule shall be monthly updates to reflect progress and any additions or deletions to the submittal schedule. Copies of the updated schedule shall be furnished to the OWNER/ENGINEER during the first week of each calendar month.

B. Shop Drawings:

1. Shop drawings shall establish the actual detail of all manufactured or fabricated items, indicate proper relation of adjoining work, and incorporate minor changes of design or construction to suit actual conditions. Shop drawings shall be drawn to scale and shall be completely dimensioned.

2. Sheet sizes of shop drawings shall be 8 1/2 inches x 11 inches, 11 inches x 17 inches, 17 inches by 22 inches, 22 inches x 23 inches, or 34 inches x 44 inches.

3. A clear space of 3 inches by 3 inches shall be provided on each drawing for the OWNER/ENGINEER's review stamp and comments.

4. Shop drawings shall be submitted to the OWNER/ENGINEER in the form of a reproducible transparency, in addition to the copies required by Article 1.01F.

5. After the OWNER/ENGINEER has completed his review of shop drawings, he will return copies to the CONTRACTOR indicating the approval status as described in Article 1.01.G.

6. The OWNER/ENGINEER will review and generally return shop drawings within ten (10) days of receipt by the OWNER/ENGINEER.

C. Samples:

1. The CONTRACTOR shall furnish the OWNER/ENGINEER at least three (3) samples of each of the various materials, except field samples, together with the finish thereon, as specified for and intended to be used on or in the work.

2. The CONTRACTOR shall submit all samples to the OWNER/ENGINEER at least 10 days before purchasing, fabricating, applying, or installing such materials and finishes, unless otherwise stated. The OWNER/ENGINEER will review the samples for visual aspects such as kind, color, pattern, and texture, and will approve or ask for resubmittal of samples generally within 10 days of the CONTRACTOR's submittal. Approvals of samples will be given by the OWNER/ENGINEER in writing.

3. Unless otherwise specified in the various sections of these Specifications, the CONTRACTOR shall submit all samples, other than field samples, in triplicate. A cover letter shall accompany the sample and shall list all items being transmitted, designating their particular usage and location in the project.

4. After the OWNER/ENGINEER has performed his review and analysis of samples, two samples will be retained and the remaining sample will be returned to the CONTRACTOR, with the OWNER/ENGINEER's comments.

5. Samples shall be submitted and resubmitted until approved as satisfactory. Each change in manufacturing process or batch shall require submittal of samples for approval. Approval of a sample shall not be taken in itself to change or modify any contract requirement. All materials, color, pattern and texture in the completed building or structure shall be equal in every respect to that of the approved samples.

6. Each sample shall be identified completely as to product, color, manufacturer, trade name, lot, style, model, location of use, and Contract Document reference, as well as the names of the CONTRACTOR, Supplier, Project and OWNER.

7. Test samples, as designated by the OWNER/ENGINEER, may also be selected from the materials or equipment delivered by the CONTRACTOR to the site for use in the work. If any test sample fails to meet the specification requirements, such materials or equipment which fail the testing, shall be removed and replaced by the CONTRACTOR with materials or equipment meeting the Specification requirements.

8. Field samples shall be prepared at the site by the CONTRACTOR in the manner and number as specified in these Specifications. Affected finish work shall not be commenced until the OWNER/ENGINEER has approved the field samples, in writing.

D. Product and Performance Data:

1. Each copy shall be marked to identify applicable products, models, options, performance and other data; manufacturers' standard data shall be supplemented to provide information unique to the work.

2. The CONTRACTOR shall submit the number of copies which the CONTRACTOR requires to be returned, plus four (4) copies which will be retained by the OWNER/ENGINEER.

E. Manufacturer's Instructions: When required by the manufacturer's warranty requirements, the CONTRACTOR shall submit manufacturer's printed instructions for delivery, storage, shelf life, assembly, installation, adjusting, and finishing.

F. Design Calculations and Design Drawings:

1. Design Calculations: When specified in the Specifications or the Contract Drawings, or requested by the OWNER/ENGINEER, design calculations shall be submitted to the OWNER/ENGINEER for review with all pertinent data, assumptions, objective, criteria, applicable codes, standards and references. The calculations shall be on 8-1/2 by 11-inch or 11 by 17-inch sheets. Each design calculation set shall bear page numbers, titles, revision numbers, date and calculation number. Where multiple number of items are designed in a particular system, the calculations shall be preceded by a table of contents.

2. Design Drawings:

   a. When specified in the Specifications or the Contract Drawings, or requested by the OWNER/ENGINEER, design drawings shall be submitted to the OWNER/ENGINEER or review.

   b. Pertinent requirements of Article 1.03.B of this Section shall be applicable for submittal of design drawings.

G. Certificates of Compliance:

1. The CONTRACTOR shall submit certificates of compliance for certain materials and products in lieu of the specified sampling and testing procedures as specified in each Specification section. Submit certificates required for demonstrating proof of compliance of materials with specification requirements in duplicate with each lot of material delivered to the Work. The lot so certified shall be clearly identified by the certificate. Certificates shall be signed by an authorized representative of the producer or manufacturer and shall state that the material complies in all respects with the requirements of the Contract Documents. In the case of multiple shipments, each shipment shall be accompanied by a certificate of compliance.

2. The certificate of compliance shall be accompanied by a certified copy of test results or shall state that such test results are on file with the producer or manufacturer and shall be furnished to the ENGINEER on request. The certificate shall give the information specified for samples in Paragraph C above, the name and address of the organization performing the tests, the date of the tests, and the quantity of material shipped.

3. Materials used on the basis of a certificate of compliance may be sampled and tested at any time. The fact that material is used on the basis of a certificate of compliance shall not relieve the CONTRACTOR of responsibility for incorporating material in the Work that conforms to the requirements of the Contract and any such material not conforming to such requirements will be submit to rejection, whether in place or not.

4. The ENGINEER reserves the right to refuse to permit the use of certain materials on the basis of a certificate of compliance.

1.04 GENERAL SUBMITTALS

A. Schedule of General Submittals: The CONTRACTOR shall prepare and submit a Schedule of General Submittals listing all General Submittals required by this Section.

A. Schedules and Reports:

1. The CONTRACTOR shall prepare and submit Schedules and Reports in accordance with the requirements of this Section.

2. The schedules and reports shall describe the CONTRACTOR's work plan in sufficient detail as delineated below to provide:

   a. Assurance to the OWNER/ENGINEER that the finished work complies accurately with the Contract Documents,

   b. A basis for determining the progress of the work.

   c. A basis for the OWNER's internal planning activities.

3. Within ten calendar days after Notice to Proceed, the CONTRACTOR shall provide the OWNER/ENGINEER with initial copies of the General Submittals specified in this Section.

4. The schedules shall be in a reproducible form, prepared to the same scale or may be combined as approved by the OWNER/ENGINEER.

5. Unless otherwise specified, the schedules shall be presented in graphic format and shall be updated for each construction meeting at least monthly, and transmitted to the OWNER/ENGINEER.

6. The CONTRACTOR shall obtain approval of the various schedules specified in this Section before submitting the first application for payment. Schedule revisions also require OWNER/ENGINEER approval.

B. Project Construction Schedule:

1. Scheduling: A preliminary issue of the Project Construction Schedule shall be prepared by the CONTRACTOR and submitted with the bid. Ten (10) days after receipt of Notice to Proceed the CONTRACTOR shall submit the Project Construction Schedule for approval and issue the approved Project Construction Schedule ten days after receipt of approval and comments from the OWNER/ENGINEER.

2. Format: The Project Construction Schedule shall consist of the following items, each compatible with the other and developed from the same basis:

   a. Schedule: Bar Chart or Critical Path Method (CPM)

   b. Critical Milestone Dates as listed below.

      1) Start/complete mobilization.
      2) Start/complete earthwork for blower/flare facility
      3) Start/complete construction of concrete foundations
      4) Start/complete installation of the blowers, flare, and piping
      5) Start/complete installation of a condensate collection and disposal system
      6) Start/complete installation of the vertical landfill gas extraction
      7) Start/complete landfill gas collection and controls system piping
      8) Start/complete system start-up
      9) Start/complete final inspection
      10) Start/complete demobilization

3. Computer Generated Schedule: The CONTRACTOR may generate the CPM Schedule manually or by using a computer. The CPM Schedule shall include all significant items of Work.

4. Comments Incorporated: The CONTRACTOR shall incorporate the OWNER/ENGINEER's comments into revisions of the Project Construction Schedule, adjust the manpower loading as

required and resubmit the schedule to the OWNER/ENGINEER for approval along with a summary of the changes.

5. Revised schedule, if required, will be given a new revision number and submitted to the OWNER/ENGINEER for approval.

C. Progress Payment Schedule:

1. Progress Payment Schedule: The CONTRACTOR shall submit a proposed Progress Payment Schedule which coincides with the Project Construction Schedule. The Progress Payment Schedule shall b by month and shall total the contract price as awarded. A proposed schedule will be required a the pre-construction conference.

2. The Schedule of Payments will be subject to modification by, and approval of, the OWNER/ENGINEER. If the Schedule is unbalanced beyond reasonable consideration, the CONTRACTOR will be required to revise the Schedule within reasonable consideration, the CONTRACTOR will be required to revise the Schedule within reasonable limits as directed.

3. Modifications: Changes shall be made and submitted with each Schedule Revision and/or each executed Contract Price change in accordance with the requirements of the General Conditions.

E. Equipment List and Labor Rates: The CONTRACTOR shall submit Equipment List and Labor Rates Schedule for use in conjunction with any Force Account Work done on a time and material basis, to determine compensation to the CONTRACTOR. The schedule shall include all equipment and personnel that the CONTRACTOR expects to use on this project. It shall also include any other equipment and personnel that the CONTRACTOR has available that may be used on the Project. The rate shall include all costs and constitute full payment to the CONTRACTOR for use of operated equipment and personnel. This list shall be submitted with the bid.

D. Monthly Progress Reports:

1. The CONTRACTOR shall submit a Monthly Progress Report, listing all construction activities and their schedule completion dates. Activities shall show the percent of completion and the days required for completion, and shall include milestone events that occurred during the month.

2. A Monthly Progress Report format shall be furnished by the CONTRACTOR for approval by the OWNER/ENGINEER at the preconstruction conference.

3. Three copies of each Monthly Progress Report shall be forwarded to the OWNER/ENGINEER no later than the fifth working day after the last working day the Report is based on.

4. Other Requirements: Requests for progress payments shall be accompanied by the latest pertinent report.

G. Safety Program: A preliminary Safety Program shall be prepared by the CONTRACTOR for presentation and discussion at the preconstruction meeting. The CONTRACTOR's Safety Monitor shall be named and be present at the preconstruction meeting. Although the Safety Program will not be formally approved, the OWNER will review and comment on its adequacy.

1.05 SUBMITTALS NOT REQUIRING APPROVAL

A. The CONTRACTOR shall furnish the following submittals for information only. These submittals will not be approved and returned to the CONTRACTOR.

1. Weekly Status Reports: The CONTRACTOR shall submit a Weekly Status Report to the OWNER/ENGINEER by Friday noon. The report shall be on a form satisfactory to the OWNER/ENGINEER, and shall include items such as a Summary of Work completed and a Two-Week Look Ahead Bar Chart.

2. Weekly Manhour Reports/Employee Roster: The CONTRACTOR shall provide a weekly employee roster listing all CONTRACTOR and subcontractor employees. The subcontractor shall also tabulate total manhours worked each week including manhours spent by subcontractor's personnel, craft, supervision, and management, and submit this information to the OWNER/ENGINEER. The manhour report shall include separate totals for each craft and administrative classification.

3. Monthly Schedule Updates: The CONTRACTOR shall submit an updated schedule, with the Critical Milestone clearly identified, by the first of each month. The status of the Schedule shall indicate percent complete by activity and remaining duration of in-progress activities.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 SUMMARY

A. Separate measurement for payment will not be made for work required under this Section

4.02 PAYMENT

A. Separate payment will not be made for work required under this Section. All costs in connection therewith shall be considered to be incidental to the applicable related items of Work to which they pertain.

END OF SECTION

SECTION 01400
QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

This section supplements the requirements specified in the General and Supplementary Conditions. If the requirements between this section and the conditions noted above conflict with each other, the CONTRACTOR shall adhere to the more stringent requirement as determined by the OWNER/ENGINEER.

A. Section Includes:

1. Acceptance testing by the OWNER/ENGINEER
2. Control testing by the CONTRACTOR, and
3. Certificates of compliance

B. Related Sections:

1. General Conditions
2. Supplementary Conditions
3. Submittals

1.02 SOURCE OF MATERIALS

A. The CONTRACTOR shall notify the OWNER/ENGINEER in writing of the sources from which he proposes to obtain material requiring approval, ,certification, or testing. Such notification shall be made as soon as possible after award of Contract but no later than 15 days after receipt of the Notice to Proceed.

1.03 ACCEPTANCE TESTING

A. Acceptance testing is the testing of materials prior to their use in the work and also any testing deemed necessary by the OWNER/ENGINEER for acceptance of the completed work. The OWNER/ENGINEER will perform acceptance testing of materials and workmanship in accordance with the Contract Documents and reserves the right to perform additional testing at any time to determine conformance with the Contract Documents.

B. Acceptance testing by the OWNER/ENGINEER is not to be considered as a replacement for control testing conducted by the CONTRACTOR or a manufacturer producing materials for the CONTRACTOR. Acceptance testing will be at the expense of the OWNER.

1.04 CONTROL TESTING

A. Control testing is the testing of materials prior to their delivery from a manufacturer, or during construction, such as soils tests before and after compaction, concrete tests during placement, except for concrete strength tests which will be performed by the OWNER/ENGINEER, and such other tests as are specified in the various sections of the Specifications to ensure compliance with the Contract Documents. The CONTRACTOR shall assume full responsibility for control testing and give sufficient notice to the

OWNER/ENGINEER to permit him to witness the tests. Control testing shall be at the expense of the CONTRACTOR and shall be performed by an independent testing firm.

B. The CONTRACTOR shall submit the name, address, and qualifications, together with the scope of proposed services, of the proposed testing firm to the OWNER/ENGINEER for approval at least 15 days prior to the scheduled commencement of any work involving such testing. Should the CONTRACTOR desire to use more than one firm for control testing, the required information shall be submitted for each proposed firm as specified herein.

1.05 TEST REPORTS

A. Within 5 days after completion of testing performed by or for the CONTRACTOR, the test results shall be submitted to the OWNER/ENGINEER. Test reports shall be identified with the information specified for samples in Section 01300 and additionally, the name and address of the organization performing the test, and the date of the tests.

1.06 CERTIFICATES OF COMPLIANCE

A. The CONTRACTOR may use certificates of compliance for certain materials and products in lieu of the specified sampling and testing procedures. Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be submitted in duplicate with each lot of material delivered to the work. The lot so certified shall be clearly identified by the certificate. Certificates shall be signed by an authorized representative of the producer or manufacturer and shall state that the material complies in all respects with the Contract requirements. In the case of multiple shipments, each shipment shall be accompanied by a certificate of compliance.

B. The certificate of compliance shall be accompanied by a certified copy of test results or shall state that such test results are on file with the producer or manufacturer and shall be furnished to the OWNER/ENGINEER on request. The certificate shall give the information specified for samples in Section 01300, the name and address of the organization performing the tests, the date of the tests, ad the quantity of material shipped.

C. Materials used on the basis of a certificate of compliance may be sampled and tested at any time. The fact that material is used on the basis of a certificate of compliance shall not relieve the CONTRACTOR of responsibility for incorporating material in the work which conforms to the requirements of the Contract and any such material not conforming to such requirements will be subject to rejection, whether in place or not.

D. The OWNER/ENGINEER reserves the right to refuse to permit the use of certain materials on the basis of a certificate of compliance.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. Separate measurement or payment will not be made for work required under this section. All costs in connection therewith will be considered incidental to the item or items of work to which they pertain.

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES

PART 1 GENERAL

1.01 SUMMARY

A. This section supplements the requirements specified in the General and Supplementary Conditions. If the requirements of this section and the conditions noted above conflict with each other, the CONTRACTOR shall adhere to the more stringent requirement as determined by the OWNER/ENGINEER.

B. Section Includes: Construction facilities (temporary facilities) required for the construction of the permanent facilities specified under the Scope of Work of this Contract.

A. Construction facilities shall include furnishing of all equipment, materials, tools, accessories, incidentals, labor, and performing all work for the installation of equipment and for construction of facilities, including their maintenance, operation, and removal, if required, at the completion of the Work under the Contract.

1.02 RELATED SECTIONS

A. General Conditions

B. Supplementary Conditions

C. Section 01019 - Mobilization and Demobilization

D. Section 01560 - Temporary Controls

1.01 DESCRIPTION

A. Construction facilities shall include, but not be limited to the following temporary offices, utilities, equipment, materials, facilities, and services:

1. Field Office
2. Parking Areas
3. Temporary Access Roads
4. Storage of Materials and Equipment
5. Construction Equipment
6. Temporary Sanitary Facilities
7. Temporary Electric Power
8. Temporary Water
9. Temporary Heating and Cooling
10. Temporary Telephone Service

11. First Aid Facilities

12. Security

13. Trash receptacles

1.04 REFERENCES

A. Construction facilities shall also be constructed/installed, maintained and operated in accordance with the applicable Federal, State, County, and Utility laws, rules, permits and regulations. Notwithstanding contrary provisions of General Conditions, Supplementary Conditions, and Standard Specifications, nothing in the Contract Drawings and Specifications shall be construed to permit work not conforming to the above.

1.05 GENERAL REQUIREMENTS

A. The CONTRACTOR shall be responsible for furnishing, installing, constructing, operating, maintaining, removing and disposing of the facilities, as specified in this Specification, and as required by the OWNER/ENGINEER for the completion of the Work under the Contract.

B. Construction facilities shall be located as approved by the OWNER, and maintained in a clean, safe and sanitary condition at all times until completion of the Contract. Construction facilities shall not interfere with ongoing site operations or other construction activities.

C. Upon completion of the Contract, areas impacted by construction facilities shall be restored in the status specified in Article 1.20 of this Section.

D. The requirements specified herein are in addition to any requirements specified elsewhere in the Contract Documents. Construction facilities shall meet the requirements for all-weather service.

E. Land disturbances related to the construction facilities shall be minimized to the greatest extent possible and the land restored to the extent practical, to its original contours by grading to provide positive drainage and by seeding the area to match with existing vegetation.

F. Utilities shall be designed and constructed to provide uninterrupted service.

1.06 FIELD OFFICE

A. CONTRACTOR shall provide an office for his own staff.

B. The CONTRACTOR shall meet with the OWNER and discuss field office requirements prior to mobilizing such facilities at the site.

1.07 PARKING AREAS

A. CONTRACTOR shall provide parking area for maintenance and delivery vehicles, the OWNER/ENGINEER's and CONTRACTOR's representatives, and for other authorized visitors, as approved by the OWNER.

1.08 ACCESS ROADS

A. Existing access roads shall be used for the convenience of the CONTRACTOR in the performance of the Work under this Contract. Construction vehicles are prohibited from traveling on the face of landfill slopes, except when specifically approved the OWNER/ENGINEER.

1.09 STORAGE OF MATERIALS AND EQUIPMENT

A. CONTRACTOR shall make arrangements for storage areas for materials, equipment, and debris. Locations and configurations of such facilities shall be subject to the approval of the OWNER/ENGINEER.

B. All operations of the CONTRACTOR, including storage of materials, shall be confined to approved areas. CONTRACTOR shall be liable for any and all damage caused by him during such use by him of property of the OWNER or other parties. Materials shall be stored in accordance with manufacturer's instructions as applicable.

C. CONTRACTOR shall store construction materials and equipment within boundaries of designated areas. Storage of gasoline or similar fuels shall conform to the requirements specified in Article 1.05 of Section 01560.

1.10 CONSTRUCTION EQUIPMENT

A. CONTRACTOR shall erect, equip, and maintain all construction equipment in accordance with all applicable statutes, laws, ordinances, rules and regulations of the OWNER or other authority having jurisdiction.

B. Scaffolding, staging, runways, hoists, barricades, and similar equipment required for performance of the Contract shall be provided and maintained by the CONTRACTOR. Hoists or similar equipment shall be provided with operators and signals, as required.

C. CONTRACTOR shall provide, maintain, and remove upon completion of the Work, all temporary rigging, scaffolding, hoisting equipment, debris boxes, barricades around openings and excavations, fences, ladders, and all other temporary work, as required for all work hereunder unless otherwise directed by the OWNER/ENGINEER.

D. Construction equipment and temporary work shall conform to all the requirements of state, county, and local authorities, OSHA, and underwriters, which pertain to operation, safety, and fire hazard. CONTRACTOR shall furnish and install all items necessary for conformity with such requirements, whether or not called for under separate sections of these Specifications.

1.11 TEMPORARY SANITARY FACILITIES

A. CONTRACTOR shall provide temporary sanitary facilities for use by all employees and persons engaged in the Work, including lower-tier subcontractors, their employees, and authorized visitors.

B. Sanitary facilities include enclosed chemical toilets and washing facilities. The facilities shall meet the requirements of local public health standards. Open pit or trench latrines will not be permitted.

C. Sanitary facilities shall be located as approved by the OWNER/ENGINEER, and shall be maintained in a sanitary condition during the entire course of the Work.

1.12 TEMPORARY ELECTRIC POWER

A. The CONTRACTOR shall provide and maintain during the course and progress of the Work all electrical power and wiring requirements to facilitate the work of all trades and services associated with the Work. The CONTRACTOR shall make arrangements with the applicable serving utility company or provide generators and shall pay all charges for providing and maintaining electrical service including usage costs at the site. All temporary wiring, feeders, and connections shall be furnished by the CONTRACTOR.

B. Routing of temporary conductors, including welding leads, shall not create a safety hazard nor interfere with operation and maintenance of existing facilities.

C. All temporary wiring installed by the CONTRACTOR shall be accomplished in accordance with the applicable requirements of the local electrical code.

1.13 TEMPORARY WATER

A. Drinking Water: CONTRACTOR shall provide drinking water in bottles from an approved source at no additional cost to the OWNER.

B. Construction Water: The CONTRACTOR is responsible for providing any additional water required to complete the work in accordance with the Contract Documents.

1.14 TEMPORARY HEATING AND COOLING

(Not Used)

1.15 FIRST AID FACILITIES

A. First aid equipment and supplies shall be provided to serve all personnel at the site. The first aid facilities shall be equipped as required by authorities having jurisdiction.

1.16 TRASH RECEPTACLES

A. The CONTRACTOR shall meet with the OWNER and discuss options for trash receptacles prior to mobilizing such facilities at the site.

1.17 SECURITY

A. The CONTRACTOR shall make all necessary provisions and be responsible for the security of the Work and the Site until final inspection and acceptance of the Work.

1.18 SHUT-DOWN TIME OF SERVICES

A. The CONTRACTOR shall not disconnect or shut down any part of the existing utilities and services, except by express permission of the OWNER/ENGINEER. The CONTRACTOR shall submit a schedule of estimated shut-down time in order to obtain such permission, and shall notify all interested parties, as required.

1.19 MAINTENANCE

A. General: CONTRACTOR shall maintain all construction facilities, utilities, temporary roads, services, and the like in good working condition as required by the OWNER/ENGINEER during the term of the Contract.

1.20 STATUS AT COMPLETION

A. Upon completion of the Work, or prior thereto, when so required by the OWNER/ENGINEER, the CONTRACTOR shall:

1. Repair damage to existing access road caused or resulting from the CONTRACTOR's work.

2. Remove and dispose of all construction facilities including office trailers, and other facilities and utilities including all concrete foundations. Similarly, all areas utilized for temporary facilities shall be returned to substantially their neat original, natural state, or as otherwise indicated or directed.

3. Obliterate temporary roads built for CONTRACTOR's convenience and restore the area to near original conditions to the extent practicable.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work specified in this Section. Full compensation for such work will be considered to be included in the lump sum price quoted for mobilization in the Bid Schedule.

END OF SECTION

SECTION 01561
CONSTRUCTION CLEANING

PART 1 GENERAL

1.01 SUMMARY

This section supplements the requirements specified in the General and Supplementary Conditions.

A. Section Includes.

1. Cleanup during construction, and

2. Final cleaning of the site prior to acceptance of the Project by the OWNER.

1.02 RELATED SECTIONS

A. General Conditions

B. Supplementary Conditions

C. Section 01500 - Construction Facilities

1.03 GENERAL

A. It is required that the entire site be kept in a neat and orderly condition, and the OWNER or his representative may, at any time during construction, order a general cleanup of the site as a part of the work under this Section.

B. CONTRACTOR shall dispose of waste, trash, and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. The CONTRACTOR shall be required to discuss methods of waste disposal with the OWNER and comply with the requirements and conditions determined by the OWNER. Burning of trash and debris on the site will not be permitted.

1.04 CLEANUP DURING CONSTRUCTION

A. Cleanup: The CONTRACTOR will be required to clean up construction work areas including all office facilities and dispose of waste material as specified in Article 1.03B. Cleanup of construction work areas will be required on a daily basis. At the close of each day's work all small quantities of waste and debris resulting from construction activities and from office facilities shall be gathered up and disposed of. Waste and debris shall not be allowed to accumulate in such quantities as to crease an unsightly appearance, or safety or fire hazard, nor shall it interfere in any way with free access to, and operation of existing facilities.

