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SECTION 15 PLANT START-UP AND ACCEPTANCE

15.0 PLANT START-UP AND ACCEPTANCE

The Buyer shall conduct startup and acceptance activities in coordination with the Seller to ensure that the new Facility is functioning properly prior to operation with the existing PLWTP and to meet all acceptance criteria for the processing of the digester gas from the PLWTP, as well as the criteria established by the Seller for interconnecting with required PLWTP utilities and the proper operation and control of all utilities, digester gas systems and waste gas flares.

15.1 GENERAL CONDITIONS – STARTUP AND ACCEPTANCE

15.1.1 Intent

The startup and acceptance testing is intended to ascertain whether the BUDG facility has met the Acceptance Standards and performance requirements without interference to the PLWTP operations and maintenance and to insure compliance with the APSB, Site Lease and SOW requirements. The Buyer shall operate the Facility to demonstrate the BUDG Facility performance in relationship to those conditions stipulated in the contract documents and this SOW and compliance with all permit conditions and regulations.

Tests will be conducted to demonstrate that the Facility meets:

- PLWTP Operational Requirements
- PLWTP Traffic Control Requirements
- Gas wasting operations for the PLWTP
- Electrical system operations
- Environmental conditions and Permits
- PLWTP Digester Gas System Operations

15.1.2 Definitions

15.1.2.1 Startup

Startup means the period of operations commencing with the first energizing of any new or additional equipment in the BUDG Facility, proceeding through sequential startup of each unit of equipment in accordance with the startup Protocol (to be determined by Buyer and approved by Seller (approval shall not be unreasonably withheld), and in keeping with good plant operating practice), and culminating with the acceptance tests as outlined below.

15.1.2.2 Initial Acceptance Tests

Initial acceptance testing encompasses the operation of the BUDG Facility to demonstrate it's ability to perform all intended functions, including proper and seamless integrated operation with the PLWTP facility, apart from the long-term demonstration of commercial operations.

15.1.2.3 Final Acceptance Tests

Final Acceptance testing consists of demonstrating the continued performance of the BUDG and associated operations over an extended period of time, under normal commercial operating conditions which will include normal variations in the quantity of digester gas available, variations in the ability of the BUDG to utilize the gas available, and without disruption to the operation of the PLWTP.

15.1.3 Requirements and Prior Conditions

The Buyer shall furnish all labor, supervision, equipment, instrumentation, and special services necessary to conduct the Startup and Acceptance tests. Additionally, the Buyer shall be solely responsible for all costs it incurs in undertaking the Startup and Acceptance Tests.

The Buyer shall coordinate Startup activities and Acceptance Testing with the Seller and the existing WWTP to assure that these activities do not adversely impact ongoing Seller's operations.

The Buyer is responsible for having adequate instrumentation to perform all tests required.

All Acceptance Tests shall be performed in accordance with the applicable local, State, and Federal regulatory agencies' rules, regulations, and methods, and any requirements of pertinent Sections of this Agreement.

At least thirty (30) days prior to the commencement of any Acceptance Tests to determine the ability of the Facility to satisfy the Acceptance Standards, the Seller shall be given notice in the form of a preliminary Acceptance Test Protocol, which will incorporate the guidelines established in this section and the Seller's previous comments. It will contain the Buyer's best estimate of the schedule and procedures of the Acceptance Tests. The Seller's shall provide comments within ten (10) days to the Buyer regarding the preliminary Acceptance Test Protocol. A final Acceptance Test Protocol acceptable to both the Seller and the Buyer must be issued five (5) working days prior to the start of any Acceptance Tests. The Buyer shall notify the Seller at least five (5) working days prior to the start of any Acceptance Test described herein.

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During the Acceptance Test period, all equipment, including that associated with air pollution control, normal and temporary loadout, control systems, gas collection, storage, compression, transportation and conditioning systems, if any, will operate at its various operating modes at design capacity to demonstrate the BUDG Facility will not have any significant negative operational, financial or maintenance impacts on the PLWTP. During the Acceptance Tests, the Buyer shall operate in conformance with SDAPCD requirements. The Acceptance Test will be conducted with all the utilities allowed operating as designed and per this Agreement and SOW. Test procedures may be required to occur concurrently, as directed by the Seller.

All metering devices requiring field calibration shall be calibrated immediately prior to the start of testing, in accordance with normal practices. At the end of the Acceptance Tests, the metering devices shall be recalibrated to determine if there was any change in accuracy. Sealed instruments that have been factory calibrated will not need calibration if within calibration dates. During start-up and shakedown operation of the BUDG Facility and before conducting the Acceptance Tests, any instrumentation and controls requiring field calibrations will be calibrated by technicians provided by the Buyer, its subcontractors, or suppliers. The Seller will be notified of and given the opportunity to witness the calibration of any instruments or control loops calibrated on site.