B. Waste Disposal: The CONTRACTOR shall provide suitable receptacles for all construction office waste material such as wrapping paper, discarded containers, scrap lumber, scrap metals, etc. as specified in Article 1.03B.

1.05 FINAL SITE CLEANUP

A. Prior to final inspection, the entire site shall be thoroughly cleaned and shall be put into a neat, acceptable condition. All construction waste and unused materials, loose rock and stones, excess earth, and debris of any description resulting for the Work shall be removed from the entire site.

B. All pavements and paved walks shall be hosed down and scrubbed clean where necessary.

C. Mortar droppings shall be thoroughly removed from concrete slabs and pavements. All concrete flatwork and exposed vertical surfaces of concrete and masonry shall be hosed down and scrubbed clean.

D. All construction areas shall be thoroughly cleaned to the satisfaction of the OWNER/ENGINEER prior to final acceptance of the completed Contract.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. Separate measurement or payment will not be made for work required under this section. All costs in connection with the work specified herein will be considered incidental to the Contract.

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

This section supplements the requirements specified in the General and Supplementary Conditions. If the requirements of this section and the conditions noted above conflict with each other, the CONTRACTOR shall adhere to the more stringent requirement.

A. Section Includes: General requirements for materials and equipment including handling, transportation, and storage thereof.

1.02 RELATED SECTIONS

A. General Conditions

B. Supplementary Conditions

C. Section 01300 – Submittals

D. Section 01400 – Quality Control

E. Section 01630 – Product Options and Substitutions

1.03 QUALITY OF MATERIALS

A. Materials and equipment provided shall be new, except as may be indicated in the Specifications or the Contract Drawings.

B. The materials and equipment shall be manufactured, handled, transported, stored and used in accordance with the requirement of the manufacturer and to ensure completed work meets the requirements of the Contract Documents.

1.04 HANDLING AND TRANSPORTATION

A. Handling:

1. Avoid bending, scraping, or overstressing materials and equipment. Protect projecting parts by blocking with wood, by providing bracing, or by other approved methods.

2. Materials and equipment shall be protected from soiling and moisture by wrapping or by other approved means.

3. Small parts of equipment and accessories shall be packaged in containers such as boxes, crates or barrels to avoid dispersal and loss. Firmly secure an itemized list and description of contents to each such container.

B. Transportation: Loading, transporting, unloading and storage of all materials and equipment shall be conducted such that they are kept clean and free from damage.

1.05 STORAGE AND PROTECTION

A. Provide sheltered, weathertight or heated weathertight storage as required for materials and equipment subject to weather damage.

B. Provide blocking, platforms or skids for materials and equipment subject to damage by contact with ground.

C. Store packaged materials in their original unbroken package or container.

D. Protect materials and equipment from damage during warehousing operations.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. Separate measurement or payment will not be made for work required under this section. All costs in connection therewith will be considered incidental to the time of work to which they pertain.

END OF SECTION

SECTION 01630
PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for submission of requests for substitutions of products.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 02830 - Chain Link Fences
D. Section 11000 - Equipment
E. Section 15480 - Piping
F. Section 16100 - Basic Electrical Materials and Methods
G. Section 16910 - Control Panels

1.03 SUBSTITUTIONS

A. The CONTRACTOR shall submit to the OWNER/ENGINEER for review a complete list of all materials and equipment which differ in any respect from materials and equipment specified in these Specifications or on the Contract Drawings. Include with this list all materials which are proposed by subcontractors for use in the Work of this Contract and also materials which are not specifically mentioned in the Specifications.

B. Whenever the name, brand, or model of a manufacturer's article, product, item of equipment, or system is specified, it is used as a measure of quality and utility or as standard. No intent to limit competition is inferred or implied. Where more than one manufacturer's name is specified, the first named manufacturer is the basis of design. Second, third, and subsequent named manufacturers shall be considered substitutions, but requests for their substitutions are not required.

C. If the CONTRACTOR desires to use any other brand or manufacture of equal quality, appearance, and utility to the product specified, he shall request substitution as provided herein. The OWNER/ENGINEER will accept as satisfactory or reject the request for substitution, and his decision shall be final. Unless substitutions are requested as provided herein, no such deviations from the Contract Drawings and Specifications will be permitted.

D. Requests for substitutions will be considered only when offered by the CONTRACTOR as follows:

1. Submit complete technical data, including drawings; complete performance specifications; provide test data and perform tests as may be required by the OWNER/ENGINEER; submit samples of the article proposed for substitution, as applicable.
2. Submit comparative data of material, equipment, or system to be replaced by proposed substitution.
3. If Value Engineering is involved in the CONTRACTOR's request or proposal for substitution, the amount to be credited to the OWNER or deducted from the Contract Price if the proposed substitution is accepted, shall be submitted along with a comparative cost breakdown.
4. Include a statement in the transmittal letter, signed by the CONTRACTOR, that the proposed substitution is in full compliance with the Contract Documents.
5. All requests for substitutions, along with required information and exhibits, shall be submitted to the OWNER/ENGINEER.
6. Requests for substitutions shall contain not less than the following information in the heading or subject to the transmittal letter:

a. Project Title and Number
b. Subject (Unit or Division or Work)
c. Contract Drawing and Specification References: Drawing Number and Detail, Specification Section, Article, Paragraph, Subparagraph

E. In the analysis of a proposed substitution for compliance with Specifications, Drawings, and design factors of the Project, consideration will be given to the service, performance, and maintenance experience of all elements of the proposed substitution. To this end, the OWNER/ENGINEER may require prompt advice of not less than three readily accessible, comparable installations of the item proposed for substitution, made within the past five (5) years.

F. The OWNER/ENGINEER may require the CONTRACTOR to furnish a written warranty, with adequate safeguards to the OWNER assuring satisfactory performance of a proposed substitute item or system for a stated minimum period of time, usually one (1) year.

G. If a proposed substitution requires changes in related work which, in the opinion of the OWNER/ENGINEER, constitutes a deviation from Contract requirements or aspects of design, it may be rejected.

H. The CONTRACTOR shall be responsible for the execution of any changes in other parts of his own work or the work of subcontractors, caused by a substitution, at no additional cost to the OWNER.

I. The CONTRACTOR shall not proceed with any substitution until the OWNER/ENGINEER has accepted the substitution as satisfactory, in writing. Such acceptance shall not relieve the CONTRACTOR from complying with the requirements of the Contract Drawings and Specifications.

J. Failure to propose the substitution of any product a minimum of 14 calendar days in advance of the proposed installation may be deemed sufficient cause for the denial of the request for substitution. The OWNER/ENGINEER shall typically render a decision on the suitability of the proposed substitution within ten (10) days of receipt of the request.

K. Any substitutions submitted to the OWNER/ENGINEER which do not comply with the above requirements will be returned to the CONTRACTOR without the OWNER's/ENGINEER's review.

L. Originally specified items shall be furnished, unless a request for substitution is submitted and accepted in accordance with the foregoing requirements.

M. The CONTRACTOR will be responsible for any repermitting and associated costs as a result of a substitution made at the CONTRACTOR's request.

PART 2 PRODUCTS

(Not used)

PART 3 EXECUTION

(Not used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable item in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 01730
INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation and submission of installation, operation and maintenance (O&M) instructions for mechanical and electrical equipment furnished by the CONTRACTOR.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01720 - Project Record Documents
D. Section 11000 - Equipment
E. Section 16910 - Control Panels

1.03 SUBMITTALS

A. The operations and maintenance (O&M) instructions shall incorporate the requirements specified herein. The CONTRACTOR shall integrate instructions from subcontractors with his submittal.

B. The CONTRACTOR shall submit to the OWNER/ENGINEER for review, three sets of O&M instructions no later than 15 days before scheduled shipment of the equipment.

C. One set of O&M instructions will be returned, marked with one of the following notations:

1. Approved.
2. Approved as noted.
3. Revise and resubmit.
4. Rejected.
5. Information Only.

D. Defects discovered during review will be indicated on the O&M instructions or otherwise communicated to the CONTRACTOR in writing upon return of the O&M instructions.

E. Within 15 days after receipt of O&M instructions marked "Rejected" or "Revise and resubmit", the CONTRACTOR shall revise the instructions in accordance with the directions for revision and shall resubmit three sets of the revised instructions for review. The OWNER/ENGINEER will review and return the resubmitted O&M instructions in the same manner and time as specified above for the original submittals.

F. Within 15 days after receipt of O&M instructions marked "Approved" or "Approved as noted," the CONTRACTOR shall revise the instructions in accordance with revisions noted, if any, and shall furnish three sets of O&M instructions in final form.

G. If subsequent modifications to the equipment require revised operation and maintenance procedures, the CONTRACTOR shall revise the O&M instructions to show the equipment as installed. Such revisions shall be by issue of replacement pages to the final O&M instructions, or by reissue of the O&M instructions at the CONTRACTOR's option. The revisions to the O&M instructions shall be submitted not later than 30 days following revision of the equipment.

1.04 MANUFACTURER'S INSTRUCTIONS

A. The title page shall include the name and function of the equipment, manufacturer's identification number, the OWNER's specification number and title, and the address and telephone number of the manufacturer or his representative, and person to contact for service, operation, and maintenance.

B. The contents shall list all section and subsection titles of the instructions with reference to the page on which each starts and a list of included drawings.

C. The descriptive information shall consist of drawings and diagrams, and a physical and a functional description of the equipment including major assemblies and subassemblies.

D. The installation information shall cover preinstallation inspection, installation, calibration, and preparation for operation, both for initial installation and for installation after overhaul.

E. The operation information shall include step-by-step procedures for starting, restarting, operating, shutdown, and emergency requirements. The information shall also include performance specifications and operating limitations.

F. The maintenance information shall include step-by-step procedures for inspection, operation checks, cleaning, lubrication, adjustments, repair, overhaul, disassembly, and reassembly of the equipment for proper operation of the equipment. A list of special tools that are required for maintenance shall be included with the maintenance information.

G. The complete parts list and a list of recommended spare parts shall provide all necessary information, including part number and catalog item numbers if applicable, for identifying parts. Parts or assemblies obtained from another manufacturer shall be identified by the name of that manufacturer and his identifying part number. The size, capacity, or other characteristics of the part shall be supplied if required for identification.

H. The appendix shall include safety precautions, a glossary and, if available at time of submittal, copies of test reports, and other relevant material.

I. All information on material or equipment not used in the work shall be deleted from the O&M Manual.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable item in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation, maintenance, completion, and submission of all project record drawings, specifications and related documents.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01300 - Submittal
D. Section 01730 - Installation, Operation, and Maintenance Instructions
E. Section 02221- Excavating, Backfilling, Compacting, and Grading
F. Section 11000 - Equipment
G. Section 15480 - Piping
H. Section 16100 - Basic Electrical Materials and Methods
I. Section 16910 - Control Panels

1.03 MAINTENANCE OF RECORD DOCUMENTS

A. Maintain at the job site one copy of the following Contract Documents for record purposes:

1. Contract Drawings
2. Specifications
3. Addenda
4. Change Orders
5. OWNER's/ENGINEER's Field Orders
6. Reviewed Shop Drawings
7. Clarifications or Explanatory Drawings and Specifications
8. Inspection Reports
9. Laboratory Test Records
10. Field Test Records

B. Store documents used for record purposes in the field office or other approved location, apart from documents used for construction.

C. Do not use record documents for construction purposes.

D. Make documents available at all times for inspection by the OWNER/ENGINEER and his authorized representatives.

1.04 RECORD DRAWINGS

A. Project Drawings:

1. CONTRACTOR shall maintain "as-built" or Record Drawings of all work and subcontracts, continuously as the job progresses. A separate set of prints, for this purpose only, shall be kept at the job site at all times.

2. These drawings shall be kept up-to-date and reviewed and approved by the OWNER/ENGINEER prior to approval of monthly progress payments.
3. All deviations from the drawings, exact locations of permanent property markers or monuments, all utilities and services, mechanical and electrical lines, details, and other work shall be finally incorporated on the Record Drawings.
4. During the course of construction, actual locations to scale shall be identified on the Record Drawings for all runs of mechanical and electrical work, including all site utilities and services, installed underground, in walls, or otherwise concealed. Deviations from the Contract Drawings shall be shown in detail. All main runs, whether piping, conduit, ductwork, or drain lines shall be located by dimension and elevation.
5. No work shall be permanently concealed until the required information has been recorded.
6. Where the OWNER's/ENGINEER's Drawings are not of sufficient size, scale, or detail, CONTRACTOR shall furnish his own drawings for incorporation of details and dimensions.
7. The final set of Record Drawings shall be signed and dated by the CONTRACTOR and include sufficient record survey data, signed and sealed by a registered land surveyor in State of California to sufficiently locate all major fittings and pipe lengths, and shall be delivered to the OWNER/ENGINEER, prior to the OWNER's acceptance of the Project.

B. Addenda and Change Orders:

1. Changes to the Contract Drawings effected by Addenda, Change Orders, or OWNER's/ENGINEER's Field Orders shall be identified by Addendum, Change Order, or OWNER's/ENGINEER's Field Order number and effective date.
2. When revised drawings are issued as the basis of or along with addenda, these revised drawings shall be incorporated into the Record Drawing set with appropriate annotation.

C. Shop Drawings:

1. One complete set of shop drawings, including manufacturer's printed catalog cuts and data, shall be collected and maintained for record purposes.

1.05 RECORD SPECIFICATIONS

A. Project Specifications:

1. Information, changes, and notes shall be recorded in the specifications in blank areas, such as page margins or the backs of opposite pages, or on separate sheets incorporated into the specifications book. All such information, changes, and notes shall be recorded in red.
2. In each section, in an appropriate location, record the manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
3. The record specifications book shall be complete and shall include all documents and forms listed under Bidding Requirements, Contract Forms, and Terms and Conditions.
4. The record specifications book shall be delivered to the OWNER/ENGINEER prior to the OWNER's acceptance of the project.

B. Addenda, Change Orders, and Field Orders:

1. All Addenda, Change Orders, and OWNER's/ENGINEER's Field Orders shall be incorporated into the front of the specifications book in reverse chronological order.
2. In addition, the changes to the specifications effected by Addenda, Change Order, or Field Order shall be annotated on the affected page or pages of the specifications, or adjacent thereto.

1.06 SUBMITTALS

A. At completion of the project, and before submitting invoice for final payment, deliver record documents to the OWNER/ENGINEER.

B. For project drawings, submit five sets of blueline or blackline prints.

C. Submission of record documents shall be accompanied by a transmittal letter, in triplicate, containing the following information:

1. Date of submission.
2. Project title and number.
3. CONTRACTOR's name and address.
4. Title and number of each record document, shop drawings may be grouped in basic categories or divisions of work.
5. Certification that each document as submitted is complete and accurate.
6. Signature of CONTRACTOR or his authorized representative.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable item in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 02221
EXCAVATING, BACKFILLING, COMPACTING, AND GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide all excavating, backfilling, compacting, and grading at the site to the elevations shown on the Contract Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents.

B. Pipe trenching and backfill where shown on the Contract Drawings.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01052 – Layout of Work and Surveys
C. Section 01090 - References
D. Section 01190 - Health and Safety
E. Section 01300 - Submittals
F. Section 01720 - Project Record Documents
G. Section 03300 - Cast-In-Place Concrete
H. Section 11000 - Equipment
I. Section 15480 - Piping

1.03 REFERENCES

A. ASTM D 1557 - Standard Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10-pound Rammer and 18-inch drop.

B. ASTM D 2216 - Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.

C. ASTM D 2487 - Standard Test Method for Classification of Soil for Engineering Purposes.

D. ASTM D 2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.04 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the OWNER/ENGINEER.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide all materials as shown on the Contract Drawings, as specified herein and as needed for complete and proper construction.

2.02 MATERIALS

A. General: Fill materials will be designated by the OWNER/ENGINEER, and is that material removed from excavation or on-site sources, predominantly non-expansive soils free from roots and other deleterious matter.

B. Vegetative Cover: Shall consist of on-site or imported soil suitable for topsoil which are relatively free of stones or other objectionable debris, which have sufficient humus content to readily support vegetative growth. The suitability of soils for topsoil shall be subject to the approval of the ENGINEER.

C. Select Backfill: Shall consist of any excavated on-site soil classified as CH, CL, SM, SP, SP-SM, SC, and GC, with a maximum plasticity index of 4, and be free of organic materials.

D. Engineered Fill: For subbase of concrete foundation shall consist of 1-1/2-inch maximum Class 2 Aggregate Base in accordance with Caltrans Standard Specifications Section 26-1.02A

E. Sand Bedding: For pipes in trenches shall be in accordance with Caltrans Standard Specifications Section 19-3.025B.

F. Fine-grained Soil: Consists of soils classified as CL, ML, CH, and MH with 50 percent passing the No. 200 sieve.

G. Coarse Gravel: Shall consist of permeable aggregate material, clean, washed, rounded to subrounded, and free of organic matter. Limestone will not be acceptable for this classification. The material shall meet the following gradation requirements:

U.S. Sieve Size	Range of Percent Passing
3 inches	100
2 inches	50 to 100
1 inch	0 to 50
½ inch	5

F. Bentonite: Consists of a premium grade sodium - montmorillonite bentonite with the following properties for a 6% suspension:

Percent Passing No. 200 Sieve (dry)	77 min.
Viscosity – 600 RPM Viscometer	30 min.
Yield Point/Plastic Viscosity Ratio	1.5 max.
Filtrate Loss, 30 minutes @ 100 psi	15 cm^3 max.

(Above in accordance with API and NL Baroid Test Procedures)

H. Road Base: Caltrans Class 2 aggregate base, 1½-inch maximum.

PART 3 EXECUTION

3.01 GENERAL

A. The CONTRACTOR shall excavate to the lines and grades shown on the Contract Drawings and as directed by the OWNER/ENGINEER. Excavated material shall be stockpiled at a location on the landfill property, as directed by the OWNER/ENGINEER. Before commencing any fill or compaction operations, each excavation shall be inspected and approved by the ENGINEER. Inadvertent overexcavation without prior approval of the OWNER/ENGINEER shall be brought to grade with engineered fill. The cost of filling inadvertent overexcavation shall be borne by the CONTRACTOR.

3.02 FINISHED ELEVATIONS AND LINES

A. Comply with pertinent provisions of Section 01052, Layout of Work and Surveys.

3.03 PREPARATION

A. The CONTRACTOR shall take necessary precautions to protect underground pipelines during the course of construction, and especially any piping whose original cover may be temporarily removed during the course of the construction.

B. Protection of Existing Utilities:

1. Unless shown to be abandoned or removed, protect active utility lines and other pipelines shown on the Drawings or otherwise made known to the CONTRACTOR prior to excavating. If damaged, repair or replace at no additional cost to the OWNER.
2. If active utility lines are encountered that are not shown on the Contract Drawings or otherwise made known to the CONTRACTOR, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the OWNER.
4. If existing utilities or facilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the OWNER/ENGINEER and secure his instructions.
5. Do not proceed with permanent relocation of the Work until written instructions are received from the OWNER/ENGINEER.

C. Protection of Persons and Property:

1. Barricade open holes and excavations occurring as part of the Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.
4. Protect the integrity of the landfill, including the landfill's clay cap and vegetative soil layer, from erosion resulting from construction-related activities and precipitation. Providing sufficient erosion control measures at all times (silt fences, hay bales, etc.) to prevent any adverse effects due to erosion. If new or existing facilities are damaged due to erosion effects, repair or replace facilities at no additional cost to the OWNER.

D. Dewatering:

1. Remove all water, including rain water, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.
2. Keep excavations and site construction area free from water.

E. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site. In addition, CONTRACTOR shall provide site dust control measures as required to meet all air quality regulations.

3.04 EXCAVATING

A. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades, and elevations indicated on the Contract Drawings and specified herein.

B. Satisfactory Excavated Materials: Transport to, and place in stockpiles or fill areas within the limits of the Work all excavated materials satisfactory for use as backfill materials as designated by the OWNER/ENGINEER.

C. Unsatisfactory Excavated Materials:

1. If unsatisfactory materials are encountered above or at the design depth of the excavation, excavate the unsatisfactory materials as directed by the OWNER/ENGINEER, and replace with satisfactory materials.
2. Include excavation of unsatisfactory materials, and replacement by satisfactory materials, as part of the work of this Section.

D. Excavation of rock:

1. Where rocks, concrete rubble, or similar material is encountered, and where such material cannot be removed or excavated by conventional earth moving equipment, take required steps to remove or excavate such material by means which will neither cause additional cost to the OWNER.

E. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

F. Surplus Materials: Dispose of unsatisfactory excavated material, and surplus satisfactory excavated material, away from the work area as directed by the OWNER/ENGINEER.

G. Unauthorized Excavation:

1. Unauthorized excavation consist of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the OWNER/ENGINEER.
2. Backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the OWNER/ENGINEER.

H. Stability of Excavations:

1. Slope sides of excavations deeper than 4 feet which are to be entered by workers to 1:1 or flatter, unless otherwise shown, specified, or directed by the OWNER/ENGINEER. Do not undermine adjacent roads or facilities.
2. Shore and brace where sloping is not practical because of space restrictions or stability of the materials being excavated.
3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
4. Trenches shall be barricaded during non-working hours.

I. Shoring and Bracing:

1. Provide all labor and materials for shoring and bracing as may be necessary for safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
2. Maintain shoring and bracing in excavations regardless of the time period excavations will be open.
3. Remove shoring and bracing as excavation and backfilling progresses.

3.05 FILLING, BACKFILLING AND COMPACTING

A. General:

1. For each classification listed below, place acceptable soil material in layers to required thickness and/or elevations.
2. In Excavations: Use satisfactory excavated or borrowed materials.
3. In Trenches: Use backfill material as shown on the construction drawings.

B. Backfill excavations as promptly as progress of the Work permits, but not until completion of the following:

1. Inspecting, testing, approving, and recording locations of underground utilities
2. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
3. Removing trash and debris.

C. Placing and Compacting:

1. Place backfill and fill materials in layers not more than 8 inches in loose depth.
2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
3. Compact each layer of backfill to not less than 90 percent of maximum density as per ASTM D 1557.
4. Do not place backfill or fill material on surfaces that are saturated.
5. Place backfill and fill materials evenly adjacent to structures, to required elevations.

3.06 GRADING

A. General:

1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
2. Smooth the finished surfaces within specified tolerance.
3. Compact with uniform levels or slopes between points where elevations are shown on the Contract Drawings, or between such points and existing grades.
4. Grade area adjacent to concrete slabs or pavement to achieve drainage away from the slabs, and to prevent ponding.
5. Finish the surfaces to be free from irregular surface changes.

3.07 COMPACTING

A. Control soil compaction during construction to provide the minimum percentage of density as determined according to ASTM D 1557.

B. Moisture Control:

1. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests approved by the OWNER/ENGINEER.

3.08 FIELD QUALITY CONTROL

A. Field quality control testing for excavating, backfill, compaction, and grading, shall be provided by the CONTRACTOR. The CONTRACTOR shall submit a field quality control testing program for OWNER/ENGINEER review and approval.

B. Field quality assurance testing for excavating, backfill, compaction, and grading, will be performed by the OWNER's designated soils material testing laboratory.

C. Secure the OWNER's inspection and approval of finish grades before subsequent construction is permitted thereon.

D. If, in the OWNER's opinion based on reports of the testing laboratory, subgrade or fills which have been placed are below specified density, provide and pay for additional compacting as specified under the provisions of Section 01400, Quality Control.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work required under this section.

4.02 PAYMENT

A. Separate payment will not be made for work required under this Section. All costs in connection therewith shall be considered to be incidental to the applicable related items of Work to which they pertain.

END OF SECTION

SECTION 02687
LANDFILL GAS WELLS AND WELLHEADS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All landfill gas wells and wellheads, as shown on the Contract Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 - Product Options and Substitutions
D. Section 01720 - Project Record Documents
E. Section 02221 - Excavating, Backfilling, Compacting, and Grading
F. Section 03300 - Cast-In-Place Concrete
G. Section 15480 - Piping

1.03 SUBMITTALS

A. Product Data: Within 15 calendar days after the CONTRACTOR has received the OWNER's Notice to Proceed, submit five (5) copies of:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's Specifications, catalog cuts, and other data needed to demonstrate compliance with the specified requirements.
3. Shop Drawings and other data as required to indicate method of installing and attaching equipment, except where such details are fully shown on the Contract Drawings.
4. Manufacturer's recommended installation procedures which, when approved by the OWNER/ENGINEER, will become the basis for accepting or rejecting actual installation procedures used for the Work.

1.04 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

C. Regulatory Requirements:

1. Without additional cost to the OWNER, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether or not such materials and associated labor are specified in these Contract Documents.
2. In addition to complying with the specified requirements, comply with the pertinent regulations of governmental agencies having jurisdiction.
3. In the event of conflict between or among specified requirements and pertinent regulations, the more stringent requirement will govern unless otherwise directed by the OWNER/ENGINEER.

D. In addition to complying with the specified requirements, comply with the directions of the OWNER/ENGINEER.

1.05 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be stored and handled in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

2.01 LANDFILL GAS WELLS

A. Provide all materials shown on the Contract Drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to pipe, fittings, joint materials, and backfill materials.

B. Provide pipe materials complying with Specifications for landfill gas collection piping systems as specified in Section 15480.

2.02 LANDFILL GAS WELLHEADS AND CONTROL VALVES

A. Provide landfill gas wellheads, Landtec Accu-flow®, LFG&E Precision Control, or approved equal and appurtenances, as shown on the Contract Drawings. Provide landfill gas collector control valves as shown on the Contract Drawings.

2.03 FERNCO FLEXIBLE COUPLING

A. Provide well head flexible coupling, Fernco or ENGINEER approved equal, as shown on the Contract Drawings. Coupling shall be fabricated from neoprene material and shall be equipped with stainless steel adjustable band clamps. The coupling shall be sized to provide an air tight connection between the well casing and the well head assembly.

2.04 BACKFILL MATERIALS

A. Provide backfill materials as shown on the Drawings in accordance with the fill classification specified in Section 02221.

B. Bentonite: Provide premium grade sodium bentonite clay granules, Benseal or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PROCEDURES

A. Protection of Existing Utilities:

1. Unless shown to be removed, protect active utility lines and other pipelines shown on the Contract Drawings or otherwise made known to the CONTRACTOR prior to excavating. If damaged, repair or replace at no additional cost to the OWNER.
2. If active utility lines are encountered, that are not shown on the Contract Drawings or otherwise made known to the CONTRACTOR, promptly take necessary steps to assure that service is not interrupted.

3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the OWNER.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the OWNER/ENGINEER and secure his instructions.
5. Do not proceed with permanent relocation of the Work until written instructions are received from the OWNER/ENGINEER.

B. Protection of Persons and Property:

1. Securely cover open holes and depressions occurring as part of the Work, and post barricades on property adjacent to or with public access.
2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

C. Use means necessary to prevent dust or odors from coming in contact with or becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

D. Maintain access to adjacent areas at all times.

3.03 DRILLING

A. Locations: Drill borings at the locations shown on the Contract Drawings. Deviations from those locations due to unfavorable site conditions shall be approved by the OWNER/ENGINEER prior to drilling.

B. To minimize disturbance and damage to the landfill cover soils, the CONTRACTOR shall use a low foot-pressure, track-mounted drill rig to drill the well borings. The landfill is covered with a certified final cover system consisting of 12 inches of vegetative soil, overlaying 1-foot of compacted clay soil and 2-feet of foundation layer soil material. A tire-mounted drill rig could potentially cause tire ruts and extensive damage to the cover soils. Any damage to any portion of the final cover system caused by the CONTRACTOR'S operations, will be repaired to the satisfaction of the OWNER/ENGINEER at the CONTRACTOR'S expense. This will include the restoration of the final cover to its pre-existing condition and any re-certification procedures required by state or local agencies.

C. CONTRACTOR shall be responsible for supplying the materials and for constructing (and removing) soil pads (or other stabilizing and leveling methods) for the drill rig at those well locations located on the landfill sideslopes, as required.

D. Dimensions:

1. Drill well borings at the diameter shown on the Contract Drawings and to a depth of five (5) feet above the bottom of the refuse. As the actual base elevation of the landfill is largely unknown, the target well depths may be adjusted by the OWNER/ENGINEER, based on depths achieved in completed wells.

2. Whenever a well boring is completed to the bottom of refuse, backfill borehole with a bentonite seal to an elevation five (5) feet higher than the bottom of refuse prior to installing the well casing and well backfill materials. This is to provide a seal to prevent potential landfill leachate from having a direct avenue into the underlying native soils.

E. Drilling Fluids: Drilling muds or liquids shall not be used.

F. Obstructions: If an impenetrable obstruction is encountered, cease drilling and promptly notify the OWNER/ENGINEER. OWNER/ENGINEER will determine whether to relocate well or complete the well at the achieved depth. Borings determined as insufficient in depth shall be backfilled as specified below and relocated as directed by the OWNER/ENGINEER.

G. Log of Borings: Maintain a written log showing the materials encountered at each depth, depth of each boring drilled, and the time required for drilling.

H. Uncompleted Borings:

1. Avoid leaving uncompleted borings at the end of the day.
2. Provide secure, vandal-proof covers and apply safety precautions for all uncompleted borings.
3. Measure and record depth of uncompleted borings. Redrill collapsed borings to originally achieved depth at no additional cost to OWNER.

I. Refuse Disposal: Promptly remove and dispose of refuse drilling spoils at an acceptable point of disposal approved by the OWNER/ENGINEER. Remove all refuse drilling spoils and wind-blown debris from the work site prior to end of work each day. The method of waste transportation shall be approved by the OWNER/ENGINEER All transported waste shall be fully enclosed within each container or truck bed, and shall be completely covered at all times, while on public roads.

J. Unauthorized Excavation:

1. Unauthorized excavation consists of removal of materials beyond indicated dimensions without specific instructions from the OWNER/ENGINEER.
2. Backfill and compact unauthorized excavations as directed by the OWNER/ENGINEER at no added cost to the OWNER.

K. Prior to placing the well casing or backfill materials into the boring, the boring will be inspected by the OWNER/ENGINEER, or its designated representative, for completion depth and evidence of moisture infiltration. CONTRACTOR shall not proceed with placement of any backfill materials or well casing until this inspection has been completed and the inspector has authorized the CONTRACTOR to proceed.

3.04 WELL CASING FABRICATION

A. Pipe and Fittings: Assemble gas well casings using methods complying with Section 15480.

B. Fabrication:

1. Fabricate well casings sufficiently in advance of installation to achieve complete curing of joints.
2. Fabricate and perforate well casings in accordance with dimensions shown on the Contract Drawings.

3.05 WELL CASING INSTALLATION

A. Install casings and backfill borings as promptly as progress of the Work permits.

B. Set well casing vertically plumb and centered in the boring as shown on the Contract Drawings.

C. Backfilling:

1. Place backfill materials to the elevations and dimensions shown on the Contract Drawings.
2. Place and compact backfill materials in a manner to avoid bridging, overfilling, or damage to the well casing.
3. Place the bentonite seal to the elevations and dimensions shown on the Contract Drawings.
4. Abandoned borings should be backfilled with excavated refuse or native soils. Backfill shall be compacted at 5-foot intervals, with the drilling equipment. The top of each abandoned boring shall be restored back to the landfill cover conditions as it existed prior to the start of drilling.

3.06 SURPLUS BACKFILL MATERIALS

A. Transport and place surplus soil pad and backfill materials in stockpiles or spread in areas as directed by the OWNER/ENGINEER.

3.07 MARKERS

A. Clearly mark well borings and casings to be visible to all others working in vicinity for the duration of the project.

3.08 GRADING

A. General:

1. Restore all areas disturbed by drilling or trenching work to original graded conditions.
2. Uniformly grade the areas to dimensions shown in the Contract Drawings, and smooth the finished surfaces.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Measurement for payment for furnishing and installing landfill gas wells, including drilling, transport and disposal of waste, casing, backfill, and wellhead, will be per linear foot of well boring completed as shown on the Contract Drawings. Measurement will be made from ground surface to bottom of completed hole, to the nearest one-half foot.

B. Separate measurement for payment will not be made for furnishing and installing landfill gas wellheads.

4.02 PAYMENT

A. Payment for furnishing and installing landfill gas wells will be by the unit price per linear foot quoted in the Bid Schedule for "Vertical Extraction Wells".

B. Separate payment will not be made for furnishing and installing landfill gas wellheads.

D. The prices quoted shall include full compensation for furnishing labor, materials, tools, equipment and incidentals including cost of safety program, construction and removal of drilling pads, boring, transport and disposal of excavated materials, pipe and fittings, bentonite plugs, coarse gravel, backfill and wellheads.

E. Payment for drilling and backfilling of borings abandoned due to no fault of the CONTRACTOR will be made at one-quarter the unit price per linear foot quoted for furnishing and installing the completed components.

END OF SECTION

SECTION 02830
CHAIN LINK FENCES

PART 1 - GENERAL

1.01 SUMMARY

A. Provide chain-link fence system as shown on the Contract Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 RELATED WORK

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 -Product Options and Substitutions
D. Section 01720 - Project Record Documents
E. Section 03300 - Cast-In-Place Concrete

1.03 REFERENCES

A. ASTM A 120 - Standard specification for pipe, steel, black and hot-dipped zinc-coated (galvanized), welded and seamless, for ordinary uses.
B. ASTM A 121 - Standard specification for zinc-coated (galvanized) steel barbed wire.
C ASTM A 153 - Standard specification for zinc coating (hot-dip) on iron and steel hardware.

1.04 SUBMITTALS

A. Product Data: Within 15 calendar days after the CONTRACTOR has received the OWNER's Notice to Proceed, submit five (5) copies of:

1. Materials list of items to be provided under this Section.
2. Manufacturer's specifications, catalog cut-sheets, and other data needed to demonstrate compliance with this Section.
3. Shop Drawings and other data as required to indicate method of installing and attaching equipment, except where such details are fully shown on the Contract Drawings.
4. Manufacturer's recommended installation procedures which, when approved by the OWNER/ENGINEER, will become the basis for accepting or rejecting actual installation procedures use for the work.

1.05 QUALITY ASSURANCE

A. Fencing shall be constructed in accordance with all applicable local building codes and ordinances.

B. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this Section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be stored and handled in accordance with the manufacturer's recommendations.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide all materials as shown on the Contract Drawings, as specified, and as needed for a complete and proper installation.

B. Pipe sizes indicated are commercial pipe sizes, Schedule 40.

C. Tube sizes indicated are nominal outside dimensions.

2.02 GALVANIZING

A. On steel framework, fabric, and appurtenances, provide galvanized finish with not less than the following weight of zinc per square foot of surface:

1. Pipe: 1.8 ounces, comply with ASTM A 120.
2. Hardware and Accessories: Comply with Table 1 of ASTM A 153.
3. Fabric: 2.0 ounces, comply with Class II of ASTM A 121.

2.03 FABRIC

A. Provide Number 9 gage or 0.148-inch wires in 2-inch mesh, with top and bottom selvages twisted and barbed.

B. Provide fabric in one piece widths.

2.04 POSTS, RAILS, AND ASSOCIATED ITEMS

A. End, Corner, Slope, and Pull Posts: Provide at least the following minimum sizes and weights:

Material and Dimensions	Pounds Per Linear Foot
Pipe, 2.875-inch Outside Dimension	5.79

B. Line Posts: Provide minimum sizes and weights as follows:

Material and Dimensions	Pounds Per Linear Foot
Pipe, 2.375-inch Outside Dimension	3.65

C. Gate Posts: Provide gate posts for supporting single leaf gate, or one leaf of a double gate installation, for nominal gate widths as follows:

10 feet wide or less:

Material and Dimensions	Pounds Per Linear Foot
Pipe, 4-inch Outside Dimension	9.10

D. TopRails:

1. Use 1.660-inch outside diameter pipe weighing 1.80 pounds per linear foot.
2. Provide in manufacturer's longest lengths, with expansion type couplings approximately 6 inches long for each joint.

3. Provide means for attaching top rail securely to each gate, corner, pull, slope, and end post.

E. Post Brace Assemblies:

1. Provide at end and gate posts, and at both sides of corner, slope, and pull posts, with the horizontal brace located at mid-height of the fabric.
2. Use 1.660-inch outside diameter pipe weighing 1.80 pounds per linear foot for horizontal brace.
3. Use 3/8-inch-diameter steel rod with turnbuckle for diagonal truss.

F. Tension Wire: Provide Number 7 gage galvanized coiled spring wire at bottom of fabric.

G. Post Tops:

1. Provide steel, wrought iron, or malleable iron, designed as weather tight closure cap.
2. Provide one cap for each post.
3. Provide caps with openings to permit through passage of top rail.

H. Stretcher bars:

1. Provide one-piece lengths equal to full height of fabric, with a minimum cross section of 3/16 inch x ¾ inch.
2. Provide one stretcher bar for each gate and end post, and two for each corner, slope, and pull post, except where fabric is woven integrally into the post.

I. Stretcher bar bands:

1. Provide steel, wrought iron, or malleable iron, spaced not over 15 inches on centers, to secure stretcher bars to end, corner, pull, slope, and gate posts.
2. Bands may be used also with special fittings for securing rails to end, corner, pull, slope, and gate posts.

2.05 GATES

A. General: Gate shall be of the offset, roller/rail type.

1. Fabricate gate perimeter frames of tubular members.
2. Provide additional horizontal and vertical members to assure proper operation of the gate, and for attachment of fabric, hardware, and accessories.
3. Space frame members not more than 8 feet apart.
4. Fabricate gate frames from

Material and Dimensions	Pounds Per Linear Foot
Pipe, 1.90-inch Outside Dimension	2.72

B. Fabrication:

1. Assemble gate frames by welding with special malleable or pressed steel fittings and rivets for rigid connections.
2. Same fabric as used in the fence.
3. Install fabric with stretcher bars at vertical edges as a minimum.
4. Attach stretchers to gate frame at not more than 15 inches on centers.
5. Attach hardware with rivets or by other means which will provide security against removal and breakage.
6. Provide diagonal cross-bracing consisting of 3/8-inch diameter adjustable length truss rods on gates where required to provide frame rigidity without sag or twist.

C. Gate Hardware: Provide Following For Each Gate

1. Rollers:

   a. Pressed or forged steel, or malleable iron, to suit the gate size.

2. Latches:

   a. Provide forked type or plunger-bar type to permit operation from either side of the gate.
   b. Provide padlock eye as integral part of latch.

3. Provide keeper for vehicle gates, which automatically engages and holds gate in the open position until manually released.

2.06 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Wire Ties:

1. For tying fabric to line posts, use Number 9 gage wire ties spaced 12 inches on centers.
2. For tying fabric to rails and braces, use Number 9 gage wire ties spaced 24 inches on centers.
3. For tying fabric to tension wire, use Number 11 gage hog rings spaced 24 inches on centers.
4. Manufacturer's standard wire ties will be acceptable if of equal strength and durability.

B. Concrete: Provide 3,000 psi concrete conforming to Section 03300, Cast-In-Place Concrete

C. Barbed Wire:

1. Provide barb wire consisting of double strands of 12-1/2-gage steel wire, twisted with 2 point 14-gage barbs, conforming to ASTM A121 for Class II galvanizing.
2. Provide "V" arm type extensions for barbed wire, of pressed steel or malleable iron.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. General:

1. Install posts at a maximum spacing of 10 feet on centers.
2. Install corner or slope posts where changes in line or grade exceed a 30 degree deflection.

B. Excavating:

1. Drill holes for post footings in firm, undisturbed, or compacted soil, strictly adhering to the dimensions and spacing shown.
2. Post hole dimensions.

   a. Provide 36-inch deep by 8-inch diameter foundations for line posts for fabric heights exceeding 5 feet.

b. Provide 36-inch deep by 12-inch diameter foundations for all other posts.

3. Spread soil from excavations uniformly adjacent to the fence line, or on adjacent areas of the site if so directed.
4. When solid rock is encountered near the surface, drill into rock at least 12 inches for line posts and at least 18 inches for end, pull, gate, and corner posts. Drill hole at least 1 inch greater diameter than the largest dimension of the post to be placed.
5. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed minimum depths specified above.

C. Setting Posts:

1. Remove loose and foreign materials from sides and bottoms of holes, and moisten soil prior to placing concrete.
2. Center and align posts in holes.
3. Place concrete around posts in a continuous pour and vibrate or tamp for consolidation.
4. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.
5. Trowel tops of footings and slope or dome to direct water away from posts.
6. Extend footings for gate posts to the underside of bottom hinge.
7. Set keeps, stops, sleeves, and other accessories into concrete as required.

D. Concrete Strength:

1. Allow concrete to attain at least 75 percent of its minimum 28-day strength before rails, tension wires, and/or fabric is installed.
2. Do not, in any case, install such items in less than 7 days after placement of concrete.
3. Do not stretch and tension fabric and wire, and do not hang gates, until concrete has attained its full design strength.

E. Rails and Bracing:

1. Install fence with a top rail and bottom tension wire.
2. Install top rails continuously through post caps or extension arms, bending to radius for curved runs.
3. Provide expansion couplings as recommended by the fencing manufacturer.
4. Provide bracing to the midpoint of the nearest line post or posts at all end, corner, slope, pull, and gate posts.
5. Install tension wires parallel to the line of fabric by weaving through the fabric, and tying to each post with not less than Number 6 gage galvanized wire, or by securing the wire to the fabric.

F. Installing Fabric:

1. Leave approximately 2 inches between finish grade and bottom selvage.
2. Excavate high points in the ground to clear the bottom of the fence.
3. Place and compact fill to within 1 inch of the bottom of the fabric in depressions.
4. Pull fabric taut and tie to posts, rails, and tension wires.
5. Install fabric on outward facing side of fence, and anchor to framework so that the fabric remains in tension after pulling force is removed.
6. Install stretcher bars by threading through or clamping to fabric on 4-inch centers, and secure to posts with metal bands spaced 15 inches on centers.

G. Installing Gates:

1. Install gates plumb, level, and secure for full opening without interference.

2. Install ground-set items in concrete for anchorage in accordance with the fence manufacturer's recommendations as approved by the OWNER/ENGINEER.
3. Lubricate and adjust the hardware for smooth operation.

H. Miscellaneous:

1. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns.
2. Bend ends of wire to minimize hazards to persons and clothing.
3. Fasteners:

   a. Install nuts for tension bank and hardware bolts on side of fence opposite fabric side.
   b. Peen the ends of bolts to prevent removal of nuts.

4. Repair coatings damaged in the shop or field erection, using a hot-applied repair compound applied in accordance with its manufacturer's recommendations as approved by the OWNER/ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Measurement for payment for furnishing and installing chain link fence and gate(s) will include completed installation and proper operation of all components of chain link fence at the Blower/Flare Facility.

4.02 PAYMENT

A. General: Payment constitutes full compensation for furnishing all labor, equipment, materials, and incidentals necessary to provide all construction covered in this Section, in accordance with the Contract Drawings, as specified, and as may otherwise be required.

B. Payment for furnishing and installing chain link fence and gate(s) will be based on the lump sum price quoted in the Bid Schedule for "Chain Link Fence".

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All cast-in-place concrete, including formwork and reinforcement, as shown on the Contract Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 RELATED SECTION

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 02221 - Excavating, Backfilling, Compacting, and Grading
D. Section 11000 - Equipment

1.03 REFERENCES

A. ACI 301 Specifications for Structural Concrete for Buildings
B. ACI 308 Standard Practice for Curing Concrete
C. ACI 318 Building Code Requirements for Reinforced Concrete
D. ASTM A185 Specification for Welded Steel Wire Fabric for Concrete Reinforcement
E. ASTM A615 Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement
F. ASTM C33 Specification for Concrete Aggregates
G. ASTM C39 Test Method for Compressive Strength of Cylindrical Concrete Specimens
H. ASTM C42 Drilled Cores and Sawed Beams of Concrete
I. ASTM C94 Standard Specification for Ready-Mixed Concrete
J. ASTM C143 Test Method for Slump of Portland Cement Concrete
K. ASTM C150 Specification for Portland Cement

1.04 SUBMITTALS

A. Submit 5 copies of the following to the OWNER/ENGINEER for review and approval at least 15 days before intended placement:

1. Concrete mix designs.
2. Materials list of items proposed to be provided under this Section.
3. Manufacturer's specifications and other data needed to prove conformance with the specified requirements.
4. Manufacturer's recommended installation procedures which, when approved by the ENGINEER, will become the basis for accepting or rejecting actual installation procedures used for the Work.

1.05 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

B. Comply with ACI 301, except as may be modified herein.

C. Provide access for, and cooperate with, the inspector and testing laboratory.

D. Do not commence placement of concrete until mix designs have been reviewed and approved by the OWNER/ENGINEER, and all governmental agencies having jurisdiction, and until copies of the approved mix designs are at the Site and the batch plant and the reinforcing steel has been inspected and approved by the inspector and the OWNER/ENGINEER.

E. Four (4) concrete test cylinders will be taken by the CONTRACTOR for every concrete structure or every 250 cubic yards of concrete placed, but not less than one set per day. One of the test cylinders shall be tested at 7 days for 70 percent of design strength, two shall be tested at 28 days for full design strength, and one shall be held until the final acceptance of the project.

PART 2 PRODUCTS

2.01 FORMS

A. Design, erect, support, brace, and maintain formwork so it will safely support vertical and lateral loads which might be applied until such loads can be supported safely by the concrete structure. Forms shall comply with the applicable requirements of Standard Specifications Section 51-1.05.

B. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, locations, grades, and level and plumb work in the finished structure.

2.02 MOISTURE BARRIER

A. Where so indicated on the Contract Drawings, provide a moisture barrier consisting of the following:

1. Four inches of clean dry sand, evenly spread as a cushion,
2. "Visqueen" or equal 6 mil thick plastic sheeting,
3. Two inches of clean dry sand, evenly spread on top of the installed plastic sheeting.

2.03 REINFORCEMENT

A. Reinforcement shall conform to the requirements of Standard Specifications Section 52-1.02A and comply with the following as minimums:

B. Bars: ASTM A615, grade 60 unless otherwise shown on the Contract Drawings, using deformed bars for number 3 and larger.

C. Bending: ACI 318.

D. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI "Manual of Standard Practices."

E. Do not use reinforcement having any of the following defects:

1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances,
2. Bends or kinks not indicated on the Contract Drawings or required for this Work,
3. Bars with cross-section reduced due to excessive rust or other causes.

2.04 CONCRETE

A. Portland cement concrete for structures shall be Class A concrete in conformance with Standard Specifications Section 90 and shall comply with the following as minimums:

B. Portland Cement: ASTM C150, Type II, low alkali.

C. Coarse Aggregate: Uniformly graded, clean, ASTM C33 crushed rock or washed gravel with maximum size between 3/4 inch and 1 1/2 inch, and with a minimum size number 4 sieve.

D. Fine Aggregate: Uniformly graded, clean, ASTM C33 natural washed sand of hard and durable particles varying from fines to particles passing a 3/8 inch screen, of which at least 12 percent shall pass a 50-mesh screen and no more than 3 percent shall pass the number 200 sieve.

E. Water: Clean and potable.

F. Provide concrete with the compressive strengths shown on the Contract Drawings. When such strengths are not shown on the Drawings, provide the following as minimums:

1. Concrete footings	3,000 psi
2. Concrete slabs on grade, walls, and equipment bases	3,000 psi

G. Surface Treatment: Except as otherwise directed by the OWNER/ENGINEER or shown on the Contract Drawings, all newly placed concrete slabs shall be cured with pigmented curing compounds conforming to the requirements of ASTM Designation: C309 Type 2, Class B.

2.05 MINOR CONCRETE

A. Concrete for fence posts, bollards, and other non-structural features shall conform to the requirements for minor concrete in Section 90-10 of the Standard Specifications A.

2.06 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the CONTRACTOR subject to the approval of the OWNER/ENGINEER.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completions of the Work. Do not proceed until unsatisfactory conditions are corrected. Notify the OWNER/ENGINEER of such conditions and proposed corrective action before correcting unsatisfactory conditions.

3.02 REINFORCING

A. Comply with the following, as well as the specified standards, for details and methods of reinforcing placement and supports.

1. Clean reinforcement and remove loose dust and mill scale, earth, and other materials which reduce bond or destroy bond with concrete.
2. Position, support, and secure reinforcement to prevent displacement by forms, construction, and the concrete placement operations.
3. Place reinforcement to obtain the required coverage's for concrete protection, as shown on the drawings.
4. Unless otherwise shown on the Contract Drawings, overlap bars 32 diameters minimum.

3.03 EMBEDDED ITEMS

A. Do not embed piping or conduit in structural concrete.

B. Set bolts, inserts, and other required items in the concrete, accurately secured so they will not be displaced, and in the precise locations needed, as indicated by templates and final equipment shop drawings.

C. Do not cut in-place concrete for retrofit of items not installed through oversight of the CONTRACTOR, except by approval of the OWNER/ENGINEER.

3.04 MIXING CONCRETE

A. Transit mix the concrete in accordance with provisions of Section 90-6 of the Standard Specifications.

B. Slump allowance shall be between 3 and 5 inches as determined using ASTM C143.

C. Supply test cone and all other required materials to perform test.

D. Mix not less than one minute immediately prior to discharge of the batch.

E. Unless otherwise directed provide 15 minutes total mixing time per batch after the first additions of water.

F. Place concrete within 60 minutes after water is first introduced into the mix.

3.05 TESTING

A. The CONTRACTOR will provide strength tests of concrete samples in accordance with ASTM C39. For each day of concrete pouring, prepare a minimum of four concrete sample cylinders to be tested for 7-day and 28-day strength by an accredited laboratory.

B. The CONTRACTOR will prepare standard test cylinders in accordance with ASTM C39.

C. The CONTRACTOR shall submit test results verifying compliance with the specifications to the OWNER/ENGINEER.

D. If any one of the samples fails to meet the specified 28-day minimum ultimate compressive strength, all concrete poured on that day will be assumed to be defective and cores from selected areas may be taken as directed by the OWNER/ENGINEER, and tested in accordance with ASTM C42.

E. If the compressive strength of the concrete cores fails to meet the specified strength test criteria, the in-place concrete will be considered defective and shall be removed or adequately strengthened as directed by the OWNER/ENGINEER.

F. Perform all required additional coring, testing of cores, and repair work pertaining to defective concrete at no additional cost to the OWNER.