The Buyer shall communicate with the Seller on an on-going basis during the conduct of the tests regarding the nature and occurrence of all events and activities taking place. The Seller may witness any or all parts of the Acceptance Tests.

The Buyer shall maintain a record of all calibration checks and make such records available to the Seller, upon request.

15.2 STARTUP

The BUDG Facility will complete a start-up demonstration period during which the Facility will have been operated on Digester gas at or above 70 percent capacity to demonstrate mechanical completion of the BUDG Facility and to allow any required adjustments.

The Startup protocol (see 15.1.2.1) will include any Seller's comments in relationship to effects the startup may have on the PLWTP.

Prior to the start of Acceptance Testing, the Buyer shall complete the following:

15.2.1 Mechanical Completion

Comply with all provisions of the Agreement relating to the installation of equipment, components and systems necessary for the safe and stable operation of the appropriate system being tested (except for the completion of painting, final grading, and any other portion of the work not affecting the operability, safety, or mechanical or electrical integrity of the BUDG facility in accordance with the final plans and specifications).

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15.2.2 Operational Readiness

Verify that all equipment and systems are substantially and materially complete and ready for initial operation and may be operated in the manner in which they are normally intended to be operated without damage to any property and without injury to any person. Verification will include the completion of integrity tests such as hydrostatic and pneumatic pressure tests, high pot tests, insulation resistance and continuity test, calibration, clean-outs and flushes, and completed system start-up testing in accordance with approved procedures.

15.2.3 Punch List

Prepare a comprehensive punch list of all remaining work to be performed by both the Buyer and the Seller. The punch list shall identify the party responsible and a schedule to perform each task. The initiation of performance testing and achievement of the BUDG Facility acceptance shall not require completing of the punch list tasks, except to the extent that it will not relieve the Buyer of its obligation to complete such tasks.

15.2.4 Capacity Demonstration

Demonstrate that the BUDG process train will accept and process digester gas at 70% of design capacity for a 4 hour period.

15.2.5 Utility Performance

Demonstrate the proper operation of the Electrical System switchgear, safety interlocks (including EMO initiated by PLWTP), software modifications to the PLWTP's DCS for flare control, and other utility systems.

15.2.6 Truck Movement Test

Demonstrate that tube trailers can be readily and safely positioned at both normal and temporary Trailer Loading Facility.

15.2.7 Truck Loading Test

Demonstrate the successful loading of a tube trailer with BUDG product gas at both normal and temporary loadout facilities.

Having demonstrated and complied with the criteria and requirements stated above to the satisfaction of the Seller, the Buyer may begin Acceptance Testing.

15.3 INITIAL ACCEPTANCE TEST

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If any extraordinary adjustments or modifications, with the exception of normal maintenance and adjustment, are performed after the start-up period, the Seller may request start of Acceptance Tests to begin again.

The Buyer shall maintain records of the quantity and type of chemicals(s) used by the BUDG Facility for testing purposes. In addition, the Buyer shall maintain records of the hourly operation, including uptime, hourly thru put of the system, quantity of compressed Digester Gas and any waste products generated during each of the Acceptance Tests.

During the Initial Acceptance Tests, no unusual or special maintenance or operating procedures will be permitted other than normal activities typically required for normal operation.

The initial Acceptance Tests will be composed of the following individual tests, concurrently when possible:

15.3.1 Extended Run Test

Operation of the BUDG facility for five (5) consecutive days (Monday thru Friday) including Transport operations to remove product gas from the site. The BUDG shall maintain capacity as product demand and digester gas supply allow. Processing operations (but not transportation operations) shall be under automatic control throughout, with supervision performed by the permanent plant operating personnel. The Buyer may augment the permanent personnel with qualified staff to achieve continuous supervision.

During the full duration of the Extended Run Test, the BUDG Facility will be required to receive only digester gas.

During the full duration of the Extended Run Test, the BUDG Facility will be required to consume and receive the expected chemical and associated shipments.

During the full duration of the Extended Run Test, the Facility will be required to operate utilizing power generated by its fuel cell at maximum available capacity, 95% of the time.

Gas deliveries to the BUDG shall be determined by permanent in-plant instrumentation. The digester gas delivery rate shall be determined from values recorded by the Point of Delivery Flow Meter.

The gas processing rate shall be determined by permanent BUDG instrumentation which will measure the flow, temperature, and pressure of all digester gas. An on-line gas chromatograph shall be used to measure the methane content of the gas.