3.06 PLACING CONCRETE

A. Preparation:

1. Remove foreign matter accumulated in the forms and footing excavations.
2. Rigidly close openings left in the formwork.
3. Wet wooden form work sufficiently to tighten up cracks; wet other material sufficiently to maintain workability of the concrete.
4. Use only clean tools.
5. Do not place concrete in weather conditions which may be detrimental to the quality of the final product, including:

    a. temperature below 32°F

b. during precipitation
c. in the presence of excessive moisture (fog, dew, mist, etc.)

B. Conveying:

1. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.
2. Deposit concrete in its final location, as practicable, so as to avoid separation due to rehandling and flowing.
3. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or has been contaminated by foreign materials.
4. Remove rejected concrete from the job site.

C. Placing Concrete in Forms:

1. Deposit concrete in horizontal layers not deeper than 24 inches, and avoid inclined construction joints.
2. Remove temporary spreaders in forms when concrete has reached the elevation of the spreaders.

D. Placing Concrete Slabs:

1. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
2. Bring slab surfaces to the correct level and slope with a straight edge, and then strike off.
3. Use bullfloats or darbies to smooth the surface, leaving the surface free from bumps and hollows.
4. Do not sprinkle water on the plastic surface. Do not disturb the slab surface prior to start of finishing operations.

3.07 CONSOLIDATION

A. Consolidate each layer of concrete immediately after placing, by use of internal concrete vibrators supplemented by hand spading, rodding, or tamping.

B. Do not vibrate forms or reinforcement.

C. Do not use vibrators to transport concrete inside the forms.

3.08 JOINTS

A. Construction Joints:

1. Do not use horizontal construction joints except as may be shown on the Contract Drawings.
2. If additional construction joints are found to be required, secure the OWNER/ENGINEER's approval of joint design and location prior to start of concrete placement.

B. Expansion Joints:

1. Do not permit reinforcement or other embedded metal items that are being bonded with concrete to extend continuously through any expansion joint.
2. Fill expansion joints full depth with expansion joint material approved by the OWNER/ENGINEER.

3.09 CONCRETE FINISHING

A. Except as may be shown otherwise on the Contract Drawings, provide the following finishes at the indicated locations:

1. Class I Trowel Finish: Apply to exposed vertical surfaces above finished ground and to at least 1 foot below finished ground.
2. Non-slip Broom Finish: Apply to horizontal surfaces of slabs and bases.

B. Finished work shall contact a 10 foot straight edge in any direction with a 1/8-inch maximum tolerance.

C. Provide finished concrete surfaces conforming to the following tolerances:

1. Maximum Variation from Plumb in all Vertical Lines and Surfaces: 1/4 inch in 10 feet.
2. Maximum Variation from Level or Grades Indicated: 1/4 inch in 10 feet.
3. Maximum Variation in Cross-Sectional Dimensions and Slab Thickness: minus 1/4 inch, plus 1/4 inch.

3.10 CURING

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure surfaces in accordance with ACI 308.

D. Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 4 days minimum.

E. Spraying: Spray water over floor slab areas and maintain wet for 7 days minimum.

3.11 REPAIR

A. Repair or replace deficient or damaged work as directed by the OWNER/ENGINEER and at no additional cost to the OWNER.

3.12 PROTECTION

A. Protect all concrete pours from damage or premature loading prior to complete curing of the concrete.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Measurement for payment for constructing concrete slabs, walls, foundations, and appurtenant work will be by the lump sum, complete in place.

4.02 PAYMENT

A. Payment constitutes full compensation for furnishing all labor, materials, equipment, tools, and accessories including reinforcing steel, inserts, anchor bolts, concrete masonry units, water stops, cement, admixtures if used, fine and coarse aggregates, formwork, and for performing all work as indicated on the Drawings, as specified in these Specifications, and may otherwise be required.

B. Payment for construction of cast-in-place concrete or concrete masonry units shall be based on the lump sum prices quoted in the Bid Schedule.

END OF SECTION

SECTION 09910
PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Painting and finishing exposed surfaces using the combination of materials, as specified herein, and as needed for a complete and proper installation.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 - Product Options and Substitutions
D. Section 11000 - Equipment
E. Section 15480 - Piping
F. Section 16050 - Basic Electrical Requirements

1.03 WORK INCLUDED

A. Paint structures, piping, machinery, and equipment as specified herein, and as needed for a complete and proper installation including:

B. General:

1. All exterior galvanized and ungalvanized ferrous metal work.
2. Finish painting on all primed and un-primed metal.
3. All landfill gas wellheads, as shown in the Contract Drawings.
4. All exposed non-UV rated PVC piping, conduits and fittings.

C. Machinery and Equipment: All equipment, motors, pipes, electric cabinets, and other mechanical and electrical equipment, not provided with factory finish for exterior applications.

D. When equipment or materials will be painted prior to delivery to the site, specifications for painting should be provided to the equipment and material suppliers as required.

E. Painting shall be completed in accordance with all applicable federal, state and local regulations, codes and ordinances.

1.04 WORK NOT INCLUDED

A. Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas.

B. Surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require painting unless otherwise indicated.

C. Do not paint Teflon® or HDPE pipe or tubing unless otherwise indicated.

D. Do not paint flexible rubber couplings or cuffs, unless otherwise indicated.

E. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts, unless otherwise indicated.

F. Do not paint over labels or equipment identification, performance rating, name, or nomenclature plates.

G. Do not paint concrete.

1.05 DEFINITIONS

A. "Paint," as used herein, means coating system materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.06 SUBMITTALS

A. Product Data: Within 15 calendar days after the CONTRACTOR has received the OWNER's Notice to Proceed, submit 5 copies of:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements.

B. Samples:

1. Following the selection of colors and glosses by the OWNER/ENGINEER, submit Samples for the OWNER's/ENGINEER's review.

a. Provide one sample of each color and each gloss for each material on which the finish is specified to be applied.
b. Except as otherwise directed by the OWNER/ENGINEER, make samples approximately 8 inches x 10 inches in size.
c. If so directed by the OWNER/ENGINEER, submit samples during progress of the work in the form of actual application of the approved materials on actual surfaces to be painted.

2. Revise and resubmit each sample as requested until the required gloss, color, and texture is achieved. Such samples, when approved, will become standards of color and finish for accepting or rejecting the work of this Section.
3. Do not commence finish painting until approved samples are on file at the job site.

1.07 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. All phases of the work shall be available to observation by a representative of the coating manufacturer and the OWNER/ENGINEER.

C. Paint Coordination:

1. Provide finish coats which are compatible with the prime coats actually used.
2. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the various substrata.
3. Upon request, furnish information on the characteristics of the specific finish materials to assure that compatible prime coats are used.
4. Provide barrier coats over incompatible primers, or remove the primer and reprime as required.
5. Notify the OWNER/ENGINEER in writing of anticipated problems in using the specified coating systems over prime-coatings supplied under other Sections.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver all paint materials to the job-site in their original, unopened containers, with all labels intact and legible at the time of use.

B. When materials are not in use, store in tightly covered containers.

C. Maintain containers used in storage, mixing, and application of paint in a clean condition, free from foreign materials and residue.

1.09 SITE CONDITIONS

A. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45°F, unless otherwise permitted by the manufacturers' printed instructions as approved by the OWNER/ENGINEER.

B. Weather Conditions:

1. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces, unless otherwise permitted by the manufacturers' printed instructions as approved by the OWNER/ENGINEER.
2. Applications may be continued during inclement weather only within the site and weather conditions and the temperature limits specified by the paint manufacturer as being suitable for use during application and drying periods.

1.10 MAINTENANCE

A. Upon completion of the work of this Section, deliver to the OWNER an extra stock equaling 10 percent of each color, type, and gloss of paint used in the work, in tightly sealed containers, and clearly labeled with contents and location where used.

PART 2 PRODUCTS

2.01 PAINT MATERIALS

A. Acceptable Materials:

1. The Painting Schedule in this Section is based, in general, on products of the Sinclair Paint Company.
2. Equal products of other manufacturers approved in advance by the OWNER/ENGINEER may be substituted in accordance with provisions of the Contract.
3. Where products are proposed other than those specified by name and number in the Painting Schedule, provide a new painting schedule compiled in the same format used for the Painting Schedule included in this Section.

B. Undercoats and Thinners:

1. Provide undercoat paint produced by the same manufacturer as the finish coat.
2. Use only the thinners recommended by the paint manufacturer, and use only to the recommended limits.
3. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of a unified system of paint finish.

2.02 COLOR SCHEDULES

A. The OWNER/ENGINEER will prepare a color schedule for guidance in painting.

2.03 APPLICATION EQUIPMENT

A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the OWNER/ENGINEER.

B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

2.04 OTHER MATERIALS

A. Provide other materials, not specifically described, but required for a complete and proper installation, as selected by the CONTRACTOR subject to the approval of the OWNER/ENGINEER.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected. Notify the OWNER/ENGINEER of such conditions and proposed corrective action before correcting unsatisfactory conditions.

3.02 PREPARATION

A. Paint:

1. Mix and prepare paint materials in strict accordance with the manufacturers' recommendations as approved by the OWNER/ENGINEER.
2. Stir materials before application, producing a mixture of uniform density and color.
3. Do not stir into the material any film which may form on the surface, but remove the film and, if necessary, strain the material before using.

B. Surface:

1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers' recommendations and as approved by the OWNER/ENGINEER.
2. Remove removable items which are in place and are not scheduled to receive paint finish; or provide surface-applied protection prior to surface preparation and painting operations.
3. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.
4. Clean each surface to be painted prior to applying paint or surface treatment.
5. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200°F, prior to start of mechanical cleaning. Neutralize or flush off any chemical contamination prior to any other surface preparation. All "flush off" water will be collected and disposed of by and at the expense of the CONTRACTOR in a suitable manner approved by the OWNER/ENGINEER.
6. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet, newly painted surfaces.

C. Plastic Surfaces: Clean surfaces until free from dirt, oil, and other foreign substance.

D. Metal Surfaces:

1. Remove all weld splatter and grind all rough edges and rough welds smooth.
2. Thoroughly clean surfaces until free from dirt, oil, and grease.
3. On galvanized surfaces, use solvent for the initial cleaning, and then treat the surface thoroughly with phosphoric acid etch. Remove etching solution completely before proceeding.
4. Allow to dry thoroughly before application of paint.

3.03 APPLICATION

A. General:

1. Apply all paint in strict compliance with the paint manufacturer's recommendations for a specific surface and each successive paint coat, not exceeding the mil thickness specified by the manufacturer.
2. Coordinate work so that factory primed items are primed or painted with a coating compatible with the specified painting system.
3. Touchup shop-applied prime coats which have been damaged, and touchup bare areas prior to start of finish coats application.
4. Slightly vary the color of succeeding coats.

    a. Do not apply additional coats until the completed coat has been inspected and approved.
    b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.

5. Sand and dust between coats to remove defects visible to the unaided eye from a distance of 5 feet.
6. On removable panels and hinged panels, paint the back sides to match the exposed sides.

B. Drying:

1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.
2. Consider oil-base and oleo-resinous solvent-type paint as dry for recoating when the paint feels firm, does not deform or feel sticky under moderate pressure of the thumb, and when the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Brush Applications:

1. Brush out and work the brush coats onto the surface in an even film.
2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.

D. Spray Application:

1. Except as specifically otherwise approved by the OWNER/ENGINEER, spray paint plastic pipe surfaces and similar surfaces where hand brush work would be inferior.
2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
3. Do not double back with spray equipment to build up film thickness of two coats in one pass.

E. For completed work, match the approved samples as to texture, color, and coverage. Remove, refinish, or repaint work not in compliance with the specified requirements.

3.04 CLEANING UP

A. Do not allow the accumulation of empty containers or other excess items except in areas specifically set aside for that purpose.

B. Prevent accidental spilling of paint materials and in the event of such a spill, immediately remove all spilled material and the waste or other equipment used to clean up the spill, and wash the surfaces to their original undamaged condition, all at no added cost to the OWNER.

C. Upon completion of this portion of the work, visually inspect all surfaces and remove all paint and traces of paint from surfaces not schedule to be painted.

3.05 PAINTING SCHEDULE

A. Provide the Following Paint Finishes:

1. Exterior Metal, Ferrous (Excluding the flare):

   a. First Coat: Chrome oxide primer #15
   b. Second Coat: Sash and trim primer #248
   c. Third Coat: Stuc-O-Life #1300

2. Exterior Metal, Galvanized:

   a. Pretreatment: Vinyl wash primer #7113
   b. First Coat: Zinc dust primer #25
   c. Second Coat: Sash and trim primer #248
   d. Third Coat: Stuc-O-Life #1300

3. PVC Pipe and Fittings:

   a. First Coat: White primer #28N
   b. Second Coat: Sash and trim primer #248N
   c. Third Coat: Stuc-O-Life #1300

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable item in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 11000
EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide and install all landfill gas control system equipment shown on the Contract Drawings as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to, the following:

1. Landfill gas control system equipment including:

a. Landfill gas handling and flare skid and accessories, including 2 blowers, enclosed flare, condensate knockout pot, and motor control center
b. Propane tank and fuel piping

2. Condensate collection system equipment including:

a. Condensate sump pump systems
b. Vertical condensate storage tank
c. Condensate flare injection system

3. Compressed air supply system including

a. Rotary screw air compressor and receiver
b. Refrigerated air dryer
c. Coalescing filter
d. Particulate filters

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 - Product Options and Substitutions
D. Section 01720 - Project Record Documents
E. Section 01730 - Installation, Operation, and Maintenance Instructions
F. Section 02221 - Excavating, Backfilling, Compacting, and Grading
G. Section 03300 - Cast-In-Place Concrete
H. Section 09910 - Painting
I. Section 15480 - Piping
J. Section 16050 - Basic Electrical Requirements
K. Section 16100 - Basic Electrical Materials and Methods
L. Section 16910 - Control Panels

1.03 REFERENCES

(Not Used)

1.04 SYSTEM DESCRIPTION

A. The design of the landfill gas control system will consist of extracting the landfill gas generated in the landfill by vacuum. The landfill gas will be drawn from an array of landfill gas extraction wells and conveyed through a

collection piping system by vacuum supplied by centrifugal blowers, to an enclosed flare, where the landfill gas will be combusted and the exhaust released to the atmosphere.

B. The blower/flare system shall be provided with an industry standard computer-based control system as the primary operating mode, including all monitoring and control features, as specified. In addition, the blower/flare system shall be provided with a back-up operating mode to provide the minimal essential monitoring and control features required to safely operate the flare in case of computer system failures. The back-up control system shall utilize basic contactor/relay technology, and parallel connections to the same monitoring instrumentation required by the computer based system.

C. The condensate generated by the cooling of the landfill gas in the collection piping system will be gravity drained into condensate sumps located around the landfill and at the blower/flare facility and then pumped into a 1,100 gallon vertical condensate storage tank. Level controls installed within the condensate storage tank will activate and deactivate a condensate injection system that will pump the condensate from the storage tank through an air-assisted spray nozzle, into the enclosed flare for disposal.

D. The landfill gas control system shall conform with all applicable regulatory requirements.

1.05 SUBMITTALS

A. Product Data: Within 30 calendar days after the CONTRACTOR has received the OWNER's Notice to Proceed, submit 5 copies of:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommended installation instructions which, when approved by the OWNER/ENGINEER, will become the basis for accepting or rejecting actual installation procedures used on the work.
4. Manufacturer submittal of three (3) reference sites where the proposed condensate injection system has been successfully installed, has met regulatory acceptance criteria, and has successfully operated over a 2-year period.
5. Manufacturer submittal of three (3) reference sites where the performance test results for the proposed enclosed flare system would meet the requirements of the San Joaquin Valley Unified Air Pollution Control District Authority to Construct / Permit to Operate. A minimum of one flare performance test must be of the same capacity range, and must include emissions monitoring results during condensate injection operation.

B. Shop Drawing: Within 30 calendar days after the CONTRACTOR has received the OWNER's Notice to Proceed, submit Shop Drawings in sufficient detail showing the fabrication, installation, anchoring, and interfacing the work of this Section with the work of other sections.

C. Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the OWNER three complete operation and maintenance manuals and as-constructed Record Drawings as specified in Section 01720.

1.06 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Regulatory Requirements:

1. Without additional cost to the OWNER, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

2. In addition to complying with the specified requirements, comply with pertinent regulations of governmental agencies having jurisdiction.
3. In the event of conflict between or among specified requirements and pertinent regulations, the more stringent requirements will govern unless otherwise approved by the OWNER/ENGINEER.

C. In addition to complying with the specified requirements, comply with the directions of the OWNER/ENGINEER.

1.07 DELIVERY, STORAGE AND HANDLING

A. Acceptance at Site

1. The CONTRACTOR will be responsible for coordination of delivery, unloading, placement, hook-up, and construction of all necessary appurtenances.
2. Materials and equipment provided shall be new, except as may be indicated herein and on the Contract Drawings.
3. Loading, transporting, unloading, and storage of all materials and equipment shall be conducted such that they are kept clean and free from damage.
4. The CONTRACTOR shall submit certification of compliance for materials and equipment used to complete the work in this Section. Certificates shall be signed by an authorized representative of the producer or manufacturer and shall state that the equipment or material complies in all respects with the Specifications. In the case of multiple shipments, each shipment shall be accompanied by a certificate of compliance.
5. Materials and equipment used may be sampled and tested at any time. The fact that material or equipment is used on the basis of a certificate of compliance shall not relieve the CONTRACTOR of responsibility for incorporating material or equipment in the work which conforms to the requirements of the contract and any such material or equipment not conforming to such requirements will be subject to rejection by the OWNER/ENGINEER, whether in place or not.
6. The OWNER/ENGINEER reserves the right to refuse to permit the use of certain materials or equipment.

B. Storage and Protection

1. Provide sheltered, weathertight, or heated weathertight storage as required for materials and equipment subject to weather damage.
2. Provide blocking, platforms, or skids for materials and equipment subject to damage by contact with the ground.
3. Store packaged materials and equipment in their original, unbroken package or container.

1.08 WARRANTY

A. CONTRACTOR will provide a one-year warranty on all materials, equipment, and labor furnished for all work performed. Warranty period begins upon final payment made by Owner for this contract.

1.09 SYSTEM STARTUP

A. The CONTRACTOR is required to coordinate and pay the costs for the LFG equipment manufacturer to be on site for three days to start the equipment, provide a system shakedown, verify that the system is properly installed, and provide a brief training session for the OWNER/ENGINEER. The OWNER/ENGINEER should be notified 15 days prior to the intended start-up of the equipment.

1.10 MAINTENANCE

A. CONTRACTOR will be required to be available for two weeks after the initial system startup of the landfill gas control system to make any necessary adjustments, repairs, or maintenance for proper system operation at no cost to the OWNER/ENGINEER.

PART 2 PRODUCTS

2.01 CENTRIFUGAL GAS BLOWERS

A. General

1. Provide two (2) identically sized centrifugal blowers, Lamson, Hoffman, or ENGINEER approved equal. The blowers shall be belt-driven, self-lubricating, complete with blower, electric motor, belts and pulleys, belt guard, equipment base and vibration isolation pads.
2. All blower components shall be designed or selected and provided by the blower manufacturer. Blower model selection shall be confirmed by the manufacturer for the performance requirements below, and approved by the OWNER/ENGINEER.
3. All blower components shall be assembled and aligned on a common steel equipment base to provide a vibration-free operating blower.
4. All components of the equipment base shall be coated with rust prohibiting primer and finished with a 3-mil thick coat of industrial enamel paint.
5. Vibration isolation pads to be placed between the equipment base and the concrete foundation base shall be designed or selected and provided by the blower manufacturer to provide a vibration free operating blower.
6. The blower assembly shall be factory mounted on a steel skid and delivered to the site as a complete unit.
7. The motor and blower housings shall each be provided with a nameplate which states the manufacturer, model number, serial number, and the pertinent information regarding electrical requirements, size, capacity, etc.
8. Install the blower assembly in compliance with the manufacturer's recommendations, the applicable codes, the Contract Drawings, and as specified herein.

B. Specific performance and construction requirements shall be as follows:

1. Gas pumped	Landfill gas
2. Gas composition,	
% methane (CH_4) range	20 to 60
carbon dioxide (CO_2) range	Remainder
3. Gas density, average, lb/ft^3	0.074
4. Gas relative humidity, %	100
5. Elevation above MSL, ft	253
6. LFG flow rate, scfm	800 (each blower)
7. Inlet vacuum at condensate knock-out inlet, inches of W.C.	-55, at max. flow rate
8. Discharge pressure at inlet to flame arrestor, inches of W.C.	as per flare manufacturer at max. flow rate (min. –12)
9. Blower speed, rpm	3,500
10. Motor size, hp	as per blower manufacturer
11. Motor speed, rpm	3,500
12. Motor type	AC Squirrel cage induction
13. Motor enclosure	TEFC
14. NEMA design	B
15. Insulation class	B
16. Voltage, Phases, Cycles	240-480/3/60
17. Service factor	1.15

18. Provide inlet driven blower with outboard mounted bearings.
19. Inlet connection: vertical (position 1), flanged, ASA 125-pound drilled.
20 Outlet connection: horizontal (position 2), flanged, ASA 125-pound drilled. Outlet shall be directed to the right as viewed from the driven side of the blower.
21. Provide the number of impeller stages and impeller vane design (backward and/or straight bladed) as required for best efficiency performance and without surging.
22. Blower housing inlet head, outlet head and intermediate sections shall be cast iron, and internally coated with factory baked-epoxy process.
23. Blower impeller shall be cast or fabricated aluminum alloy of impeller vane design indicated above.
24. Provide labyrinth seals between impeller stages and at the outlet head.
25. Provide mechanical or labyrinth shaft seal on drive end of shaft.
26. Provide grease lubrication with constant level greasers on outboard bearings.
27. Shaft and impeller assembly shall be dynamically balanced to provide a vibration free operating blower.
28. Provide a certified report for the blower indicating the dynamic balancing results.
29. Provide a 3/8-inch NPT drain connection with plug at the bottom of the impeller housing.
30. Provide bearings adequately sized and selected for a minimum 10-year life under specified performance requirements.
31. Provide ammeter and surge protection controls, and motor vibration switches for each blower. Controls shall be designed or selected and provided by the blower manufacturer for the surge range of the blower specified in this section. Controls shall shut down (after an adjustable time period) the blower when its flow rate falls into the surge range. Surge protection controls shall include an auxiliary set of contacts (one NO and one NC) for a remote alarm circuit, and a reset for restart of the blower. Surge controls requiring re-circulation of landfill gas are not acceptable. Control components for the blower shall be installed in the Motor Control Center (MCC) either in or near the cubicle that contains the respective motor controls.

C. Miscellaneous:

1. Manual isolation butterfly valves shall be installed at the blower inlet and outlet for each blower.
2. Expansion joints shall be provided at the inlet and outlet connections for each blower.
3. Check valves shall be provided at the outlet for each blower.
6. Pressure gauges shall be provided for each blower outlet.
7. Skid LFG piping shall be sized such that total of LFG pipe friction losses on blower skid shall not exceed 5 percent of blower pressure capacity at maximum design flow.

2.02 LANDFILL GAS FLARE

A. General:

1. Provide one (1) enclosed landfill gas flare, as manufactured by LFG Specialties, Inc. (949) 660-5476, John Zink Company (918-234-1800), Callidus Technologies (918-496-7599), or approved equal, designed for condensate injection and destruction.
    a. Manufacturer shall submit reference documentation supporting successful performance of similar installations, for approval of the OWNER/ENGINEER as specified in paragraph 1.05 Submittals.
2. The landfill gas flare shall meet all requirements of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD), and all applicable provisions of Rule 4642, including:
    b. Flare shall achieve a VOC destruction efficiency of at least 98 percent by weight, or reduce the VOC concentration to 20 ppmv or less, (measured as methane and corrected to 3 percent oxygen).
    c. The flare manufacturer shall provide (for approval by the SJVUAPCD) a written guarantee and supporting data to demonstrate this VOC destruction efficiency.
    d. Flare shall simultaneously meet the applicable operational requirements of Rule 4642, 40 CFR 60.756(b), and 40 CFR 60.18, and a NOx limit of 0.05 pounds per million Btu, as demonstrated by independent, third-party, source emissions testing.

b. Flare shall be equipped with a circular exhaust stack, and test ports and provisions for source testing at locations required by regulations.
c. Flare station shall be equipped with control and monitoring equipment, which includes an optical flame detector, stack thermocouple, flame arrestor, and automatic shut off valve.
d. The automatic valve shall activate safe shut-off under all routine and non-routine shutdown conditions.
e. The flare shall include instrumentation to continuously measure and display the LFG flare inlet flow rate (scfm) and the flare exhaust gas temperature (°F).