During the Extended Run Test period, the BUDG unit must maintain the highest reasonable operating capacity for sustainable stable operation under the existing PLWTP operating conditions and the existing gas loadout conditions including the ability to

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transport the gas for at least 110 hours of the 120 hour test period. Average operating capacity for the duration of the test shall be greater than 50% of the maximum rated capacity established during the test. Downtime for scheduled maintenance of the PLWTP systems, other than digester gas related, shall not affect the duration of the test.

No unusual or special maintenance or operating procedures will be permitted other than normal activities typically required for normal full load operations.

15.3.2 Maximum Capacity (throughput) test

The BUDG Facility shall be tested at maximum design throughput for a period of not less than four (4) hours continuous. Seller shall cooperate to achieve a test window wherein the digester gas availability will be at or above appx. 1.6 MMSCFD continuous flow rate equivalent. The Net compressed digester gas Capacity of the BUDG shall be determined by permanent BUDG instrumentation with preference given to instruments that incorporate totalizers. Net electrical consumption shall be measured by a billing grade kilowatt-hour meter.

15.3.3 Emissions and Flare Test

Emissions shall be monitored from all sources and the flare of the BUDG and PLWTP will be tested per ADCD requirements and additionally per Seller's requirements in all BUDG operational modes to ensure correct and proper operation of all systems and the proper and intended operation of all automatic and manual control systems.

15.3.4 Noise Emission Test

Noise Emission Test will be conducted during the Extended Run Test and the Maximum Capacity Test to confirm compliance with the Seller's requirements (75 dBA at the facility property line).

Noise Emission Tests shall be performed at night at receptors identified in the Acceptance Test Protocol, at the entrance road to the plant adjacent to the BUDG site, the operations Building, and at four (4) points located at the PLWTP property line selected by the Seller.

15.3.5 Truck Movement Test

This test shall be performed for 48 hours at each of the loadout facilities and with the system in full operation. It shall demonstrate that the truck traffic associated with the BUDG and Staging comply with the PLWTP Traffic Control plan for this project and do not significant impact the PLWTP. Safe Loading of trucks will also be demonstrated. No odors or gas releases shall be detected at any lease hold boundary.

15.3.6 Initial Acceptance Test Report

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After Completion of the Initial Acceptance Tests, and certification by the Seller and the Buyer, an Acceptance Tests report shall be prepared by the Buyer(s) and within 30 calendar days of such certification; three (3) copies shall be submitted to the Seller. This report shall contain, but not be limited to, the following information and certifications:

- Copies of all data and log sheets, as provided for in the Acceptance Test Protocol.
- Copies of all laboratory analyses.
- Copies of results of any and all tests performed during the Acceptance Tests.
- All necessary certificates relating to calibrations, testing, evaluation, analysis, and performance required pursuant to the Acceptance Test Protocol.
- A summary of test results supported by calculations demonstrating the ability to meet the requirements relating to the Extended Run, Maximum Capacity, Emissions Tests, and other tests required.
- A certification signed by an officer of the Buyer stating that: the Initial Acceptance Tests were conducted in accordance with the Acceptance Test Protocol; the requirements of the Initial Acceptance Tests were satisfied or the extent to which they were not satisfied; and the Initial Acceptance Tests demonstrated the BUDG Facility met the Acceptance Standard.

15.3.7 Acceptance Standard

In the event that it is determined that the BUDG Facility has not passed the Acceptance Tests as performed, then, in any retesting of the Facility, all individual test activities, with respect to such Acceptance Test, will be performed or, as arrangements are made in advance with the Seller. Retesting for Extended Run performance or Environmental Compliance may be conducted separately, but must be in accordance with the respective protocols for that test.

After successful completion and Certification of the results of the Initial Acceptance Tests, the Seller shall issue a Conditional Notice to Operate the BUDG Facility for commercial operations. This milestone is intended to signal the start of the Contract period for gas delivery, subject to the 15 month limitation after Contract Approval and Notice to Proceed from the Seller.

15.4 FINAL ACCEPTANCE

Final Acceptance shall be achieved when:

- The Punch List is closed out satisfactorily to both Seller and Buyer; and

- Within a ninety (90) day period after the Conditional Notice To Operate, normal BUDG operations have been achieved on a continuous and consistent basis. This shall be demonstrated by recording a thirty (30) day period with BUDG uptime in excess of 95%, no upset conditions affecting PLWTP operations, environmental permit conditions being met, and continuous deliveries of BUDG product gas to the fuel cell sites.

The Buyer shall, within five (5) days of the end of the 30 day period, issue a report detailing all unusual operating events during the 30 day period, and make available all operating data, including gas flow rates and totals, flare interactions, environmental measurements, and other operational data available and of interest to the Seller.