3. Final flare design and construction shall not commence until shop drawings have been reviewed and approved by the OWNER/ENGINEER and the SJVUAPCD, and an Authority to Construct Permit issued by the SJVUAPCD. The Authority to Construct Permit will be obtained by the OWNER.
4. The flare shall be constructed and delivered to the site, ready for installation. All components shall be designed, fabricated, and assembled in accordance with best engineering and shop practices. Individual parts shall be manufactured in standard sizes. Equipment shall not have been in service except for shop tests prior to delivery.
5. All mechanisms and parts shall be amply proportioned for stresses which may occur during fabrication, delivery, erection, and operation. Individual parts which are alike in the unit shall be alike in workmanship and design and shall be interchangeable. All materials shall be suitable for the service conditions.
6. Materials and construction shall be in compliance with applicable requirements of the standards of ASME, AGA, NFPA, and the UL. Welding shall meet AWS standards. General fabrication shall be in compliance with the latest standard of AISC. All ratings shall be certified by the manufacturer and shall, at minimum, be equal to the requirements and conditions specified herein.
7. Flare manufacturer shall provide a guarantee for the flare emissions. Flare performance shall be in compliance with the requirements, conditions and specifications of the SJVUAPCD permit. All work and materials (including that provided by third parties) required to correct problems arising from non-compliance with specifications or emission standards, shall be performed and provided by the flare manufacturer at no expense to the OWNER.
8. Flare manufacturer shall provide the final flare anchor bolt schedule and design to CONTRACTOR prior to flare foundation construction.

B. Construction: Specific Construction Requirements and Features, shall include the following:

1. Flare stack:

a. Flare shell, ¼-inch, steel (A-36 or better) welded construction, self-supporting base plate with support gussets, welded to the skid assembly.
b. Ceramic fiber refractory lining in combustion chamber and stack, 2-inch-thick minimum, A.P. Green Inswool (or equal) on Inconel pins and keepers.
c. Combustion air control dampers, two (2) automatically operable and one (1) manually operable, located at or below the combustion zone. If an additional damper is required, it shall be automatically operable.
d. Sight ports to view main and pilot flame.
e. Three (3) ports for thermocouples (number and flare stack elevation to be determined by flare manufacturer), to allow stack temperature monitoring at multiple elevations, based on variations in LFG flow rate.
f. Two (2) ports for ultraviolet flame scanner to monitor both the pilot and main flame. In addition, provide an additional 2" port and flame scanner to provide backup monitoring of the main flame.
g. Four (4) ports for sampling of stack gases. Size and location as required by the SJVUAPCD.
h. External, expanded metal heat shield for personnel protection between the elevations of 2 and 6 feet from bottom of flare.
i. Lifting lugs at the top of the stack for ease of installation.
j. Ports for condensate injection equipment, including condensate injection gun.
k. 304 stainless steel plate retainer around all open edges of the insulation refractory blanket.
l. Ports for condensate injection equipment, including condensate injection gun.

m. Flare Access Port: Provide flare with lockable or boltable access way into the flare base, at burner elevation.
n. Port for future leachate vapor inlet.
o. Thermocouple access ladder, with back-guard and lockable entrance door.

2. Main fuel burner system:

   a. Stainless steel, center burner tip flange with burner arms connected to center burner tip suitable to burn the specified fuel at specified inlet flow rate range and pressure without exceeding specified stack emissions.
   b. Burner orifices shall be no smaller than 3/8-inch diameter.
   c. Gas inlet pipe connection, flanged, terminating outside the flare.
   d. All internal gas piping between burner and gas inlet pipe flange.
   e. Purge air blower with pressure-proving switch to evacuate gases remaining in flare stack prior to ignition cycle.

3. Flare finish:

   a. Commercial sandblasting.
   b. Exterior coat, Sherwin Williams "Zinc Clad I", (or equal) inorganic zinc, 2 to 3 mils minimum.

4. Ignition system, rack mounted:

   a. Spark ignitor assembly, including stainless steel pilot tip, ceramic insulator(s) and support bracket(s) for automatic ignition of pilot flame.
   b. Ignition transformer.
   c. Conduit and wiring between ignitor and transformer.
   d. NEMA 4 cabinet to house the transformer and the temperature controller.
   e. Thermocouple to confirm pilot flame.
   f. Ignition timer.

5. Pilot gas system, rack mounted:

   a. Pilot gas burner assembly, suitable for propane gas.
   b. Solenoid valve, normally closed, explosion proof, 115 volt.
   c. Shut-off valve.
   d. Pressure regulator with pressure gauge.
   e. Piping between burner assembly and inlet to the regulator.
   f. Pilot timer and pilot failure indicator.

6. Flame scanner: Ultraviolet-sensing scanner(s) compatible with Flame-Trol IV automatic flare controller, or ENGINEER approved equal, to provide flame confirmation and initiate automatic start-up and shutdown of the blower, flare, and auto-valve upon loss of flame.

7. Stack gas temperature control and flare station monitoring system, including:

   a. A primary flare control system consisting of a Flame Safety System for flame management and a programmable logic controller (PLC) for monitoring and control of all other flare and blower operating parameters.
   b. A secondary flare control system, with only essential functions providing the ability for temporary operator bypass of the computer controlled operations, using basic contactor/relay technology and common instrumentation and controllers. As a minimum, operation in this mode shall provide flame safety and high temperature monitoring and shut-down functions.
   c. The PLC shall include a human machine interface (HMI) device mounted in the face of the control cabinet, for local operator interaction with the flare control system. The flare control system shall also

include an IBM-compatible host personal computer (PC) running a supervisory control and data acquisition (SCADA) software program, to permit remote monitoring and control via telephone lines and electronic data logging of flare operating parameters, including time, flow, condensate levels, and flare operating temperature. The PLC shall be supplied with two serial communication ports to accommodate simultaneous connection to both the local HMI, as well as the host PC. All system controllers shall be Year 2000 compliant.

d. The PLC and SCADA shall be capable of automatically starting and shutting-down the flare system at user programmed intervals to allow periodic or timed operation of the flare. The allowable start and shut-down times shall be in minimum increments of tenths of an hour and allow for at least two start and shut-down cycles per day. The flare system clock/timer shall be adjustable using the both the HMI and the host PC.

e. Control systems shall be mounted in NEMA 4 cabinets, fully piped and wired. Cabinets shall be completely wired and provided with the necessary terminals for external wiring. Cabinets shall be free-standing, mounted to the electrical control rack on the LFG handling skid at eye level. Cabinet doors shall be provided with windows for viewing the chart recorder and the digital displays of the instruments. Cabinet windows shall be provided with a shield or screening, to block UV or direct sunlight from impacting the internal components or chart paper.

d. A flare stack gas temperature/combustion air flow control system consisting of the PLC-integrated temperature control program, a primary dual thermocouple/thermo well near the exit of the flare, two back-up thermocouple locations at lower elevations to be approved by the OWNER/ENGINEER, conduit and wiring between the thermocouples and the controller, electrically operated air damper motor(s), air damper control linkage, and the air dampers. The control system shall be designed to accept input from any of the three possible thermocouple locations and shall automatically adjust the combustion air flow rate to maintain the flare stack gases at a constant temperature, adjustable between 1200 and 2000°F. Damper(s) shall open fully on flare shut down.

e. A stack gas temperature and landfill gas flow rate recorder, Honeywell, Yokogawa, or ENGINEER approved equal. Recorder shall be micro-processor based, with plain paper print out, digital landfill gas flow rate and flare temperature display, digital and analog input channels and optional RS 422 port to support a bi-directional communication link between the recorder and the host PC. Recorder shall be designed to accept input from any one of the primary thermocouples, and be capable of recording temperatures between 0 and 2500°F and flows between 0 and 300 scfm.

f. A high stack combustion temperature shut-down system, including the PLC-integrated temperature monitoring program, a dedicated thermocouple/thermowell at location of maximum flare temperature, and conduit and wiring between the thermocouple and the controller. The controller shall be designed to accept input from the thermocouple and shall provide necessary outputs to open (or close) control circuits to shut down the flare on high stack gas temperature conditions. High temperature set point shall be adjustable between 1200 and 2000°F, with manual reset, after exceedance.

g. All monitoring sensors and transmitters shall be installed within weatherproof enclosures.

h. Provide an alarm monitoring panel, Chatterbox CB-8 or approved equal, to allow automatic telephone communication of up to eight alarm signals to a remote alarm monitoring company. Provide connections to relay dry contacts in blower, condensate, and flare controls, as shown in the equipment manufacturer's shop drawings. Coordinate with OWNER's to initiate continuous alarm monitoring, notification, and dispatch service upon start up of continuous operation of LFG control system.

8. Provide one (1) horizontal flame arrestor with aluminum housing and internals, Varec Model 5010 or approved equal.

9. Flare Inlet Valve: Provide one (1) wafer type, manual butterfly valve with Viton seat and seals, Asahi-America, +GF+, or ENGINEER approved equal, complete with gear-operated handle. Provide spacers as needed to ensure complete operation of the valve without interference with the LFG piping.

10. Fail Close Valve:

a. Provide one (1) auto-actuated butterfly valve, Grinnell, or ENGINEER approved equal, bubble-tight, wafer-style, carbon steel body, with Viton seat and seals.
b. Valve shall be equipped with a pneumatic actuator and separate compressed air supply (small utility air compressor) suitable for exterior installation.

11. Provide one (1) thermal mass flow meter for monitoring and recording of landfill gas volume flow rates, appropriate for continuous use in corrosive and flammable atmospheres. All components to be industrial grade, in NEMA 4 enclosures. Flow element shall be of the thermal anemometer type, Thermal Instruments, Fluid Components International, or approved equal. The flow meter shall be calibrated at the factory for the specific flow range, pipe size, and specified landfill gas composition in these specifications, and calibration parameters shall be approved by the OWNER/ENGINEER before installation.

12. Condensate injection system, including:

a. One (1) condensate injection gun, stainless steel or cast alloy construction.
b. One (1) condensate injection pump designed to pump condensate at a flow rate of 0.5 to 1.0 gallon per minute (gpm) at 50 to 75 psi pressure through the piping and valves to the condensate injection gun at the flare.
c. Switches/sensors for condensate storage level control and injection process control, including high level flare shut down, high level alarm, high level pump start, and low level pump shut-down. The storage level controls will be connected to the blower/flare control panel, to provide high level system shut-down and alarm transmission.
d. Condensate basket strainer, filter, control valve, flow meter, air and liquid pressure sensors and gauges, and stainless steel piping, factory-assembled and ready for operation.
g. A condensate flow sensor and totalizer.

C. Criteria: Specific Flare Design Criteria and Performance Requirements shall be as follows:

1.	Fuel to be burned	Landfill gas
2.	Fuel flow rate range, scfm	200 to 1200
3.	Fuel composition range, percent	
	CH_4	35 to 55
	CO_2	Remainder
4.	High Heating Value (HHV), Btu/SCF	550
5.	Fuel temperature range, degrees Fahrenheit	Ambient to 120
6.	Overall total nonmethane organic compounds combustion destruction efficiency	98 percent, or to less than 20 ppmv (max) measured at the outlet
7.	Stack emissions guaranteed not to exceed at 1600°F	
	a. CO	0.20 pounds/MM Btu
	b. NO_x	0.05 pounds/MM Btu
	c. Nonmethane Organic Compounds	20 ppmv
8.	Stack gas temperature, degrees Fahrenheit, at thermocouple, minimum ½ diameter below flare top	1,450 – 1,600
9.	Stack gas residence time, seconds at thermocouple, minimum ½ diameter below flare top	0.6
10.	Burner noise not to exceed, db	90
11.	Maximum flame-to-shell height ratio, percent	<85

12. Flare structural design

a.	Design code	AISC
b.	Welding code	AWS
c.	Earthquake Zone	*
d.	Wind load	*

* Uniform Building Code latest Edition

13.	Pilot gas propane consumption not to exceed	60,000 Btu/hr at 15 psig
14.	Flare dimensions diameter x height, approximate	Per flare manufacturer recommendations
15.	Burner inlet pipe size	8-inch, minimum
16.	Flame arrestor	
a.	Size	8-inch, flanged, per manufacturer recommendations
b.	Pressure drop across clean element at maximum flow rate, not to exceed, inches of W.C.	1 inch

2.03 CONDENSATE KNOCKOUT POT (KOP)

A. A 36 in. diameter x 60 in. OAH knock-out pot (KOP) with 150-pound flanged inlet connections. KOP to have:

1. Vacuum gauge on the inlet header to the KOP.
2. A heavy-duty liquid level sight gauge to indicate water level within KOP.
3. Stainless steel demister pad with a 98% filtration efficiency of free liquid and solid particles of 20 micron or larger.
4. Internal coating of hi-build vinyl to resist acidic condensate.
5. External finish with rust resistant primer and industrial enamel color coat.
6. Removable lid to facilitate inspection and repair of internal coating and mist pad, as required.
7. 2-inch drain connection with manual ball valve.
8. Differential pressure gauge complete with isolation valves.

2.04 CONDENSATE COLLECTION SUMP

A. General

1. Provide condensate sump and pump assemblies, as shown on the Contract Drawings.
2. Each assembly shall be fabricated from HDPE pipe and fittings, and include a liquid reservoir section, submersible pneumatic pulse-type pump, pressure hose connections to the landfill gas piping, air piping, and condensate discharge piping, including the necessary valves and appurtenances.
3. The sumps shall collect and automatically pump condensate draining by gravity from the following locations, where applicable:

   a. landfill gas piping
   b. compressor receiver
   c. condensate knock-out pot
   d. blower casing drains
   e. flame arrestor drain
   f. sump vault interior drain

B. Specific performance and construction requirements shall be as follows:

1. The pneumatically powered pump shall be Clean Environment Equipment AP-4 (800-877-1772), QED Hammerhead, or ENGINEER approved equal, designed to pump condensate at a maximum flow rate of 8 gpm at a maximum lift of 200 feet, when supplied with 80 to 125 psig compressed air. Pump shall be "controllerless", bottom-loading, with stainless steel body and actuating parts.
2. Each sump shall include a casing seal/well-cap, an air inlet shut off ball-valve, air pressure gauge, air filter/pressure regulator, and pulse cycle counter. The air relay shall provide maximum air flow to the pump and be activated by an air signal from the internal float level controller.
3. The condensate discharge piping in the sump encasement shall include a check valve and discharge shut off ball valve.
4. All materials in contact with the landfill gas, the condensate, the compressed air, and the landfill environment shall be designed to provide corrosion resistance for the intended service. Hose connections from the air supply and condensate discharge pipes to the pumps shall be as recommended by the pump manufacturer for the fluids, pressure, and flows to be conveyed. Hose ends shall be stainless steel quick connects, to facilitate removal for maintenance. Quick connects shall be configured to facilitate direct air blow-out of condensate discharge pipe.

C. Sump Installation shall be as follows:

1. Assemble and install sump and backfill the excavation as promptly as progress of the work permits.
2. Set sump vertically plumb and centered in the excavation.
3. Install the pump as indicated on the Contract Drawings and in accordance with the manufacturer's instructions.
4. Place backfill materials to the levels and dimensions shown on the Contract Drawings.
5. Place and compact backfill materials in a controlled manner to avoid bridging, overfilling, or damaging the sump.

2.05 COMPRESSED AIR SUPPLY SYSTEM

A. General: Provide a complete compressed air system on the LFG handling skid as shown on the Contract Drawings and specified herein to power the condensate pumping system and the condensate injection system described elsewhere in this Section. The compressed air system shall include one (1) receiver mounted air compressor, with conditioning equipment as required to continuously meet inlet air quality specifications of the condensate pumps and injector system.

B. Air Compressor:

1. General: Provide one (1) 15 hp rotary screw air compressor, Ingersoll-Rand Co. EP-15, or ENGINEER approved equal.
2. Construction and Performance: Specific Construction and Performance Requirements shall be as follows:

a. Motor: TEFC 240-480 Volt, 3 Phase, 60 Hz
b. 120 gallon tank, ASME designed and constructed, with support legs for anchoring the tank, inspection ports with threaded plugs, bottom drain connection and valve, air outlet connection and valve, pressure relief valve, pressure gauge, and pressure switch.
c. Operating pressure range, psi — 80 to 125
d. Compressor air delivery rate, scfm at 125 psi — 53 (Min.)

C. Refrigerated Air Dryer:

1. General: Provide one (1) refrigerated air dryer, Ingersoll-Rand Co. SDR50, or ENGINEER approved equal.
2. Construction and Performance: Specific Construction and Performance Requirements shall be as follows:

a. Pressure dewpoint range, degrees F (with inlet temp. of 100 degrees F) — 33 - 39

b.	Operating pressure range, psig	60 – 250
c.	Operating voltage	115

D. Coalescing Filter:

1. General: Provide one (1) coalescing filter, Deltech Model 812 or ENGINEER approved equal, with three (3) spare filter elements.
2. Construction and Performance: Specific Construction and Performance Requirements shall be as follows:

a.	Impingement and centrifugal separation/removal capability of particles, oil and water, percent	99.9
b.	Operating pressure range, psig	60 - 125
c.	Air temperature range, °F	40 - 125
d.	Air flow rate range, acfm	0 - 43
e.	Maximum initial (clean) pressure drop, psig	3

f. Cast aluminum filter top with 1/2-inch FNPT inlet and outlet connections and differential pressure gauge
g. Cast aluminum filter bottom bowl with manual primary and secondary drain valves
h. Replaceable filter element with multi-media layers

E. Particulate Filters:

1. General: Provide particulate filters, Deltech model 503 or ENGINEER approved equal, with three (3) spare filter elements.
2. Construction and Performance: Specific Construction and Performance Requirements shall be as follows:

a.	Particle filtration capability, microns	<10
b.	Operating pressure range, psig	60 - 125
c.	Air temperature range, °F	40 - 125
d.	Air flow rate range, acfm	0 -58
e.	Maximum initial (clean) pressure drop	1 psig

f. Cast aluminum filter top with 1/2-inch FNPT inlet and outlet connections and differential pressure gauge
g. Cast aluminum filter bottom bowl with manual drain valve
h. Replaceable filter element with pleated resin impregnated polyester fiber reinforced filter media

2.06 COMPRESSED AIR PIPING

A. Provide compressed air process train complete with valves, regulators, pressure gauges, pressure piping, and supports as required and as shown on the Contract Drawings. Pressure piping and other process train components shall be fabricated from materials in accordance with the air compressor manufacturer's recommendations.

2.08 PROPANE TANKS AND PILOT FUEL PIPING

A. Provide one (1) 100-gallon capacity rental propane gas tank (filled with propane) complete with pressure regulator, pressure gauge, propane content indicator, valves, piping, supports, and pressure hose for connecting to the flare's pilot flame piping.

2.09 EQUIPMENT SKID

A. Provide one (1) 10 ft. x 38 ft. heavy-duty structural steel sub-base with non-skid floor plate welded over all open areas. Skid shall be constructed of I-beams and other materials sufficiently rigid to withstand all loading and hauling forces. All necessary bracing, mounting pads, and piping supports shall be provided for proper equipment installation.

B. Equipment to be mounted on skid includes: centrifugal LFG blowers, condensate knockout pot, condensate injection equipment, air compressor, enclosed flare, all necessary control panels, and all associated piping, valves, and fittings.

2.10 VERTICAL CONDENSATE STORAGE TANK

A. Provide one (1), 1,100-gallon (minimum) vertical polyethylene storage tank as shown on the Contract Drawings, and as provided by Poly Cal Plastics, French Camp, CA (209/982-4904), Central California Container MFG, or ENGINEER approved equal. The storage tank shall be rotationally molded and fabricated from cross-linked high-density polyethylene (XLHDPE) and manufactured in accordance with ASTM D1998.

B. Tank shall be designed for storage of landfill gas condensate in exposed area, at atmospheric pressure and ambient temperatures of 25 to 130 degrees Fahrenheit. Tank wall thickness shall be rated for liquid specific gravity of up to 1.65. PE resin shall be Marlex CL-200, or ENGINEER approved equal. Resin shall not contain any fillers, and UV-stabilizers shall be less than 0.5 percent by weight.

C. Provide tank with vents, openings, fittings, and accessories as shown on the Contract Drawings. Coordinate fitting requirements for level switches provided with condensate injection system. Submit shop drawings for approval of OWNER/ENGINEER, prior to beginning fabrication.

D. Provide tank lateral restraints, designed and constructed in accordance with the latest edition of the Uniform Building Code, for the wind and seismic criteria specified for the location. Tank foundation and lateral restraint system shall be designed by the tank supplier. CONTRACTOR shall verify methods and procedures for securing the storage tank to the foundation, with the tank manufacturer.

E. Tank shall be provided with a corrosion resistant tag outlining intended service, serial number, date of manufacturer, capacity, and resin type. Tanks shall have a warranty for five (5) years to be free from defects in material and workmanship. The warranty shall fully cover the tank during the first three (3) years of service and be prorated during the remaining two (2) years of the warranty period.

F. Prior to its delivery to the site, the tank shall be hydrostatically tested for 24-hours and leak checked by the tank manufacturer. No leakage will be allowed. A certified test report shall be submitted to the OWNER/ENGINEER. Tank shall be inspected upon receipt to identify problems resulting from shipping and handling.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION OF EQUIPMENT

A. Coordination of delivery schedules for equipment to be provided by the CONTRACTOR.

B. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

C. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the OWNER/ENGINEER, anchoring all components firmly into position for long life under hard use.

D. Upon completion of the installation, make all required arrangements, conduct all required tests, make all required changes, and secure all required inspections and approvals. Contractor to provide flare/blower skid manufacturers technical representative for 3 days of on-site testing, operation, and training, at completion of system installation.

E. When final approvals have been received, demonstrate to the OWNER's maintenance personnel that the contents of the operation and maintenance manuals are complete as required under Part 1 above.

3.03 ACCEPTANCE TESTING OF EQUIPMENT

F. The OWNER/ENGINEER will retain an independent testing company to conduct compliance testing of the operating flare system, for performance criteria of these Specifications and the SJVUAPCD permit and rule requirements. The OWNER/ENGINEER will not accept the flare facility until compliance to these performance criteria is verified by this testing, in writing. All work and materials required to correct problems arising from non-conformance, including re-testing if required, shall be performed and provided at no additional expense to the OWNER/ENGINEER.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Measurement for the LFG handling and enclosed flare skid shall be based on a lump sum price for the procurement, delivery, and installation of the components at the site, including skid, piping, valves, condensate knockout pot, blowers, condensate injection system, flare, pilot fuel piping, propane tank, pipe supports, equipment enclosures, compressed air supply, controls and all accessories and appurtenances shown on the Contract Drawings and specified in these Specifications. Installation of the Blower/Flare Facility equipment shall be based on the lump sum price for furnishing all labor, equipment, materials, and incidentals necessary to install, connect, test, and start-up the LFG handling skid, flare and all gas, air, and condensate piping, valves, appurtenances and accessories, in accordance with the Contract Drawings.

B. Measurement for installation of the compressed air supply system, including air compressor, receiver, dryer and filters, shall be considered incidental and supplementary to the Blower/Flare Facility.

C. Measurement for providing and installing condensate equipment shall be based on the lump sum price for furnishing all labor and materials for the condensate storage facility equipment, including tank, piping, valves, and fittings connecting up to, but not including, the condensate injection system, in accordance with the Contract Drawings.

D. Measurement for condensate collection sumps and pumps will be based on a per each basis and will include furnishing, installing, testing, and proper functioning and operation of the condensate sump, pump assembly, and appurtenant items.

4.02 PAYMENT

A. General: Payment constitutes full compensation for furnishing all labor, equipment, materials, and incidentals necessary to provide all equipment covered in this Section, complete and properly operating, in accordance with the Contract Drawings, as specified, and as may otherwise be required.

B. Payment for the complete Blower/Flare Facility and appurtenances shall be based on the lump sum price quoted in the Bid Schedule for "Provide and Install Gas Equipment".

C. Payment for the complete condensate storage tank and appurtenances shall be based on the lump sum price quoted in the Bid Schedule for "Provide and Install Condensate Equipment".

D. Payment for the complete Condensate Sumps and appurtenances shall be based on the price per unit installed as quoted in the Bid Schedule for "Field Condensate Sumps".

END OF SECTION

SECTION 15480
PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All piping as shown on the Contract Drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to, the following:

1. Landfill gas piping
2. Landfill gas condensate piping (drainage and force main)
3. Air supply piping
4. Road crossings

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 - Product Options and Substitutions
D. Section 01720 - Project Record Documents
E. Section 01730 - Installation, Operation and Maintenance Instructions
F. Section 02221 - Excavating, Backfilling, Compacting, and Grading
G. Section 02687 - Landfill Gas Wells and Wellheads
H. Section 09910 - Painting
I. Section 11000 - Equipment

1.03 REFERENCES

A. ASTM D1785 Standard Specifications for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120

B. ASTM D2466 Standard Specification for Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40

C. ASTM D2564 Standard Specification for Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe Fittings

D. ASTM D2467 Standard Specification for Socket -Type Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80

E. ASTM D2464 Standard Specification for Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80

F. ASTM D3915 Standard Specifications for Polyvinyl Chloride (PVC) and Related Plastic Pipe and Fittings Compounds

G. ASTM F656 Standard Practice for Primers for Use in Solvent Cement Joints at Polyvinyl Chloride (PVC) Plastic Pipe Fittings

H. ASTM D2855 Standard Practice for Making Solvent-Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings

I. ASTM D3350 Standard Specification for Polyethylene (PE) Plastic Pipe and Fittings Materials

J. ASTM F714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

K. ASTM D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing

L. ASTM D1248 Standard Specification for Polyethylene Plastics Molding and Extrusion Materials

M. ASTM D2241 Standard Specification for Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)

N. ANSI B16.5 Steel Pipe Flanges, Flanged Valves, and Fittings

O. ASTM F405 Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings

P. ASTM F667 Standard Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings

Q. AASHTO M252 Standard Specification for Corrugated Polyethylene Drainage Tubing

R. AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe, 12- to 24-inch Diameter

S. ASTM A53 Specification for Welded and Seamless Steel Pipe

T. ASTM A120 Specification for Welded and Seamless Pipe, Steel, Black and Hot-Dipped Zinc Coated (Galvanized)

U. ANSI B16.3 Cast-Iron Threaded Fittings, Class 150 and 300

V. ASTM B43 Specification for Seamless Red Brass Pipe, Standard Sizes

W. ANSI B31.1 Safety Code for Pressure Piping

X. ASTM D2513 Standard Specification for High Density Polyethylene (HDPE) pipe and fittings.

1.04 SUBMITTALS

A. Product Data: Within 15 calendar days after the CONTRACTOR has received the OWNER's Notice to Proceed, submit

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's Specifications, catalog cuts, and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when approved by the OWNER/ENGINEER, will become the basis for accepting or rejecting actual installation procedures used on the work.