Upon concurrence by the Seller that the 30 day operational period has been successfully demonstrated, the Seller shall issue a Final Notice of Acceptance and Notice to Operate the BUDG Facility to the Buyer.

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Attachment A1:

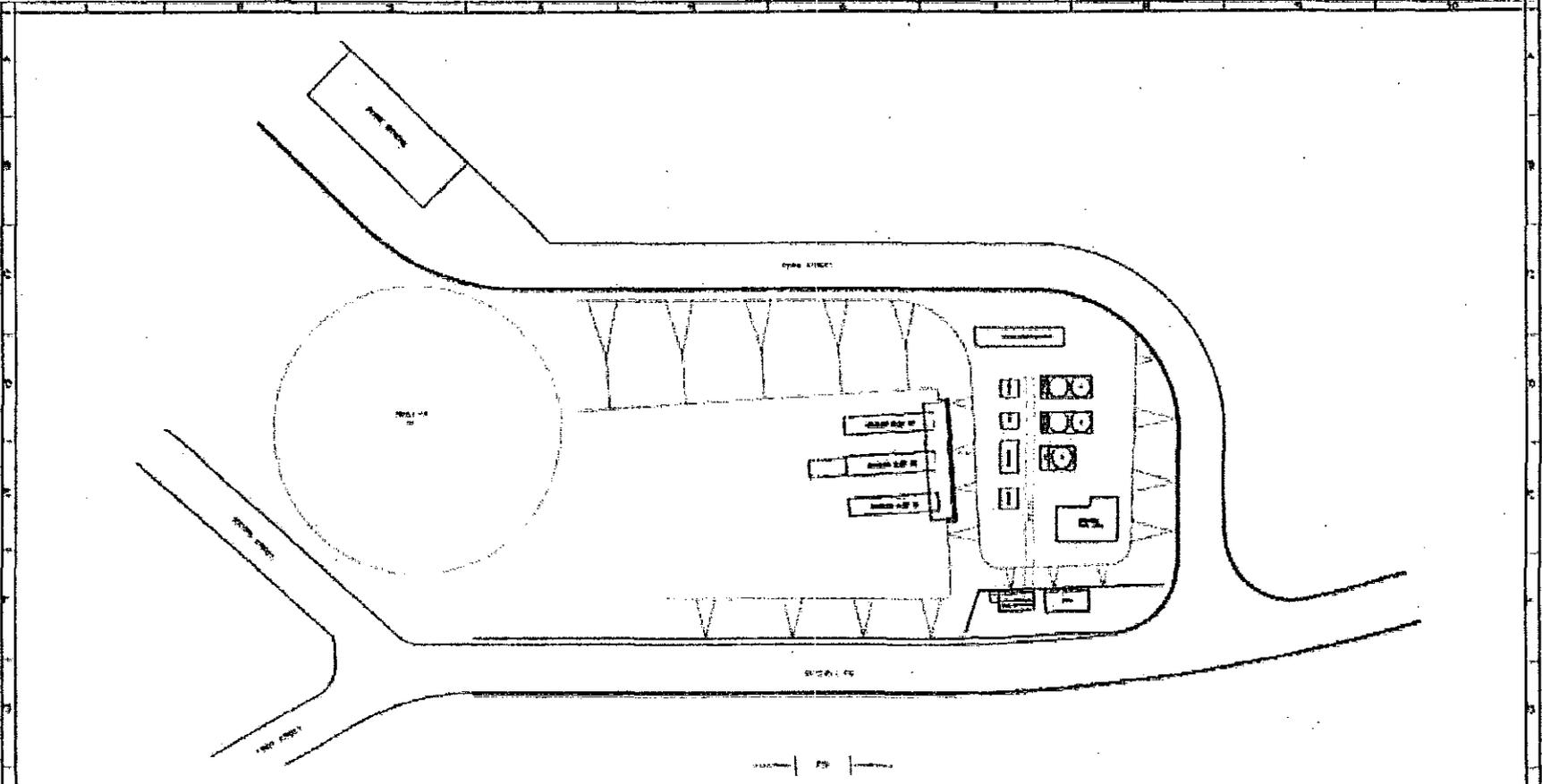
Site Plan

and

Reference Drawings

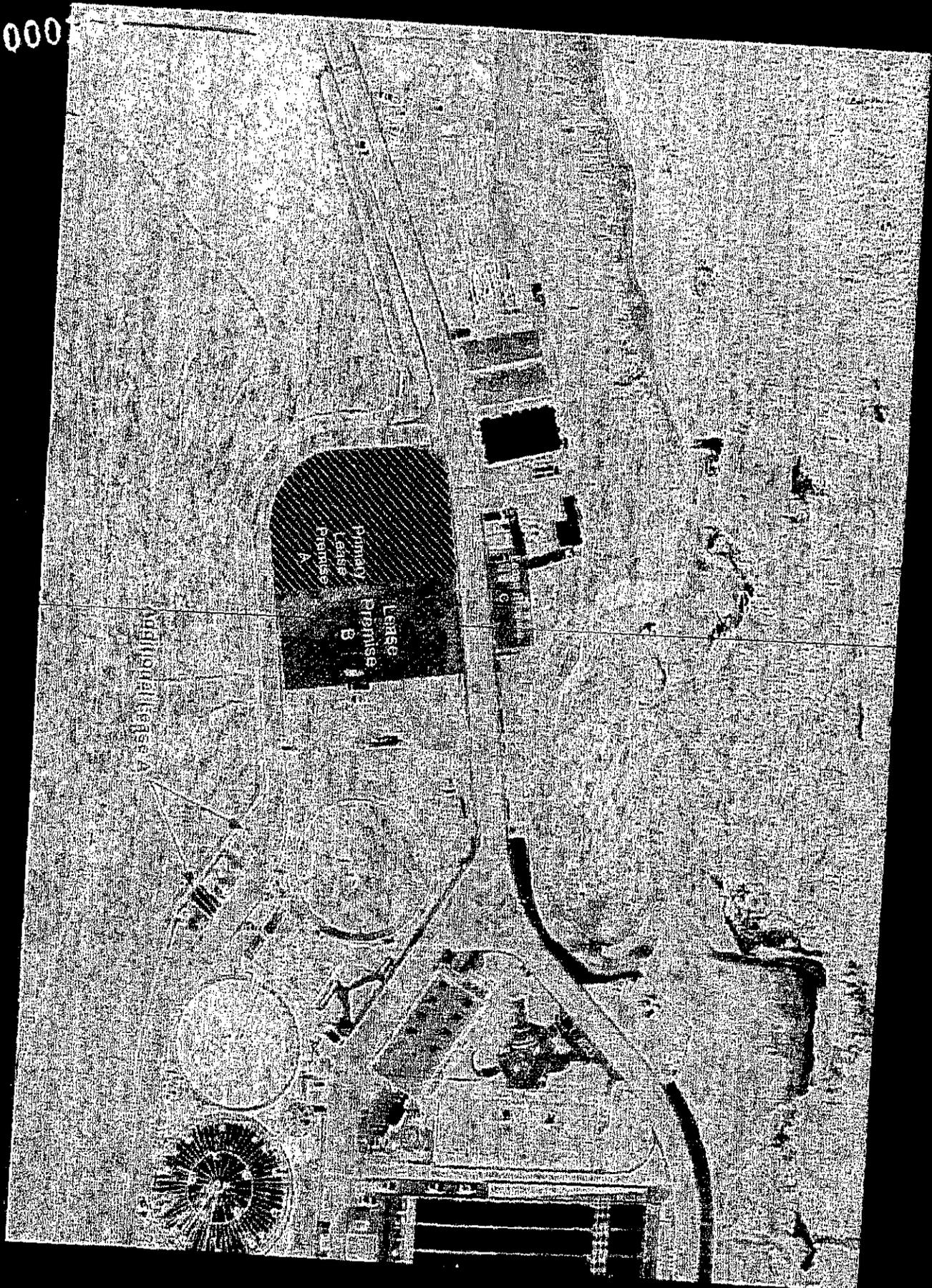
Reference drawings that were provided during the selection process will be retransmitted prior to the NTP

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DETAILED SCOPE OF WORK FOR THE BENEFICIAL USE OF DIGESTER



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Attachment A2
General Requirements

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GENERAL PROJECT REQUIREMENTS

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SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 GENERAL

- A. The WORK to be performed under this Contract shall consist of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and furnishing all labor, transportation and services, including fuel and essential communications, and performing all work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The WORK shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper design and construction of the WORK in good faith shall be provided by the BUYER as though originally so indicated, at no increase in cost to the SELLER. The SELLER may delegate its responsibilities to a management firm to assist with its duties.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. General

The Scope of Work (SOW), Supplementary General Conditions, and the Design/Build Agreement take precedence over this document.

1.3 WORK BY OTHERS

- A. **Interference With Work On Utilities:** The BUYER shall cooperate fully with all utility forces of the SELLER or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the WORK, and shall schedule the WORK so as to minimize interference with said relocation, altering, or other rearranging of facilities.

1.4 SPECIFIC COORDINATION AND MILESTONE REQUIREMENTS

A. Coordination Requirements

The BUYER shall coordinate the WORK of this Contract with the continued operation of the WWTP. Coordination activities include, but are not limited to, the scheduling of work at interface locations to permit normal Wastewater facility operations except as approved in advance by the Seller.