B. Shop Drawings: Within 15 calendar days after the CONTRACTOR has received the OWNER's Notice to Proceed, submit Shop Drawings and other data as required to indicate method of constructing, installing and supporting piping except where such details are fully shown on the Contract Drawings.

C. Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the OWNER/ENGINEER operation and maintenance manuals compiled in accordance with provisions of Section 01730 and as-constructed Record Drawings prepared in accordance with the provisions of Section 01720.

1.05 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Regulatory Requirements:

1. Without additional cost to the OWNER, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.
2. In addition to complying with the specified requirements, comply with pertinent regulations of governmental agencies having jurisdiction.
3. In the event of conflict between or among specified requirements and pertinent regulations, the more stringent requirement will govern unless otherwise directed by the OWNER/ENGINEER.

C. In addition to complying to the specified requirements, comply with the directions of the OWNER/ENGINEER.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle and store all piping in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PIPE:

A. Provide Schedule 40 and Schedule 80 PVC pipe complying with ASTM D 1785.

B. PVC Fittings:

1. Provide Schedule 40 PVC fittings 8 inches and smaller complying with ASTM D 2466, socket-type.
2. Provide PVC fittings 10 inches and larger rated for minimum pressure of 80 psig at 73°F and injection molded from Type 1 PVC.
3. Provide Schedule 80 PVC fittings complying with ASTM D 2467 for socket-type and ASTM D 2464 for threaded-type.

C. PVC Flanges:

1. Provide 150-pound, flat-face, socket-type Schedule 80 PVC flanges. Diameter and drilling of flanges shall comply with ANSI B16.5 for Class 150.
2. Provide full-face, neoprene flange gaskets, 1/16-inch thick with "A" scale hardness of 45 to 60 durometer.
3. Provide correct number and sizes of steel hexagon bolts, washers, and hexagon nuts, electrogalvanized with zinc or cadmium.

D. PVC Solvent Primer: Provide solvent primer as recommended by PVC product supplier and complying with ASTM F 656.

E. PVC Solvent Cement: Provide medium-bodied solvent cement as recommended by PVC product supplier and complying with ASTM D 2564.

2.02 FLEXIBLE PIPE COUPLINGS

A. Provide flexible couplings for pipe expansion/contraction compensation as shown on the Contract Drawings, Industrial Tube Corporation Model IT-6000 or ENGINEER approved equal.

B. Provide stainless steel hose band-clamps of correct size with hexagonal and slotted adjusting screw.

2.03 FLEX HOSE

A. Provide flex hose for well head assemblies as shown on the Contract Drawings, industrial vacuum loader hose by Salem-Republic Rubber Company (800.686.4199), or ENGINEER approved equal, for medium-vacuum, methane applications. Hose shall be provided with soft cuffs, with inside diameter to match the outside diameter of PVC or HDPE pipe to be connected. Minimum bend radius shall provide permanent 90° bend between wellhead and lateral pipe, without causing internal damage or kinking. Hose shall be fabricated from a polyester reinforced styrene-butadiene rubber (SBR) and neoprene rubber (NR) blend, with embedded high-tensile steel wire. Outer cover shall be resistant to UV, ozone, and weathering for long-term, exposed service.

B. Provide stainless steel hose band-clamps of correct size with hexagonal and slotted adjusting screw.

2.04 POLYETHYLENE (PE) PIPE

A. Provide PE pipe of SDR indicated on the Contract Drawings complying with ASTM D 2513 and ASTM D 3350, D 3287, and F 714, where applicable made from resins conforming to ASTM D 1248.

B. PE Fittings:

1. Provide PE fittings complying with ASTM D2513 and ASTM D3350 and D3261, where applicable made from resins conforming to ASTM D1248.
2. Provide PE fittings of the same manufacturer and resin material as PE pipe.
3. Provide fabricated fittings fabricated from PE pipe with an SDR which are equal to or one rating heavier (thicker wall) than the pipe to which they are joined.

C. PE Resin:

1. Provide PE products made from a high density, high modulus resin conforming with cell classification PE 3245434C or better in accordance with ASTM D3350.

2.05 CONDENSATE PIPING

1. Condensate drain lines and force mains for the field condensate sumps shall be HPDE, SDR 11, fabricated from materials as specified in paragraph 2.04 of this section.

2. Air supply lines for the field condensate sumps shall be HPDE, SDR 9, fabricated from materials as specified in paragraph 2.04 of this section.

2.06 CORRUGATED METAL PIPE

A. All corrugated metal pipe to be used for road crossing encasements for the LFG main header pipe shall be 16 gauge galvanized steel or aluminum pipe.

B. Corrugated metal pipes are intended to contain all pipes at each road crossing, with sufficient clearance to allow future movement or removal.

2.07 VALVES

A. Gate Valves:

1. Provide PVC body and trim valves with non-rising stem, as manufactured by Asahi-America or approved equal.

B. Butterfly Valves:

1. Provide PVC, wafer-type butterfly valves with nitrile seals, Asahi-America, +GF+, or ENGINEER approved equal.
2. 4 Inch and Smaller: Provide lever-operated handle.
3. 6 Inch and Larger: Provide gear-operated handle.

C. Check valves:

1. 2 inch and smaller: Provide PVC, true union body, threaded or socket ball check valves, with viton seals.
2. 3 inch and larger: Provide PVC, flanged, double disc check valves, Technocheck or ENGINEER approved equal.

D. Condensate Ball valves, 2 inch and smaller: Provide PVC, true union body, threaded or socket type valves, with Teflon seats and nitrile seals.

E. Air and Condensate Isolation butterfly valves, 2-inch: Provide CSR HDPE Time Saver Valve, SDR 11 System, or ENGINEERED approved equal, with Viton seats and seals for condensate applications. Provide air and condensate isolation valves at each LFG isolation valve location.

F. True Unions: Provide PVC Sch 80 unions, threaded or socket type, with Viton O-rings.

G. Header Monitoring Ports: Provide polypropylene quick-disconnect couplings, Colder Products or ENGINEER approved equal, 1/8-inch female shut-off with 1/4-inch male NPT end. Ports to match extraction wellhead monitoring ports.

H. Provide propane valves as shown in the Contract Drawings.

2.08 PIPE SUPPORTS

A. Provide the pipe supports as shown on the Contract Drawings, specified, and required to adequately support and secure all piping systems and to minimize stress to all equipment connections, pipe, valves, and fittings.

1. Provide pipe supports fabricated from metal framing channel and fittings with electrogalvanized zinc or cadmium finish, as supplied by Unistrut, Superstrut, or ENGINEER approved equal.
2. Pipe supports shall provide clearance between guides and the outside diameter of the pipes, to allow free sliding.

2.09 GRADE BOXES

A. Header isolation valves: Provide rectangular valve box and lid, Christy Fibrelyte FL36 or ENGINEER approved equal, at each header isolation valve.

B. Condensate sumps: Provide a concrete vault, Christy R27x36 or ENGINEER approved equal, at each sump location to house sump-head and all necessary compressed air and condensate piping, valves, and instruments, as shown on the Contract Drawings. Provide each vault with non-traffic rated, aluminum or galvanized steel double-leaf access doors. Doors shall be hinged and spring assisted, with stainless steel hardware, locking support arm, and neoprene weather seal.

C. Monitoring ports: Provide circular valve box and lid, Christy Fibrelyte FL8 or ENGINEER approved equal, at each header monitoring point.

2.10 PIPE TRENCH BACKFILL MATERIALS

A. Provide trench backfill as specified in Section 02221.

2.11 OTHER MATERIALS

A. Provide all other materials, not specifically described but required for a complete and proper installation, as selected by the CONTRACTOR subject to the approval of the OWNER/ENGINEER.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected. Notify the OWNER/ENGINEER of such conditions and proposed corrective action before correcting unsatisfactory conditions.

3.02 PREPARATION

A. Lay out the piping systems in careful coordination with the Contract Drawings, determining proper elevations and locations for all components of the system and using only the minimum number of fitting bends to produce a satisfactorily functioning system. In special cases and with the approval of the OWNER/ENGINEER, bends in piping shown on the Contract Drawings may be eliminated by gradual deflection of straight pipe runs.

B. Follow the general layout shown on the Contract Drawings in all cases except where other work may interfere or field conditions deviate from conditions shown in Contract Drawings.

C. Obtain the approval of the OWNER/ENGINEER for the layout of all piping systems before and during pipe installation.

3.03 INSTALLATION

A. General:

1. Proceed as rapidly as other sitework activities will permit.
2. Thoroughly clean piping materials before installation. Cap pipe openings to exclude rodents and dirt until final connections have been made.
3. Cut pipe accurately, and work into place without springing or forcing.
4. Install landfill gas piping at a minimum of 3 percent slope unless otherwise noted on the Contract Drawing or approved by the OWNER/ENGINEER.
5. Provide sufficient expansion and contraction compensation, flexible couplings, and devices necessary for a flexible piping system, whether or not shown on the Contract Drawings.

B. Equipment Access: Install piping, equipment, and accessories to permit access for maintenance. Relocate items as necessary to provide such access, and without additional cost to the OWNER.

C. Flange Connections: Install gaskets centered on flanges and tighten bolts to torque requirements recommended by flange and/or valve manufacturer. Replace flanges damaged by overtightening, at no cost to the OWNER.

D. Flexible couplings:

1. Install flexible couplings as pipe laying and pipe anchors are being installed at locations shown on the Contract Drawings. Flexible couplings shall be compressed or expanded to meet temperature conditions at the time of installation as shown on the Contract Drawings.
2. Bevel and clean both pipe ends.
3. Insert pipe ends into coupling cuffs 2-1/2 inches.
4. Install and tighten (but do not overtighten) hose clamps.

E. Polyvinyl chloride (PVC) pipe and fitting:

1. Construct PVC piping system using solvent cemented joints made in accordance with the pipe manufacturer's instructions.
2. Inspect PVC pipe and fittings for cleanliness and damage prior to placing and joining. Remove and replace all damaged piping materials.
3. Wipe clean both inside and outside surfaces of the two ends to be joined and remove dirt, oil, and foreign materials.
4. Ensure that primer and cement are kept free of contaminants.
5. Allow cemented joints to cure in accordance with the times recommended by the pipe manufacturer.
6. Do not test, stress, pull, or lay new joints on ground until joint has sufficiently cured.
7. Visually inspect each new joint for misalignments, gaps, or voids in joint.
8. Paint all exposed PVC piping and fittings in accordance with Section 09900 of these Specifications. Do not paint any moving parts.

F. Polyethylene (PE) pipe and fitting:

1. Construct PE piping systems using butt fusion methods in accordance with the pipe and fusion equipment manufacturer's instructions. Allow for additional lengths of pipe for expansion and contraction.
2. Provide appropriate fusion equipment for pipe size under construction.
3. Inspect PE pipe and fittings for cleanliness and damage prior to placing and joining. Remove and replace all damaged piping material.
4. Wipe clean both inside and outside surfaces of the two ends to be joined and remove dirt and foreign materials.
5. After cutting pipe ends, do not touch newly-faced surfaces.
6. Ensure that fusion tools are free of contaminants.
7. Heat the surfaces to be joined simultaneously and fuse together in accordance with time and temperature requirements recommended by the material manufacturer.
8. Allow butt fused joints to cool for time duration recommended by manufacturer.
9. Do not remove new joint from fusion equipment for an additional three minutes.
10. Do not test, stress, pull, or lay new joint on ground for 10 minutes after removal from fusion unit.
11. Visually inspect each new joint for misalignments, gaps, or voids in joint. Bead thickness and melt pattern shall comply with manufacturer's recommendations. Joints not meeting OWNER's/ENGINEER's approval shall be cut out and remade at no additional cost to the OWNER.

3.04 PIPE SUPPORTS

A. Space supports for horizontal pipes as shown on the Contract Drawings.

B. Arrange pipe supports to prevent excessive pipe deflection, and to avoid excessive bending stress.

C. Anchor pipe supports in concrete slabs or footings, as shown on the Contract Drawings.

D. Space wood blocks for supporting LFG piping within the encased road crossings and elevated crossing to prevent excessive pipe deflection, and to avoid excessive bending stress.

3.05 VALVES

A. Locate and arrange valves to provide complete adjustment between fully open to fully closed position.

B. Install valves in at least the following locations:

1. On both sides of apparatus and equipment.
2. For shutoff of branch mains.
3. Where shown on the Contract Drawings.

C. Locate valves for easy accessibility and maintenance.

D. Install valves in closed position, with valve stems vertical.

3.06 TRENCHING AND BACKFILLING

A. Contractor shall conform to all requirements for Trench and Site Safety as specified in Section 01190.

B. Perform excavation of every description and of whatever substances encountered to depth indicated or as otherwise shown and specified. Grade trench bottoms to suit required piping slopes. Grade as necessary to prevent surface water from flowing into trenches. Remove any water accumulating therein by pumping or other approved methods. Notify the OWNER/ENGINEER immediately of any continuous water flow into trench. Sheet and brace excavations as necessary to fully protect workmen and adjacent structures and permit proper installation of work. Under no circumstances lay pipe or install appurtenances in water, without approval of the OWNER/ENGINEER. The presence of ground water in soil or the necessity of sheeting or bracing of excavations shall not constitute a condition for which any increase may be made in contract price.

C. Excavate trenches to the necessary width for proper laying of pipe. Backfill overdepths using methods and procedures specified for backfilling the lower portion of trenches. When wet or unstable material is encountered at bottom of trench, remove such material to depth required as directed by OWNER/ENGINEER and backfill to proper grade with suitable approved material. Grade bottom of trench accurately to provide uniform bearing and support for each piping section at every point along its entire length. Remove stones and all other protrusions from trench bottom.

D. Place bedding material to dimensions shown in drawings. Bedding material shall be carefully placed in bottom of trench, so as to ensure a uniform thickness below the pipe.

E. Backfill pipe trenches with the backfill materials shown and specified, and compact as shown and/or specified.

F. After backfill is completed, remove unused excavated and backfill materials to areas designated by OWNER/ENGINEER.

3.07 PRESSURE TESTING

A. Before pressure testing, blow the pipe clean of dirt and debris and remove from systems equipment which would be damaged by test pressure. Replace equipment after testing. Systems may be tested in sections.

B. Pressure tests shall be performed on the following piping systems and specified parameters:

1. LFG collection piping:	Compressed air, with a test pressure of 10 psi.
2. 2-inch HDPE condensate forcemain piping:	Water, with a test pressure of 100 psi
3. Air supply piping:	Water, with a test pressure of 150 psi

C. Conduct all pressure testing in accordance with the pipe manufacturer's recommendations and procedures. Test pressures shall be contained for a minimum of 1-hour, with no change in pressure, except that calculated due to temperature change.

D. Locate and repair all leaks. Correct leaks by replacing faulty materials with new material.

E. Repeat pressure testing until all piping systems pass. Perform additional pressure tests after repair of each system at no cost to the OWNER.

F. Test solenoid and pressure relief valves for proper operation at settings indicated. Test pressure relief valves three times.

G. The CONTRACTOR will be responsible for notifying the OWNER/ENGINEER at least 48 hours in advance so that the OWNER/ENGINEER may be present during testing.

3.08 PROTECTION

A. Protect all installations and materials from damage until final acceptance by the OWNER/ENGINEER.

B. Prevent debris from entering into piping systems during installation.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. LFG Piping: Measurement for HDPE LFG piping will be from, and including, the flex hose at the well heads to the inlet to the butterfly valve located at the inlet to the knockout pot on the LFG Blower/Flare skid for each size of LFG pipe. Measurement will include all trenching, pipe joining and installation, backfilling, compaction, testing, fittings, valves, grade boxes, and other appurtenances needed to complete the LFG piping system as shown on the Contract Drawings.

B. Condensate Air Supply/Force Main Piping: Measurement for HDPE condensate and air supply piping installed outside the Blower/Flare Facility will include all trenching, pipe joining and installation, backfilling, compaction, testing, fittings, valves, grade boxes, and other appurtenances needed to complete the HDPE piping systems as shown on the Contract Drawings.

C. Encased Road Crossings: Measurement for encased road crossings will be by length of corrugated metal pipe in place, and will include all additional trenching, pipe installation, backfilling, compaction, testing, and other appurtenances needed to complete the above and below ground encased road crossings as shown on the Contract Drawings.

D. Flare Facility Piping: Measurement for providing and installing and LFG piping, condensate piping, air piping, and propane piping shown within the Blower/Flare Facility shall be based on the lump sum price for furnishing all labor and materials for Equipment Complex piping, valves, and fittings.

4.02 PAYMENT

A. LFG Piping: Payment for LFG piping shall be based on the unit price quoted per linear foot in the Bid Schedule for each pipe size and constitutes full compensation for furnishing all labor, equipment, materials, and incidentals necessary to install the LFG piping in accordance with the Contract Drawings, as specified, and as may otherwise be required.

B. Condensate Air Supply/Force Main Piping: Payment for piping shall be based on the unit price quoted per linear foot in the Bid Schedule and constitutes full compensation for furnishing all labor, equipment, materials, and incidentals necessary to install the HDPE piping in accordance with the Contract Drawings, as specified, and as may otherwise be required.

C. Encased Road Crossings: Payment for encased road crossings shall be based on the unit price quoted per linear foot in the Bid Schedule for "Road Crossings" and constitutes full compensation for all labor, equipment, materials, and installation in accordance with the Drawings.

D. Flare Facility Piping: Payment for Flare Facility Piping (LFG piping, condensate piping, air piping, and propane piping) shown for the Equipment Complex shall be by the lump sum quoted in the Bid Schedule.

END OF SECTION

SECTION 16050
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All labor, materials, equipment, and services to construct and install complete new electrical systems and service as described herein and as shown on the Contract Drawings.

B. Any apparatus, appliance, material, or work not shown on the Contract Drawings, but mentioned in the Specifications, or vice versa, or accessories necessary to make the Work complete in all respects and ready for operation, even if not particularly specified, shall be furnished, and installed by the CONTRACTOR without additional expense to the OWNER.

C. The Contract Drawings are diagrammatic and do not show all offsets, bends, elbows, or other specific elements, which may be required for proper installation of the Work. Such accessories and routing will be provided to complete the Work at no additional cost to the OWNER. The right is reserved to make any reasonable changes in outlets, lighting, or equipment locations, prior to rough-in, without any additional cost to the OWNER.

1.02 WORK INCLUDED

A. Those items included under this Section of Specifications shall include, but not necessarily be limited to, the following:

1. Motor control center (MCC), and feeders.
2. Flame safeguard controls.
3. Level switches and controllers.
4. Telephone service provisions and raceways.
5. Flare control installation and connections.
6. Branch circuit wiring, wiring devices, and connections to all equipment requiring electrical service.
7. Lighting controls and security lighting fixtures, completely lamped.
8. Power and control wiring and connections.
9. Equipment supports.
10. Electrician for all testing and start-up assistance.
11. Grounding Work.
12. All required incidental work, such as excavating, backfilling, and testing.
13. All other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the Contract Drawings.

B. It is the intent of the Contract Drawings and Specifications that electrical systems be complete and, except as otherwise noted, ready for operation.

C. CONTRACTOR is responsible for contacting the local electrical utility, Pacific Gas and Electric, to coordinate responsibilities for providing and installing electrical service to the Blower/Flare Facility, including the tie-in, transformer, meter socket and meter, and main disconnect at the location shown on the Contract Drawings.

1.04 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 09910 - Painting

D. Section 11000 - Equipment
E. Section 16100 - Basic Electrical Materials and Methods
F. Section 16500 - Lighting
G. Section 16910 - Control Panels

1.05 REFERENCES

A. Work and materials will conform to the latest rules of the National Board of Fire Underwriters' Code, regulations of the State Fire Marshal, and applicable local and state codes. Nothing in these Specifications will be construed to permit work not conforming to the most stringent applicable codes.

B. The current adopted editions of the following codes and reference standards will also apply.

1. American National Standards Institute (ANSI)
2. American Society for Testing and Materials (ASTM)
3. Certified Ballast Manufacturers (CBM)
4. Insulated Power Cable Engineer Association (IPCEA)
5. International Electrical Testing Association (NETA)
6. National Electric Code (NEC)
7. National Electrical Manufacturers Association (NEMA)
8. Underwriters Laboratories, Inc. (UL)
9. Uniform Building Code (UBC)
10. Uniform Fire Code (UFC)
11. Uniform Mechanical Code (UMC)

1.06 DEFINITIONS

A. "Reasonable change" will be interpreted as including any change of up to six (6) feet from the locations indicated on the Contract Drawings. Changes will be approved by ENGINEER prior to execution of the Work.

1.07 SEISMIC REQUIREMENTS

A. All electrical equipment shall be designed, constructed, and installed in accordance with all applicable codes for the seismic requirements for the project site region.

1.08 SUBMITTALS

A. Submittals shall consist of detailed shop drawings, specifications, catalog "cuts," and data sheets containing physical and dimensioned information, performance data, electrical characteristics, materials used in fabrication and material finish. Include seismic data regarding installation and seismic-withstand certification for all electrical equipment weighing more than 500 pounds.

B. Provide product data for the following:

1. Light Fixtures and Poles
2. Disconnect Switches
3. Motor Starters
4. Control Panel Enclosures
5. Control Devices
6. Motor Control Center
7. Level Controls
8. Flame Safeguard Controls
9. Service Entrance Components
10. Main Distribution Panel

11. Autodialer

1.09 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Regulatory Requirements: Provide all necessary notices, obtain all permits and pay all government taxes, fees, and other costs in connection with this Work. Obtain all required certificates of inspection for work and deliver same to the OWNER before final acceptance and final payment.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Materials: Materials shall be new and shall be delivered to the Site in the original packaging.

B. Wire and Cable: Deliver wire and cable to the Site in unbroken packages or reels.

PART 2 PRODUCTS

2.01 NAMEPLATES

A. Construction: Laminated phenolic plastic (white front and back), black core with lettering etched through outer covering; use 3/16-inch-high lettering at push button stations, thermal overload switches, receptacles, wall switches, and similar devices, where nameplate is attached to device plate; use 1/4-inch-high lettering at all other locations, unless otherwise specified or detailed; engraving directly on device plates with black enamel-filled lettering is acceptable in lieu of separate plastic nameplates. Nameplates may be of nonferrous metal, 0.03-inch-thick minimum, die stamped.

B. Inscription: If detailed on the Contract Drawings, use inscription exactly as shown; otherwise, describe adequately function or use of equipment involved.

1. For Panelboards and Switchboards: Include panel designation voltage and phase of supply (e.g., Panel A, 208Y/277-480V, 3PH voltage). Use 1-inch-high lettering at panelboards, switchboards, or other power distribution equipment.
2. For Power Receptacles: Indicate voltage and phase (e.g., 480V, 3PH).
3. For Motors: Make nameplate on motor of particular machine exactly the same as that for respective starter, disconnect switch, and push-button station (e.g., Fan RF-1).

2.02 WARNING SIGNS

A. Use signs of standard manufacture, No. 18-gauge-minimum steel, 7-inch by 10-inch with 2-inch-high letters, on baked enamel finish, with red letters on white background. Sign legend: "DANGER-EQUIPMENT STARTS AUTOMATICALLY."

B. Install one sign at each access point to the Blower/Flare Facility.

2.03 FINISHES

A. Factory Finish: Pull and junction boxes, panelboard cabinets, equipment enclosure, and so on, factory finished as follows:

1. Surface-Mounted Boxes: One prime coat over galvanizing, one coat of light-gray-synthetic enamel or lacquer.

2. Flush-Mounted Boxes: Galvanized only.
3. Surface-Mounted Fronts: One prime coat, one coat of light-gray-synthetic enamel or lacquer.
4. Flush-Mounted Fronts: Prime coat only.

B. Equipment Enclosures: Transformer cases, high-voltage equipment including switchgear, special equipment enclosures, and other enclosures, shall be manufacturer's standard unless otherwise specified.

C. Field Painting:

1. Unless otherwise specified herein and in other Sections of this Specification, or indicated on the Contract Drawings, all exterior-exposed metal shall be painted. Leave electrical work requiring painting in a clean, dry, and smooth condition suitable for painting.
2. Paint all exposed ferrous metals that are not galvanized or factory finished. Use one coat of approved asphaltic aluminum paint over prime coat.
3. Where field painting of metals is required, metal to be painted shall be cleaned, pretreated, primed, and given two (2) finish coats of paint as follows:

a. Cleaning: Remove rust, scale, grease, oil dirt, preservative coatings, or other deleterious matter. Treat all bare and clean metal with primer pretreatment, before priming.
b. Primer:

(1) Steel and Iron (Not Galvanized): Red Base Primer or Basic Silico Chromate Primer.
(2) Aluminum: Zinc Chromate Primer.
(3) Galvanized Steel and Nonferrous Metals: Zinc Dust Oxide Primer. Apply second coat as soon as possible after priming to provide for proper bonding to primer coat.

c. Finish Coats: One coat of exterior synthetic enamel undercoated and one coat of industrial epoxy enamel, color to be light gray.

4. Do not paint the following:

a. Transformer cases, switchboards, high voltage switchgear, and equipment.
b. Lighting fixtures and factory-finished fixture hangers and stems.
c. Switch and receptacle plates which have factory finish other than prime coat or galvanizing.
d. Panelboard, except as required.

5. Refer to Section 09910 for additional painting instructions.

D. Stenciling: After all field painting is completed, paint all stenciled identification of high-voltage conduits, and such, as shown on the Contract Drawings, specified, or required by codes.

E. Plywood Backing Boards: One prime coat, one coat of light gray latex enamel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Notify the OWNER and the ENGINEER of such conditions and proposed corrective actions before correcting unsatisfactory conditions. Do not proceed until unsatisfactory conditions are corrected.

3.02 GROUNDING

A. Install an insulated equipment grounding conductor in all branch circuit and feeder conduits and include the following:

1. Connect service neutral and ground buses to the grounding electrode system UFER ground and ground rod.
2. Connect structural steel and equipment skids to the ground system as indicated on the Contract Drawings.

3.03 TESTS

A. The OWNER\ENGINEER reserves the right to inspect and test any portion of the equipment, materials, or both during the progress of its erection. The CONTRACTOR will test all wiring and connections for continuity and grounds before connecting any fixtures or equipment.

B. The CONTRACTOR will test the entire system, as requested, in the presence of the OWNER\ENGINEER, when the work is completed to ensure that all portions are free from shorts or grounds. The CONTRACTOR shall provide all equipment necessary to conduct these tests.

3.04 CUTTING AND PATCHING

A. No cutting of finished or structural work may be done without approval of the OWNER\ENGINEER. When necessary to have finished material or structural work cut, furnish necessary shop drawings to the OWNER\ENGINEER.

3.05 PROTECTION

A. Protect and cover all equipment during construction and clean and touch up where necessary to remove scars and scratches on all factory-painted equipment. Nameplates bearing descriptive data shall be left clean and unpainted.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Measurement for providing and installing site electrical and communications work shall be based on the lump sum price for furnishing all labor and materials.

4.02 PAYMENT

A. General: Payment constitutes full compensation for furnishing all labor, equipment, materials, and incidentals necessary to provide a fully functioning electrical power, communications, and control system to all equipment covered in these specifications, complete and properly operating, in accordance with the Contract Drawings, as specified, and as may otherwise be required.

B. Payment for the complete site electrical and communications work shall be based on the lump sum price quoted in the Bid Schedule for "Electrical Site Work".

END OF SECTION

SECTION 16100
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic electrical material and method requirements for constructing a complete workable electrical system as shown on the Contract Drawings and specified in this Section.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 - Product Options and Substitutions
D. Section 01720 - Project Record Drawings
E. Section 11000 - Equipment
F. Section 16050 - Basic Electrical Requirements
G. Section 16500 - Lighting
H. Section 16910 - Control Panels

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Preparation, handling, and installation shall be in accordance with the manufacturer's written instructions and technical data particular to the product specified or approved.

C. Coordinate and cooperate the installation with other trades.

D. Work will conform to the National Electrical Contractor's Association Standard of Installation for general installation practice.

PART 2 PRODUCTS

2.01 LISTINGS

A. Provide Underwriter's Laboratories (UL) listed and labeled equipment for all items for which UL carries a listing of labeling, unless items are specifically exempted.

2.02 MANUFACTURERS

A. Furnish all materials shown on the Contract Drawings and described in this Section. Provide specification grade materials, brand new, and bearing the UL label.

B. Product options and substitutions for specified materials in this Section shall be in accordance with Section 01630.

C. Acceptable Equipment Manufacturers for

1. Conduit and Conduit Fittings

   a. National Electric Products Corporation
   b. Republic Steel Corporation
   c. Killark Electric Manufacturing Company
   d. Steel City
   e. Thomas and Betts
   f. Carlon
   g. Appleton
   h. O.Z. Gedney
   i. Crouse-Hinds
   j. Robroy Signal Cable

2. Wire and Cable (600V)

   a. American Electric Cable Company
   b. General Wire and Cable Corporation
   c. Okonite Company
   d. Rome Cable Corporation
   e. Simplex Wire and Cable Company
   f. Carol Cable Company
   g. Royal Electric

3. Solderless Lugs and Grounding Connections

   a. Burndy Engineering Company, Inc.
   b. O.Z. Gedney Company, Inc.
   c. Penn Union Electric Corporation
   d. Thomas and Betts Company, Inc.
   e. Ilisco

4. Pull Boxes, Gutters, and Special Cabinets

   a. Square D Company
   b. Hoffman
   c. Circle A-W Products

5. Outlet Boxes

   a. Appleton Electric Company
   b. Killark Electric Manufacturing Company
   c. Lew Electric Fitting Company
   d. National Electric Products Corporation
   e. Steel City Electric Company
   f. Carlon
   g. Crouse-Hinds

6. Wiring Devices

   a. Leviton
   b. Arrow-Hart
   c. Harvey Hubbel, Inc.

d. Pass and Seymour, Inc.
e. Sierra Electric Company
f. Bryant

7. Conduit Racks, Hangers

a. Kindorf
b. Super Street
c. Unistrut
d. O.Z. Gedney
e. Robroy
f. Steel City

8. Remote Control Contractors

a. ASCO
b. Square D
c. General Electric
d. Westinghouse

9. Safety Switches (Disconnect and Fusible)

a. Square D Company
b. General Electric Company
c. Westinghouse Electric Corporation

10. Fuses

a. Bussman Manufacturing Company
b. Chase-Shawmut Company

11. Switchboard, Panelboards

a. Westinghouse Electric Corporation
b. Square D
c. General Electric
d. Industrial Electric Manufacturing
e. Electrical Power Products
f. Cutler Hammer
g. ITE

12. Transformers

a. Square D (Sorgel)
b. General Electric
c. Westinghouse Electric Corporation
d. HEVI-DUTY

13. Circuit Breakers

a. Westinghouse Electric Corporation
b. General Electric
c. Square D

14. Motor Control Centers

    a. Square D
    b. Furnas
    c. Allen-Bradley
    d. General Electric
    e. Westinghouse
    f. Cutler Hammer

15. Motor Controls

    a. Square D
    b. Furnas
    c. Allen Bradley
    d. Cutler-Hammer
    e. Sprecher & Schuh

16. Motors

    a. General Electric
    b. Reliance Electric
    c. Baldor Electric
    d. Lincoln

2.03 CONDUIT

A. General:

1. Each length of conduit shall bear the UL label.
2. Minimum acceptable conduit size is 3/4 inch for power and control, security, intercom, fire alarm, computer, and 1 inch for telephone and telecommunication, unless otherwise shown on the Contract Drawings.

B. Rigid Steel Conduit:

1. Rigid Steel Conduit: Full weight, pipe size, finished inside and out by hot-dipped galvanizing, and made to American National Standards Institute (ANSI) and UL requirements.
2. Couplings: Electroplated, cast, malleable iron.
3. Insulating Bushings: Threaded polypropylene or thermosetting phenolic, rated 150 degrees Centigrade (·C) minimum.
4. Insulated Grounding Bushings: Threaded, cast malleable iron body, with insulated throat and steel "lay-in" ground lug with compression screw.
5. Insulated Metallic Bushings: Threaded, cast, malleable iron body with plastic insulated throat rated 105·C minimum.
6. Running threads are not acceptable.

C. Polyvinyl Chloride (PVC) Conduit:

1. Conduit: UL-listed, Schedule 40 PVC conduit manufactured to National Electrical Manufacturer's Association (NEMA) TC-2. Other constructions are not acceptable.
2. Fittings: Provide couplings and connectors made by the same manufacturer as the conduit and joined with the recommended cement. Terminate PVC conduits with connectors or end bells.

D. PVC-Coated Rigid Conduit:

1. Conduit: Full weight, pipe size, finished inside and out by hot-dipped galvanizing, having an extruded 40-mil PVC jacket and a red urethane interior coating.
2. Fittings: Provide 40-mil PVC over-lapping pressure-sealing sleeves on couplings and conduit bodies to create tight, pressure-sealed joints. Interior surface shall have a red urethane coating.

E. Liquid-Tight PVC Flexible Conduit:

1. Conduit: Spiral-wound galvanized steel strip with an extruded PVC jacket; UL-listed Type UA/LA.
2. Fittings: Cast, malleable iron dip or mechanically galvanized finish, with insulated throats.

F. Wireway System:

1. Provide Joint Industry Conference (JIC) lay-in type wireway, without knockouts, manufactured to UL 870 standards.
2. Use slip-in type connectors that allow lay-in of all conductors.
3. Use fittings and accessories, made by the same wireway manufacturer, that are UL labeled in accordance to UL 870 standards.
4. Wireway Finish: Factory-applied gray epoxy enamel, applied to both inside and outside surfaces, over a corrosion-resistant phosphate primer.

G. Substitutions:

1. Other wiring systems may be used only as specifically approved by the ENGINEER in accordance with Section 01630.

2.04 WIRE AND CABLE

A. General:

1. All wire and cable shall be new and bear the UL label.
2. Use stranded copper wire.
3. Provide 600 volt (V)-rated wire and cable for the secondary power distribution system. Use type THWN/THHN above grade and type XHHW below grade.
4. Minimum Conductor Sizes:
   a. Power and Lighting Branch Circuits: No. 12 American Wire Gauge (AWG)
   b. Signal and Control Circuits over 100 V: No. 14 AWG.
   c. Low Voltage (50V or less): No. 16 or specified cables.

B. Color Coding:

1. Identify conductors as to phase connections by means of color-impregnated insulation or approved color-marking tape as follows:

	120/240	480Y/277
A Phase	Black	Brown
B Phase	Red	Orange
C Phase	Blue	Yellow
Neutral	White	White w/Black Stripe

	120/240	480Y/277
Ground	Green	Green

2. Motor Power Conductors: Black
3. Field Wiring, Motor Control Conductors:

Start	Blue
Stop	Red
Common	Yellow
Misc. Control	Orange

4. Control Panel Conductors:

Line, load, and control circuits at line voltage	Black
AC control circuit at less than line voltage	Red
DC control circuit	Blue
Interlock control circuits supplied from an external power source	Yellow
AC common	White
DC common	Gray
Ground	Green

5. Wire Delta - Connected Secondary High-Leg: Orange

2.05 INSTRUMENT CABLE

A. General:

1. Provide UL-approved cable for Class 2 or 3 power-limited circuits.
2. Use stranded shielded cable having a drain wire.
3. Rated 600VAC, 90°C dry/75°C wet, single pair/triad instrument or thermocouple cable.
4. Minimum Conductor Sizes: Individual cables shall be No. 16 AWG.
5. All cable shall be new and have the UL label marked on the jacket.

B. Color Coding:

1. Identify conductors regarding polarity connections by color-impregnated insulation or approved color-marking tape as follows:

	Positive ()	Negative (-)	Common
Instrument/Alarm	White	Black	
RTD	White	Black	Red
Thermocouple - EX	Violet	Red	
Thermocouple - JX	White	Red	
Thermcouple - KX	Yellow	Red	

2.06 WIRING DEVICES

A. Receptacles: Provide devices designed for extra-hard use in industrial applications and UL-listed specification grade. Use 20 amp (A), 125V-rated devices. Furnish other special receptacles as otherwise noted or detailed on the Contract Drawings.

B. Switches: Provide devices designed for extra-hard use in industrial applications and UL-listed specification grade. Use 20A, 120-277V-rated devices.

C. Ground Fault Circuit Interrupters (GFCI): Provide 20A, 120V devices conforming to NEMA 5-20R and UL-listed. Use feed-through type device having 5 mA trip threshold and trip time of 0.025 seconds.

D. Device Color: Use ivory for normal power; black for normal-power-dedicated circuits; and red for stand-by or emergency power systems.

2.07 DEVICE COVERS

A. Use galvanized sheet metal or raised covers for plant, process, or unfinished areas. Device plates shall completely cover outlet opening. Sectional device plates are not acceptable.

B. Provide a laminated plastic engraved label, indicating circuit number, on each device cover. Use white letters on black background for normal power and black letters on red background for stand-by or emergency power systems. Attach plastic label to cover plate using an epoxy adhesive. Dymo labeling will not be acceptable.

C. Provide die-cast aluminum covers, with spring door and gasket, for outdoor areas.

2.08 BOXES AND FITTINGS

A. Sheet-Metal Pull and Junction Boxes: Provide NEMA 4 enclosures for large pull or terminal boxes.

B. Cast Device Boxes: Provide FS/FD Feraloy with zinc-electroplate finish. Provide Feraloy covers and neoprene gaskets.

2.09 WIRE CONNECTIONS

A. Wire Joints:

1. Join wires in sizes from No. 18 to No. 8 AWG conductor, insulation rated 105 °C or less, with electrical spring connectors of three-part construction incorporating a non-restricted, zinc-coated steel spring enclosed in a steel shell having an outer jacket of vinyl plastic with a flexible insulating skirt. Self-stripping pigtail and top connectors are not acceptable.
2. Join wire sizes No. 6 and larger with solid copper split-bolt connectors torqued to the proper value and taped, or with properly insulated copper compression connectors installed according to the manufacturer's instructions.
3. Wire Connections Made on Platforms, Conveyor Systems, and Other Vibrations Equipment: Nylon, self-insulated crimp on wire joints; T&B Series RC & RP.
4. Motor Leads: Join wires using 3M-series 5300 pigtail or in-line splicing kit.
5. Conductors Subject to Moisture: Use 3M Scotchcast-series 82-BFI splicing kit for power and series; 72-N splicing kit for signal or control conductors.

B. Splicing and Insulating Tape (600V and below): For general-purpose electrical tape, use black 7-millimeter vinyl tape, ultraviolet-proof and suitable for temperatures from minus 18 °C to 105 °C.

C. Labeling Wires:

1. Branch Circuits: All wires in main J-boxes shall have circuit number tags. Use self-adhesive white tapes with black numbers.
2. Control Conductors: White PVC-shrink sleeve marker with printed (black) wire number (e.g., M560-10).

2.10 MOTORS AND CONTROLLERS

A. Motors:

1. Use high quality, extra-severe duty, energy-saving-type motors only.
2. Features: Expected minimum bearing life of 50,000 hours; dual-rated service factors of 1.15 at 40·°C ambient or 1.0 at 65·°C ambient; temperature; class F insulation shall be nonhydroscopic; cast iron construction; Stainless Steel nameplate; two (2) coats of epoxy enamel paint; same size bearing on drive-end and opposite drive end; gasketed conduit box with ground lug; built-in lifting lugs; totally enclosed, fan cooled (TEFC) enclosure, unless otherwise specified on the Contract Drawings.
3. Provide NEMA B design for normal starting torque applications (fans, blowers, rotary pumps, unloading compressors, and miscellaneous machinery). Provide NEMA C design for high-inertia starting loads (large centrifugal blowers, fly wheels and crusher drums) and for loaded starts (piston pumps, compressors and conveyors).
4. Operating Voltages: Provide motors that operate at 277-480VAC, 3-Phase.
   a. below 1/2 horsepower (HP), nonreversing 115V, 3-Phase
   b. 1/2HP and larger 277-480V, 3-Phase
5. Refer to detailed equipment specification for mounting, speed, enclosure, and other electrical and mechanical requirements.

B. Starters:

1. Magnetic Starters: Furnish full-voltage individual starter as shown on the Contract Drawings. Use minimum NEMA Size 1 unless otherwise shown. Equip overload relays with temperature-compensated bimetal heaters. Use "quick trip" heaters for submersible pump applications. Provide a NEMA 1 or 4 enclosure as specified on the Contract Drawings. Enclosure shall have an overload relay reset button. Manual motor starters may be used where start/stop remote control is not required.
2. Combination Starters: Furnish starters as specified. Provide branch circuit protection by using motor circuit protectors. Equip with control power transformer unless shown otherwise on the Contract Drawings. Provide auxiliary control power disconnect switch.
3. Manual Motor Starters: Provide fractional horsepower manual starters having double-break silver contacts, snap-action mechanism, trip free melting alloy overload, corrosion-resistant hardware and compact construction. Furnish with NEMA 1 or 4 enclosure as shown on the Contract Drawings.

C. Control Stations: Provide heavy-duty oil-tight control stations as shown on the Contract Drawings. Use rugged NEMA 4 enclosures.

D. Control Devices: Provide 10A machine-tool control or time-delay relays as shown on the Contract Drawings. Equip control relays with convertible contacts and provide each relay with at least one spare contact. Furnish NEMA 1 or 4 enclosures as shown on the Contract Drawings.

2.11 SAFETY SWITCHES

A. Provide safety switches of heavy-duty type, HP-rated, quick-make and quick-break design, externally operated with provision for padlocking, fusible or nonfusible as shown on the Contract Drawings.

B. Provide for maintenance bypass of cover locking system.

C. Provide NEMA 4X enclosure clearly marked on the exterior for maximum voltage, current, and horsepower rating.

D. For switches having dual ratings (higher rating when used with dual-element fuses), provide ratings indicated on a metal plate riveted, or otherwise permanently fastened, to the enclosure.

2.12 ENCLOSED CIRCUIT BREAKERS

A. Provide thermal magnetic circuit breakers in NEMA 1 or 4 enclosures as shown on the Contract Drawings. Minimum RMS symmetrical ampere capacities: Provide 18,000A at 277-480V unless otherwise shown or specified.

2.13 ELECTRICAL SUPPORTING DEVICES

A. Concrete and Masonry Fasteners:

1. Concrete: Helti HSL expansion anchors for 1/2 inch and larger bolts; Helti sleeve anchor for 3/8 inch and smaller bolts.
2. Masonry Block: Helti sleeve anchors.

B. Conduit Straps: Hot-dip galvanized, cast, malleable iron, one-hold-type strap with cast clamp-backs and spacers as required.

C. Construction Channel: 1-1/2 inch by 1-1/2 inch 12-gauge hot-dipped galvanized or "Galv-Krom" finished steel channel with 17/32-inch-diameter bolt holes, 1-1/2 inch on center.

D. Hanger Rods: Threaded hot-rolled steel; electroplated or cadmium plated; 3/8 inch minimum diameter; 1/2 inch diameter, conduit sizes 2-1/2 to 3-1/2 inches; 5/8 inch diameter, larger conduits.

E. Fasteners: Wood screws for fastening to wood; machine screws for fastening to steel; toggle bolts or "molly" bolts for fastening to hollow concrete block (1/4 inch or smaller), gypsum board, or plaster walls; expansion anchors for attachments to cast-in-place or precast concrete.

2.14 IDENTIFYING DEVICES

A. Nameplates: Provide engraved laminated nameplates, 1-inch by 3-1/2-inch minimum, machine screw retained, for permanent identification of all panelboards, motor starters, and cabinet-enclosed apparatus. Color shall be white with black letters. Panelboard numbers shall be inside the panel door. Refer to Section 16050 for nameplate construction and letter sizes.

B. Wire and Terminal Markers: Provide self-adhering, preprinted cloth or vinyl wire markers for general branch circuit systems. Use shrink-sleeve markers for control and instrument systems.

2.15 MOTOR CONTROL CENTERS (MCCs)

A. General:

1. MCCs are to consist of one or more enclosed vertical sections attached together to form a rigid, free-standing assembly. Provide components made by the MCC manufacturer. MCC construction to meet UL 845 requirements.

B. Service:

1. Provide 277-480V, 3-Phase, 3-Wire units unless shown otherwise. Refer to Contract Drawings for current ratings.

C. Structure:

1. Structure interrupting rating. Provide 42,000 RMS symmetrical amps unless shown otherwise.
2. Structure wiring to comply with NEMA class II, Type B wiring standards.
3. Structure to consist of one or more 20 inches wide by 20 inches deep by 90 inches high sections bolted together to form a NEMA 1A assembly. Install MCC in a NEMA 3R non-walk-in structure. Structure depth to match the incoming and distribution equipment depths.
4. Make provisions for bus extensions at both ends.
5. Provide MCC with horizontal wiring compartments at top and bottom. Wiring compartments to be isolated from bussing. Incoming line compartment to be front accessible and isolated from main bus or other compartments. Provide hinged vertical wiring compartment for each control section. Isolate vertical wireway from compartments.

D. Finish:

1. Paint all steel parts using an UL listed light gray baked enamel ANSI paint over a corrosion-treated surface. Do not paint surfaces used for ground connections.
2. Paint the NEMA 3R structure using light gray epoxy enamel paint over a corrosion-treated surface.

E. Bussing:

1. Provide tin-plated copper bussing. Isolate bus bars from unit compartments and wireways.
2. Provide full length nonplated copper ground bus; 1/4-inch by 2-inch minimum with conductor lugs.

F. Unit Compartment

1. Provide individual front door for each compartment. Mechanically interlock compartment door with unit disconnect device to prevent unintentional application of device for application of power while door is open.
2. Provide disconnect padlocking provision for at least 3 padlocks.

G. Combination Starter Units:

1. Furnish FVNR, FVR, RVNR, with closed transitions, or multispeed, and integral motor circuit protector as shown on the Drawings or the MCC Schedule. Provide minimum NEMA Size 1 starters. Equip each starter unit door with an overload relay reset button. Furnish overload relays with temperature-compensated bimetal heater elements. Use "quick trip" heaters for submersible pump applications. Size heater elements to the motor nameplate current rating data.
2. Combination starter units are to have a minimum 25,000 RMS symmetrical amp rating.
3. Provide at least one spare NO and one NC auxiliary motor contact with individual starter units.
4. Equip combination starter units with individual control power transformers. Provide overcurrent protection on both the primary and secondary sides of the transformer.

H. Branch Circuit Protection:

1. Provide Motor Circuit Protectors (MCPs) for motor branch circuit protection. Use thermal-magnetic type breakers for compartments without starters. MCP and thermal-magnetic breakers to have a minimum 25,000 RMS symmetrical amp rating at 277-480V.

I. Control:

1. Furnish a "HAND-OFF-AUTO" selector switch and red motor running light on each combination starter compartment door unless shown otherwise on the drawings.
2. Provide 10A machine tool control and time delay relays as required or as shown on the Contract Drawings. Provide each relay with at least one spare contract. Locate relays in separate compartment. Do not install in the individual combination starter compartment.

J. Blower Surge Protection

1. Provide a solid state self contained meter relay unit for the blower surge protection system.
2. Features

   a. Any variable can be converted to an analog current input.
   b. Input signal continuously displayed on the meter.
   c. DPDT relay that is energized to effect on/off low set point control.
   d. 4 1/2-inch rectangular size.

3. Coordinate special scale range and current transformer sizing with the blower manufacturer.
4. Provide LFE meter series meter-relay unit or acceptable alternate.

2.16 DISTRIBUTION EQUIPMENT

A. Combination Meter/Main

1. Provide factory assembled combination meter/main as shown in the Contract Drawings, complying with all NEC, utility, and local code requirements.
2. Provide underground pull section and utility metering compartment in accordance to local electric utility company requirements for 100A 480Y/277V 3PH 4W services.
3. Provide copper busing and full size neutral bus. Include copper ground bus.
4. Finish using gray baked enamel electrodeposited over cleaned phosphatized steel surface.

2.17 CONCRETE VAULTS, SPLICE BOXES, AND HANDHOLES

A. Provide pre-cast boxes with pulling inserts, counting channels, knockouts and extensions as shown on the drawings.

B. Utility power and telephone company pull and splice boxes: Comply to utility company pre-cast box size and construction standards; provide their specified box accessories and grounding devices or products.

C. Provide spring-assisted (to open) galvanized steel diamond plate covers that identify box service; (e.g., ELECTRIC POWER, LIGHTING, TELEPHONE), or as otherwise noted on the Contract Drawings. Furnish covers and locking latch and designed for their location loading requirements: (e.g., full traffic, light vehicular traffic, or pedestrian traffic).

D. Furnish 6-inch diameter (minimum) sump for boxes having a concrete base (or floor).

2.18 AUTODIALER

A. Provide an alarm monitoring panel, ADEMCO Model 4110 or approved equal (Cecil's Security, 209.948.6140), to allow automatic telephone communication of up to six alarm signals to a remote alarm monitoring company. Provide connections to relay dry contacts in blower, condensate, and flare controls, as shown in the equipment manufacturer's shop drawings. Coordinate with OWNER's alarm monitoring company (Cecil Security) to

initiate continuous alarm monitoring, notification, and dispatch service upon start up of continuous operation of LFG control system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Notify the OWNER and the ENGINEER of such conditions and proposed corrective actions before correcting unsatisfactory conditions. Do not proceed until unsatisfactory conditions are corrected.