1.5 DEFINITIONS APPLICABLE TO TECHNICAL SPECIFICATIONS

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A. The following words have the meaning defined in the Technical Portions of the WORK:

Indicated - is a word used to direct the BUYER to information contained on the drawings or in the Specifications. Terms such as "shown," "noted," "scheduled," and "specified" also may be used to assist in locating information but no limitation of location is implied or intended.

Furnish - means to supply and deliver to the site, to unload and unpack ready for assembly, installation, testing, and start-up.

Install - defines operations at the site including assembly, erection, placing, anchoring, applying, shaping to dimension, finishing, curing, protecting, and cleaning, ready for the SELLER's use.

Provide - is defined as furnish and install, ready for the intended use.

Installer - a person or firm engaged by the BUYER or any sub BUYER for the performance of installation, erection, or application work at the site. Installers must be expert in the operations they are engaged to perform.

** END OF SECTION **

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SECTION 01039 - COORDINATION AND MEETINGS

PART 1 - GENERAL

1.1 GENERAL

- A. In addition to coordination requirements, this section includes information on the preconstruction meeting, the site mobilization meeting, progress meetings, and pre-installation meetings.

1.2 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the SOW, Design Drawings and Specifications to assure an efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Coordinate completion and clean up of work of separate sections in preparation for Substantial Completion and for portions of work designated for SELLER'S partial utilization.

1.3 PRECONSTRUCTION MEETING

- A. Prior to the commencement of work at the site, a preconstruction conference will be held at a mutually agreed time and place. The BUYER'S Project, its superintendent, and subcontractor as the BUYER deems appropriate shall attend the preconstruction conference. Other attendees may be:
 - 1. OWNER
 - 2. Representative of the OWNER.
 - 3. Governmental representatives as appropriate.
 - 4. DESIGN CONSULTANT(S)

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- 5. Others as requested by the SELLER, or CITY.

- B. Unless previously submitted to the SELLER, the BUYER shall bring to the conference information requested with the notification of the time and place of the preconstruction conference.

- C. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The complete agenda will be furnished to the BUYER prior to the meeting date. However, the BUYER should be prepared to discuss all of the items listed below.
 - 1. Status of BUYER's insurance and bonds.
 - 2. BUYER's tentative schedules.
 - 3. Transmittal, review, and distribution of BUYER's submittals.
 - 4. Processing applications for payment.
 - 5. Maintaining record documents.
 - 6. Critical work sequencing.
 - 7. Field decisions and Change Orders.
 - 8. Use of project site, office and storage areas, security, housekeeping, and SELLER's needs.
 - 9. Major equipment deliveries and priorities.
 - 10. BUYER's assignments for safety and first aid.

- D. The SELLER will preside at the preconstruction conference and will arrange for recording and distributing the minutes in written form to all persons in attendance.

1.4 SITE MOBILIZATION MEETING

- A. The SELLER will schedule a meeting at the Project site prior to BUYER occupancy.

- B. Attendance Required: SELLER, BUYER, Superintendent, and major Subcontractors.
- C. Agenda:
 - 1. Use of premises by SELLER and BUYER.
 - 2. SELLER'S requirements and partial occupancy if applicable.

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3. Construction facilities and controls provided by SELLER.
4. Temporary utilities provided by SELLER.
5. Building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Procedures for testing.
9. Procedures for maintaining record documents.
10. Requirements for start-up of equipment.
11. Inspection and acceptance of equipment put into service during construction period.

D. The SELLER will record minutes and distribute copies to all participants.

1.5 PROGRESS MEETINGS

- A. The SELLER shall schedule and hold regular on-site progress meetings biweekly and at other times as required by progress of the WORK. The BUYER shall attend, and may also bring representatives of its suppliers, manufacturers, and subBUYERS.
- B. The SELLER shall preside at the meetings and will arrange for keeping and distributing the minutes. The purpose of the meetings will be to review the progress of the WORK, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop. During each meeting, the BUYER is required to present any issues which may impact his work, with a view to resolve these issues expeditiously.

1.6 PRE-INSTALLATION MEETING

- A. When required in individual specification sections, The SELLER will convene a pre-installation meeting at the work site prior to commencing work of the section.
- B. Attendance will be required of parties directly affecting, or affected by, work of the specific section. Failure of the BUYER, subcontractor, or Supplier to attend may result in a charge to the BUYER for costs incurred by the SELLER, in attending the meeting.

C. The SELLER will prepare an agenda and preside at the meeting:

1. Review conditions of installation, preparation and installation procedures.

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2. Review coordination with related work.

D. The SELLER will record the minutes and distribute copies to the SELLER, BUYER, and other participants.

1.7 MEANS & METHODS MEETINGS

A. From time to time the BUYER shall, as necessary to justify changes in the schedule, or as requested, present to the SELLER and the SELLER a revised oral presentation.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

** END OF SECTION **

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SECTION 01045 - CUTTING AND PATCHING
(Off Leased Site Only)

PART 1 - GENERAL

1.1 DEFINITION

"Cutting-and-Patching" is defined to include the cutting and patching of nominally completed and previously existing concrete, steel, wood, and miscellaneous metal structures; piping; and pavement in order to accommodate the coordination of the WORK, or the installation of other facilities or structures or to uncover other facilities and structures for access or inspection, or to obtain samples for testing, or for similar purposes.

1.2 REQUIREMENTS OF STRUCTURAL WORK

- A. Structural work shall not be cut in a manner that may result in a reduction of load-carrying capacity or load/deflection ratio.
- B. Prior to cutting-and-patching the following categories of work, the BUYER shall obtain the SELLER'S approval to proceed:
 - 1. Miscellaneous structural metals, including equipment supports, stair systems and similar categories of work
 - 2. Structural concrete
 - 3. Bearing and retaining walls
 - 4. Structural decking
 - 5. Exterior curtain wall construction

1.3 OPERATIONAL AND SAFETY LIMITATIONS

- A. The BUYER shall not cut or patch operational elements and safety-related components in a manner that may result in a reduction of capacities to perform in the manner intended or result in decreased operational life, increased maintenance, or decreased safety.
- B. Prior to cutting-and-patching the following categories of work, the BUYER shall obtain the SELLER'S approval to proceed:
 - 1. Operating systems and equipment

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2. Water, moisture, vapor, air, smoke barriers, membranes, and flashings
3. Control, communication, conveying, and a electrical wiring systems

1.4 VISUAL REQUIREMENTS

The BUYER shall not cut or patch work which is exposed on the exterior or exposed in occupied spaces, in a manner that may result in a reduction of visual qualities or resulting in substantial evidence of the cut-and-patch work, both as judged solely by the SELLER. The BUYER shall remove and replace work judged by the SELLER to have been cut or patched in a visually unsatisfactory manner.

1.5 APPROVALS

- A. Where prior approval of cutting-and-patching is required, the BUYER shall submit the request well in advance of time work will be performed. The request should include a description of why cutting-and-patching cannot reasonably be avoided, how it will be performed, how structural elements (if any) will be reinforced, products to be used, firms and tradesmen to perform the work, approximate dates of the work, and anticipated results in terms of structural, operational, and visual variations from the original WORK.
- B. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
- C. Where cutting-and-patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
- D. Approval by the SELLER to proceed with the cutting-and-patching does not waive the SELLER'S right to later require complete removal and replacement of a part of the WORK found to be not in accordance with the Contract Documents or industry standards.

PART 2 - PRODUCTS

2.1 MATERIALS USED IN CUTTING-AND-PATCHING

- A. The BUYER shall use material identical with the original materials where feasible. If identical materials are not available, the BUYER shall provide materials for cutting-and-patching which will result in equal-or-better work than the work being cut-and-patched, in terms of performance characteristics and visual effects where applicable.

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- B. Materials shall comply with the requirements of the technical specifications wherever applicable.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before cutting existing surfaces, the BUYER shall examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. The BUYER shall take corrective action before proceeding, if unsafe or unsatisfactory conditions, as determined by the SELLER, are encountered.
- B. Before proceeding, the BUYER shall meet at the site with all subcontractors involved in cutting and patching, the SELLER, and any BUYERS or subcontractors. Areas of potential interference and conflict shall other effected be reviewed and procedures to resolve potential conflicts shall be determined.

3.2 PREPARATION

- A. Provide temporary support of work to be cut.
- B. Protect existing work during cutting-and-patching to prevent damage.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork that must remain in service. Do not remove or relocate until provisions have been made to bypass them.
- E. Take precaution necessary to prevent fires and to prevent the false activation of fire alarms.

3.3 PERFORMANCE

- A. Employ skilled workmen to perform cutting-and-patching. Proceed with cutting-and-patching at the earliest feasible time and complete without delay.
- B. Cut existing work to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- C. Cut existing work using methods least likely to damage elements to be retained or adjoining construction. Where possible, review proposed procedures with the

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original installer; comply with the original installer's recommendations. Review as-built or record drawings if available.