3.02 CONDUIT AND RACEWAY INSTALLATION

A. Applications:

1. Rigid Steel Conduit: Exterior above grade power and lighting branch circuits; interior power and lighting branch circuit in machine or process operations areas.
2. Liquid-Tight Flexible Metallic Conduit: In damp and wet locations, in other locations for connections to all pump motors, solenoid valves, transformers, vibrating equipment, and similar devices.
3. PVC Conduits: Schedule 40 PVC may be used underground with 3 inches of sand under and 6 inches of sand over, or may be used encased in concrete. Minimum earthfill cover shall be 24 inches. Multiple PVC conduits will be installed using approved spacers at intervals not exceeding five (5) feet.
4. PVC-Coated Rigid Steel Conduit: Exterior power and lighting branch circuits in direct contact with earth, concrete, constant moisture or subject to damage from corrosives (Schedule 40 PVC preferred for underground and in-slab wiring).

B. General:

1. Route concealed conduits as directly as possible and provide large radii bends. Rigidly secure conduit in position by means of approved clamps.
2. Plan conduit routing before installation and coordinate with other construction. Install conduits so they do not prevent removal, nor block access to mechanical or electrical equipment.
3. Install exposed conduits straight and true with reference to the adjacent work.
4. Support vertical conduit runs.
5. Running threads and threadless couplings are not acceptable for rigid steel conduit. Where necessary for connecting rigid conduit, use UL-listed couplings or unions.
6. Long Runs of Conduit: Provide pull boxes every 200 feet unless otherwise shown on the Contract Drawings.
7. Provide a 100-pound tensile strength polyethylene pulling rope in empty conduits.
8. Install an insulated copper green grounding conductor in all control, branch circuit and feeder raceways.
9. Seal all conduits during construction with conduit plugs or "pennies" set under bushings.
10. Install seal-off fitting on all raceways that enter an enclosure from a below-grade location.
11. PVC Schedule 40 Slab Penetrations: Use PVC-coated rigid steel conduit or rigid steel conduit wrapped with rugged pressure-sensitive 20-mil PVC tap (Scotchwrap 51) for all slab penetrations or below-above grade transitions. Apply one coat of Scotchwrap pipe primer before taping the pipe.
12. Conduit joints shall be painted with Crouse-Hinds STL thread lubricant.
13. Conduit Installation for Machine or Process Operations Areas. Use FORM 7 conduits or FS/FD boxes, with cover and gasket, for all conductor pull outlets.
14. Install expansion couplings where any conduit crosses a separation or expansion joint.
15. Rigid Conduit Terminations: Use conduit hubs for outdoor locations.
16. Bond all metal conduits at free-standing enclosures to the ground bus using grounding bushings.

C. Underground Raceways:

1. Provide a minimum raceway slope of 3 inches, each 100 feet away from outdoor switchgear, and toward handholes or other electrical drainage points.
2. Stagger conduit joints by rows and layers to provide maximum raceway bank strength. Identify conduits, using their assigned conduit numbers or circuit designation, at handholes or other termination points.
3. During construction, protect partially completed conduits from mud, sand, dirt, or other debris by using plugs.
4. After an underground raceway bank is completed, pull a testing mandrel, not less than 12 inches long and having a diameter of 1/4 inch less than conduit diameter, through each conduit. Install a 150-pound pull rope in each conduit and leave at least 3 feet of slack at each end.
5. Provide no less than a 6-inch clearance from a conduit or raceway bank to each side, and 3-inch clearance to the trench bottom. Clean debris or loose dirt from trench bottom and provide a 3-inch sand base.
6. Provide a 3-inch wide red marking tape and install 12 inches above top of raceway. Tape to have "CAUTION - ELECTRIC LINE BURIED BELOW" printed continuously.

3.03 WIRING AND CABLE INSTALLATION

A. General:

1. Install conductors after conduit system is completed. Care will be taken in pulling conductors such that insulation is not damaged. Use UL-approved wire pulling lubricants as needed.
2. Install and test all cables in accordance with the manufacturer's requirements and warranty.
3. Before pulling conductors or cables, blow out all raceways with compressed air at 3,500 feet per minute velocity. In addition, below-grade raceways are to be swabbed out.
4. Use 10 AWG, minimum conductor size, for branch circuit homeruns greater than 100 feet.

B. Splicing and Terminating:

1. All aspects of splicing and terminating will be in accordance with the manufacturer's published procedures.
2. All splices in outlet boxes with connectors, as specified herein, will be made with separate tails of correct color. Provide at least 6 inches of tails packed in box after splice is made.
3. Neatly bundle and clamp all wire and cable in panels, control centers, and equipment enclosures.

C. Identification:

1. Identify branch circuit conductors with vinyl wrap-around markers. Where more than two conductors run through a single outlet, mark each circuit with the corresponding circuit number at the panelboard.
2. Identify size No. 6 and larger using phase color markers and identification tags.
3. Provide vinyl marker tape for all terminal strips.

D. Connections to Circuit Breakers, Switches, and Terminal Strips, Stranded Copper Conductors:

1. No. 12 through 8 AWG: Terminate using locking-tongue style, compression-type lugs, or by connectors supplied by the manufacturer.

E. Joints in Wires in Dry Locations, Copper Conductors:

1. No. 8 AWG and Smaller: Use cap or twist-on, spring-type solderless connectors. Self-stripping tap connectors shall not be acceptable.
2. No. 6 AWG and Larger: Use split-bolt connectors or compression sleeves. Insulate joints with rubber tape and protected with half-lapped layers of vinyl-plastic electrical tape. Insulation may also be provided by UL-listed pre-manufactured components such as heat-shrink or cold-shrink devices.

F. Joints in Wires in Moist Locations, Copper Conductors: Secure as specified above, then encapsulated in epoxy (Scotchcast or approved equal).

G. Grounding:

1. Permanent Ground Enclosures of Equipment, Raceways, and Fixtures: Install a copper-insulated green equipment grounding conductor in all branch circuit and feeder raceways. Equipment ground shall originate at panelboard ground bus and be bonded to all outlet boxes and electrical equipment enclosures. Connect receptacle ground terminals to the equipment grounding conductor by an insulated copper conductor.
2. Panelboards Having Multiple-Ground Buses: Buses are to be bonded together by using 6 AWG (minimum) conductor; using panelboard interior support structure as a bonding medium is not acceptable.

H. Signal Wiring:

1. Identify wire used for alarm and control signal applications at both ends and referenced to appropriate Record Drawings. Refer to Section 01720 for additional information.
2. Identify control wiring in accordance with record control diagrams.

3.04 CONCRETE VAULTS, SPLICE BOXES, AND HANDHOLES

A. Do not locate boxes in roadways or within landfill waste limits unless specifically approved by the ENGINEER.

B. Make all precast joints walls, risers, and conduit entrances watertight using cement grout or sealant. Use cement grout consisting of two parts sand and one part cement and sufficient water to form a plastic slurry. Apply in a manner to insure filling of all joint voids and conduit entrances.

C. Excavation and bedding: Excavation must allow for overall assembled height of boxes plus added height of risers and bedding material consisting of 6-inch compacted sand or gravel. Provide an minimum 4 inch clearance around the box exterior walls.

D. Setting: Assemble boxes by lowering each section into the excavation. Lower, set and level base sections in place. The seal surfaces between sections must be cleaned and have gaskets in place before placing next section. Excavation hole must not contain water when setting the box.

E. Backfilling: Provide compactible material such as pea gravel or sand. Not acceptable to use material such as saturated soil or material containing large rocks or chunks. Backfill after box completely installed and compact progressively from the bottom to the top surface. Provide minimum 3-inch layer of hydrated bentonite at the bottom of all boxes, to reduce landfill gas intrusion.

3.05 ELECTRICAL TESTING

A. General:

1. Provide all materials, supplies, tools, equipment, labor, and services required to perform all tests as specified in this Section.
2. Submit test reports for approval by the ENGINEER.
3. Correct all deficiencies revealed by tests. Replace at CONTRACTOR's cost, all materials and equipment found faulty.
4. CONTRACTOR shall furnish the services of an independent electrical testing firm acceptable to the ENGINEER to conduct all testing. CONTRACTOR may perform low-voltage wire and cable meggering.
5. Maintain a written record of all tests showing date, personnel making test, equipment or material tested, tests performed, manufacturer and serial number of testing equipment and results.
6. CONTRACTOR shall be responsible for any damage to equipment or material due to improper test procedures or test apparatus handling, and shall replace, at his cost, or restore to original condition any damaged equipment or material.

7. It is the intent of these tests to assure that all electrical equipment, both CONTRACTOR and OWNER supplied, is operational within industry and manufacturer's tolerances and is installed in accordance with design specifications.
8. The tests and inspections will determine the suitability for energization.
9. The InterNational Electrical Testing Association (NETA) guidelines are to be used for the testing procedures and acceptance tests values of results.

B. Work Included:

1. Test all wire, cable, equipment, and systems installed or connected under electrical contract to assure proper installation, setting, connection, and functioning in accordance with the Contract Drawings, Specifications, and the manufacturer's recommendations. The intent is that field testing be extensive and complete as specified, to provide assurance of correct installation and operation of equipment.
2. Perform all tests and inspections recommended by the equipment manufacturer, whether required by these Specifications or not, unless specifically waived by the ENGINEER.
3. Tests shall include, but are not limited to, the following:

   a. All Wiring: Free of shorts, unintentional, and grounds.
   b. Molded Case Breakers, 150A and Larger: Time and instantaneous tripping, physical condition, contact resistance, insulation resistance.
   c. Power Circuit Breakers: Calibration to time/current curves, physical condition, contact resistance, insulation resistance.
   d. Grounding System: Ground resistance (impedance), ground integrity.
   e. High voltage cable.
   f. Motor Controls: Proper overload sensing, insulation resistance.
   g. Ground Fault System: Neutral free of improper grounds, pick-up, coordination, zone interlocking. Submit certified test report to the ENGINEER.
   h. Protective Relays: Pick-up, timing, insulation resistance, physical condition.
   i. Switchboards, Panelboards, Bus Ducts, etc.: Insulation resistance, physical condition, proper torque on connections.
   j. Feeder Cables and Motor-Branch Power Conductors: Insulation resistance.
   k. Motors: Proper rotation, insulation resistance.

C. Minimum Acceptable Test Results:

1. Ground System: The main ground electrode system resistance to ground no greater than 5 ohms.
2. Electrical Apparatus and Systems Insulation Resistance:

Maximum Voltage Rating of Equipment	Minimum Test Voltage D.C.	Minimum Insulation Resistance in Megohms
250	500	25
600	1,000	100
5,000	2,500	1,000
8,000	2,500	2,000
15,000	2,500	5,000
25,000	5,000	20,000

3. Low Voltage Cables (600V maximum):

Maximum Voltage Rating of Equipment	Minimum Test Voltage D.C.	Minimum Insulation Resistance in Megohms
300	500	2
600	1,000	2

3.06 PROTECTION

A. General: Conduits, junction boxes, outlet boxes, and other openings shall be kept closed to prevent entry of foreign matter. Cover fixtures, equipment, and apparatus for protection against dirt, paint, water, chemical or mechanical damage, before and during the construction period. Restore damaged fixtures, apparatus, or equipment to original condition prior to final acceptance, including restoration of damaged shop coats of paint at no additional cost to the OWNER. Protect brightly finished surfaces and similar items during construction. No rust or damage will be permitted.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable items in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 16500
LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Supplying and installing high-power sodium (HPS) lighting fixtures and associated ballasts and lamps as indicated on the Contract Drawings to construct a complete workable security lighting system.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 - Product Options and Substitutions
D. Section 01720 - Project Record Documents
E. Section 16050 - Basic Electrical Requirements
F. Section 16100 - Basic Electrical Materials and Methods

1.03 REFERENCES

A. Illuminating Engineering Society (IES) Standard 90A Energy Conservation in New Building Design

1.04 SUBMITTALS

A. Product Data: Submit the following at least 14 days before shipment of materials to the Site.

1. Catalog cuts of all lighting fixtures including construction details, photometric data, and Electrical Testing Laboratories (ETL) and Independent Testing Laboratories (ITL) test reports.
2. Catalog cuts of lamps and lenses.

1.05 QUALITY ASSURANCE

A. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver all material to the site in the original packaging.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Furnish all materials indicated on the Contract Drawings and in this Section. Provide specification grade materials that are brand new and bear the UL label.

B. Product options and substitutions for specified materials in this Section shall be in accordance with Section 01630.

C. Acceptable Equipment Manufacturers for:

1. Lamps and Tubes

    a. General Electric Company
    b. Sylvania Electric Products, Inc.
    c. Westinghouse Electric Corporation

2. High-Intensity Discharge (HID) Lighting

    a. General Electric
    b. Holophane
    c. Hubbell
    d. Crouse-Hinds
    e. Appleton

3. Ballasts

    a. Advance Electric Company
    b. General Electric Company
    c. Universal

2.02 FIXTURES

A. All fixtures shall be listed by UL.

B. Lighting fixture manufacturer's catalog numbers are indicative of desired design, appearance, quality, and performance.

C. Construction: One-piece aluminum assembly; silicon-rubber gasketing; tempered glass lens; Stainless Steel latch press; Corrosion - resistant and approved for marine locations.

D. HID fixtures shall be UL listed for 55°C operation.

2.03 BALLASTS

A. Provide high-power-factor-type ballasts, Class P, with internal thermal protection, and a sound rating bearing Certified Ballast Manufacturer's (CBM), ETL, and UL labels.

2.04 LAMPS

A. HPS: Provide clear mogul or medium based lamps.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Notify the OWNER and the ENGINEER of such conditions and proposed corrective actions before correcting unsatisfactory conditions. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Verify all mounting details and coordinate fixture trim and accessories before ordering fixtures.

B. Furnish and install all light fixtures as indicated on the Contract Drawings as new, and connect to wiring system.

C. Furnish and install lamps in all fixtures as indicated on the Contract Drawings.

D. Clean all fixtures and lenses prior to final acceptance of the Work by the OWNER.

E. Provide the concrete pole bases as shown on the Contract Drawings.

PART 4 MEASUREMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable items in the Bid Schedule, or incidental to the Contract.

END OF SECTION

SECTION 16910
CONTROL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Supplying and installing the electrical controls and wiring required for control panel fabrication.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01090 - References
C. Section 01630 - Product Options and Substitutions
D. Section 01720 - Project Record Documents
E. Section 01730 - Installation, Operation, and Maintenance Instructions
F. Section 11000 - Equipment
G. Section 16050 - Basic Electrical Requirements
H. Section 16100 - Basic Electrical Materials and Methods

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Furnish all materials indicated on the Contract Drawings and in this Section. Provide industrial grade materials that are brand new and bear the UL label.

B. Product options and substitutions for specified materials in this Section shall be in accordance with Section 01630.

C. Acceptable Equipment Manufacturers for:

1. Enclosures

a. Circle A-W Products
b. Hoffman
c. Weigman
d. Hammond

2. Motor Control

a. Square D
b. Furnas
c. Allen-Bradley
d. Cutler-Hammer
e. General Electric

f. Westinghouse

3. Control Devices

a. Square D
b. Furnas
c. Allen-Bradley
d. Time Mark
e. Eagle Signal
f. Electroswitch
g. Cutler-Hammer
h. General Electric
i. Westinghouse
j. IDEC
k. Sprecher & Schuh

4. Terminal Blocks

a. Phoenix
b. Weidmuller

2.02 ENCLOSURES

A. General: Enclosures shall be designed to house electrical and electronic controls, instruments, and components, and shall provide protection from dust, dirt, oil, and water.

B. Enclosures in wet or damp areas shall be NEMA 4X or Hoffman Bulletin A-4.

C. Enclosures in corrosive areas shall be NEMA 4X Fiberglass or Hoffman Bulletin A48 or A17.

2.03 NAMEPLATES

A. Nameplates will be laminated plastic; identify the control panel, control device, or instrument designation; and use 1/4-inch-high, black letters on white background, unless otherwise specified or detailed.

B. Provide control or instrument switches with an escutcheon plate that clearly identifies each operation position.

2.04 CONTROL DEVICES

A. General: NEMA 4X panel-mounted control devices shall be used in outdoor or other wet areas.

B. Control relays shall be heavy duty, machine tool, industrial-type relays, with 10A-rated contacts and at least one normally open/normally closed (NO/NC) convertible spare contact, Furnas Class 46.

C. Indicating lights shall be transformer type or LED, heavy-duty oil-tight units rated at 120V, Furnas Class 52.

D. Selector switches and push-buttons shall be heavy-duty oil-tight units and shall have the specified momentary or maintained 10A, 120V contacts, Furnas Class 52.

E. Control switches will be UL-listed and HP-rated cam-actuated selector switches with a 20A, 600V continuous current rating, Electroswitch Series PR20.

F. Time totalizers will be synchronous motor-driven, nonreset, six-digit-wheels, including a 1/10 digit on hours and minutes, rated NEMA 4 for damp or wet areas.

2.05 TERMINAL BLOCKS

A. General: Terminal blocks shall be NEMA rated, DIN-Rail type, molded out of polyamide or melamine plastic; metal parts will be stainless steel, cadmium, or zinc plated to inhibit corrosion; temperature service range shall be minus 40°C to 75°C. Provide screw-clamp terminals.

B. Terminals for 120V or less circuit shall be 30A, 600V rated terminals, Weidmuller WDU 4.

C. Terminals for 208V to 480V circuits shall be 55A, 600V rated terminals; Weidmuller WDU 16 series.

2.06 WIRE MARKING

A. General: White heat-shrink wire marker sleeves with black printed wire identification numbers shall be provided.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Notify the OWNER and the ENGINEER of such conditions and proposed corrective actions before correcting unsatisfactory conditions. Do not proceed until unsatisfactory conditions are corrected.

3.02 CONTROL PANEL INSTALLATION

A. General

1. Two coats of rust-inhibiting, light gray epoxy enamel paint shall be applied to control panel enclosures, excluding NEMA 4X. Paint shall be applied after device holes have been punched or cut out.
2. Wire groups shall be bundled using wire PAN-TYs or spiral wraps. Wire bundles shall be secured to the panel using machine screws. Provide plastic wiring duct for back panel wire bundles.
3. A barrier shall be provided to separate line voltage from low (24V or less) voltage systems. Isolate 480V terminals from control terminals.
4. Relay and other components shall be secured to the panel using machine screws. Self-tapping screws will not be acceptable.
5. Laminated plastic nameplates identifying control devices or components inside the enclosure shall be attached to the back panel using machine screws.
6. The panel fabricator shall operationally check the control panel, including the programmable control system, before shipment to the Site or installation as part of the packaged equipment.
7. Control wire sizes, types, and color coding shall be installed in accordance to Section 16100.

B. Record Documents:

1. Comply with the pertinent provisions of Section 01720.
2. Control panel shall be equipped with final record schematic and wiring diagrams or programmable controller program printout, ladder diagram type.
3. Record documents shall be stored in a heavy-duty clear plastic envelope and secured to the interior back panel or door of the control panel.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Separate measurement for payment will not be made for work or materials specified in this Section.

4.02 PAYMENT

A. Separate payment will not be made for work or materials specified in this Section. All costs associated with the requirements of this Section will be considered subsidiary to the applicable items in the Bid Schedule, or incidental to the Contract.

END OF SECTION

NOTICE TO CONTRACTORS

Contractors are invited to submit written, formal bids for

LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION AT THE FINK ROAD LANDFILL

Bids envelopes must be delivered to the Clerk of the Board of Supervisors, Tenth Street Place, Joint Stanislaus County/City of Modesto Administration Building, 1010 10th Street, Suite 6700, Modesto, CA, located on the Sixth Floor of Tenth Street Place, **PRIOR TO 2:45 P.M. ON JUNE 27, 2001**, as evidenced by the date/time stamp on the envelope by the Clerk. After bid opening, the bids will be publicly opened and read by the Clerk in the Lobby Conference Room No. 6709, located on the Sixth Floor of Tenth Street Place.

Bids shall be submitted in sealed envelopes on the forms provided with the plans and specifications for that purpose. Envelopes shall be addressed to the Clerk of the Board of Supervisors, Tenth Street Place, Joint Stanislaus County/City of Modesto Administration Building, 1010 10th Street, Suite 6700, Sixth Floor, Modesto, CA 95354, and plainly marked:

"LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION"

The work consists of construction of the Landfill Gas Collection and Control System and includes a site preparation for the construction of the Blower/Flare Facility. Construction of vertical landfill gas extraction wells, installation of landfill gas collection and control system piping, blower/flare facility, condensate collection, and disposal system.

Proposal, Plans, and Specifications are available at the Department of Public Works Office, 1716 Morgan Road, Modesto, CA 95358, upon the receipt of $10.00 **(NON-REFUNDABLE)** fee (make checks payable to: "STANISLAUS COUNTY PUBLIC WORKS") during the office hours of 7:30 a.m. to 12:00 p.m. and from 1:00 p.m. to 5:00 p.m., Monday through Friday. For any questions, please call the Public Works, **ENGINEERING DIVISION AT (209) 525-4193**. For **technical questions**, please contact Michael Franck at the Public Works, Fink Road Landfill Division, County of Stanislaus, Crows Landing, CA at (209) 837-4804.

Your particular attention is directed to the "Information for Bidders" and "General Conditions" included in the specifications, which is to be followed in all respects. In particular, your attention is directed to the handicapped, non-discrimination clause contained in the General Conditions, Section 2.47, which complies with Section 504 of the Rehabilitation Act of 1973. A bidders bond or its equivalent will be required.

Pursuant to Sections 1770 and 1773 of the Labor Code, the Board of Supervisors has ascertained the general prevailing rate of per diem wages applicable to the work to be done for straight time, overtime, Saturday, Sunday, and holiday work. These wage rates are set forth by the Director of the Department of Industrial Relations now on file with the Department of Public Works, and which are a part of the contract.

By order of the Board of Supervisors of the County of Stanislaus, State of California made and entered this June 5, 2001.

ATTEST CHRISTINE FERRARO TALLMAN
Clerk of the Board of Supervisors of the
County of Stanislaus, State of California

By _____
Assistant Clerk

DECLARATION OF PUBLICATION
C.C.P. S2015.5)

COUNTY OF STANISLAUS
STATE OF CALIFORNIA

I am a citizen of the United States and a resident Of the County aforesaid; I am over the age of Eighteen years, and not a party to or interested In the above entitle matter. I am a printer and Principal clerk of the publisher of **THE MODESTO BEE,** printed in the City of **MODESTO,** County of **STANISLAUS,** State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of **STANISLAUS,** State of California, Under the date of **February 25, 1951, Action No. 46453;** that the notice of which the annexed is a printed copy, has been published in each issue thereof on the following dates, to wit:

JUNE 13, 20, 2001

I certify (or declare) under penalty of perjury That the foregoing is true and correct and that This declaration was executed at **MODESTO,** California on

JUNE 20, 2001
(date)

(Signature)

NOTICE TO CONTRACTORS
Contractors are invited to submit written, formal bids for
LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTIONAT THE FINK ROAD LANDFILL

Bids envelopes must be delivered to the Clerk of the Board of Supervisors, Tenth Street Place, Joint Stanislaus County/City of Modesto Administration Building, 1010 10th Street, Suite 6700, Modesto, CA, located on the Sixth Floor of Tenth Street Place, PRIOR TO 2:45 P.M. ON JUNE 27, 2001, as evidenced by the date/time stamp on the envelope by the Clerk. After bid opening, the bids will be publicly opened and read by the Clerk in the Lobby Conference Room No. 6709, located on the Sixth Floor of Tenth Street Place.

Bids shall be submitted in sealed envelopes on the forms provided with the plans and specifications for that purpose. Envelopes shall be addressed to the Clerk of the Board of Supervisors, Tenth Street Place, Joint Stanislaus County/City of Modesto Administration Building, 1010 10th Street, Suite 6700, Sixth Floor, Modesto, CA 95354, and plainly marked:

'LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION'

The work consists of construction of the Landfill Gas Collection and Control System and includes a site preparation for the construction of the Blower/Flare Facility. Construction of vertical landfill gas extraction wells, installation of landfill gas collection and control system piping, blower/flare facility, condensate collection, and disposal system.

Proposal, Plans, and Specifications are available at the Department of Public Works Office, 1716 Morgan Road, Modesto, CA 95358, upon the receipt of $10.00 (NON-REFUNDABLE) fee (make checks payable to: 'STANISLAUS COUNTY PUBLIC WORKS') during the office hours of 7:30 a.m. to 12:00 p.m. and from 1:00 p.m. to 5:00 p.m., Monday through Friday. For any questions, please call the Public Works, ENGINEERING DIVISION AT (209) 525-4193. For technical questions, please contact Michael Franck at the Public Works, Fink Road Landfill Division, County of Stanislaus, Crows Landing, CA at (209) 837-4804.

Your particular attention is directed to the 'Information for Bidders' and 'General Conditions' included in the specifications, which is to be followed in all respects. In particular, your attention is directed to the handicapped, non-discrimination clause contained in the General Conditions, Section 2.47, which complies with Section 504 of the Rehabilitation Act of 1973. A bidders bond or its equivalent will be required.

Pursuant to Sections 1770 and 1773 of the Labor Code, the Board of Supervisors has ascertained the general prevailing rate of per diem wages applicable to the work to be done for straight time, overtime, Saturday, Sunday, and holiday work. These wage rates are set forth by the Director of the Department of Industrial Relations now on file with the Department of Public Works, and which are a part of the contract.

By order of the Board of Supervisors of the County of Stanislaus, State of California made and entered this June 5, 2001.

ATTESTCHRISTINE FERRARO TALLMAN
Clerk of the Board of Supervisors of the County of Stanislaus, State of California
By /s/ Lillie Farriester
Assistant Clerk
June 13, 20, 2001