- D. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- E. To avoid marring existing finished surfaces, cut, or drill from the exposed or finished side into concealed surfaces.
- F. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
- G. Comply with requirements of applicable Sections of Division 2 where cutting and patching requires excavating and backfilling.
- H. Bypass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after bypassing and cutting.
- I. Patch with durable seams that are as invisible as possible. Comply with tolerances as specified in these Contract Documents.
- J. Where feasible, inspect and test patch areas to demonstrate integrity of the installation.
- K. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in manner that will minimize evidence of patching and refinishing.
 - 1. Where removal of walls or partitions extends from one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
- M. At penetration of fire rated walls, ceilings, or floors, completely seal voids with suitable fire rated material to full thickness of the penetrated element.

3.4 CLEANING

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- A. Thoroughly clean areas and spaces where cutting-and-patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

** END OF SECTION **

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SECTION 01050 - FIELD ENGINEERING

PART 1 - GENERAL

1.1 QUALITY CONTROL

3. The BUYER is required to:

1. Employ a professional engineer of the discipline required for specific service on the project, registered in the State of California.
2. Submit evidence of Engineer's Errors and Omissions insurance coverage in the form of an insurance certificate.

1.2 SURVEY REFERENCE POINTS - NOT USED

1.3 PROJECT MASTER RECORD DOCUMENTS

A. The BUYER is required to:

1. Maintain a complete and accurate log of control and survey work as it progresses.
2. The BUYER shall keep and maintain, at the job site, one record set of Contract Specifications and Drawings. The BUYER shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Documents, including concealed construction and utility features which are revealed during the course of construction. Record Documents shall be supplemented by any detailed sketches or photographs as necessary or directed to indicate, fully, the WORK as actually constructed. These Master Record Documents of the BUYER's representation of as-built conditions, including all revisions made necessary by Requests for Information, Addenda, Field Orders, approved Submittals, properly verified test reports, and Change Orders shall be maintained up-to-date during the progress of the WORK, and shall be made available for review and comment by the SELLER at the monthly review meeting (reference 01025, 3.1.A)
3. On the specifications legibly mark and record at each Product Section a description of the actual Products installed, including the following:
 - Manufacturer's name, address, telephone number, product model, and serial number.
 - Product substitutions or alternates utilized.
 - Changes made by Addenda, Requests for Information, Clarifications, Field

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Orders, or Change Orders.

4. Legibly mark Record Drawings and shop drawings to record actual construction including:
 - Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the WORK.
 - Field changes of dimension and detail.
 - Details not on original or incorrectly depicted on Contract Drawings.
 5. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the Record Documents shall be updated by indicating those portions which are superseded by change order drawings or final shop drawings, and by including appropriate reference information describing the change orders by number and the shop drawings by manufacturer, drawing, and revision numbers.
 6. Make Record Documents accessible to the SELLER at all times during the construction period.
- B. The SELLER shall review the BUYER's updated Record Documents on a monthly basis as a prerequisite for recommending approval of the BUYER's monthly progress payment. Failure of the BUYER to maintain updated Record Documents shall result in delaying the BUYER's monthly progress payment until such Record Documents are properly updated.
- C. Upon substantial completion of the WORK and prior to final acceptance, the BUYER shall finalize and deliver a complete set of Master Record Documents to the SELLER for transmittal to the SELLER, conforming to the construction records of the BUYER. This set of Master Record Documents shall consist of corrected specifications showing any revisions and corrected full sized drawings showing the reported location of the WORK. Said up-to-date Master Record Documents shall be in the form of a set of full sized prints and specifications with legibly plotted information overlaid in red. The information submitted by the BUYER in the Master Record Documents will be assumed to be correct, and the BUYER shall be responsible for the accuracy of such information, and for any errors or omissions which may appear on the Master Record Documents as a result.
- D. Final payment or Release of Retention will not be acted upon until the BUYER-prepared Master Record Documents have been delivered to the SELLER.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

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3.1 EXAMINATION

- A. Verify locations of control points prior to starting work.
- B. Verify horizontal and vertical position of reference points.
- C. Promptly notify the SELLER of any discrepancies discovered prior to proceeding with the work.

END OF SECTION

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01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.1 GENERAL

- A. **Titles of Sections and Paragraphs:** Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.
- B. **Applicable Publications:** Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the WORK is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.
- C. **Specialists, Assignments:** In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the BUYER has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of contract requirements remains with the BUYER.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.
- B. References herein to "Building Code" or "Uniform Building Code" shall mean Uniform Building Code of the International Conference of Building Officials (ICBO). Similarly, references to "Mechanical Code" or "Uniform Mechanical Code," "Plumbing Code" or "Uniform Plumbing Code," "Fire Code" or "Uniform Fire Code," shall mean Uniform Mechanical Code, Uniform Plumbing Code and Uniform Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the

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National Fire Protection Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the WORK is advertised for bids, as adopted by the agency having jurisdiction, shall apply to the WORK herein, including all addenda, modifications, amendments, or other lawful changes thereto.

- C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the order of precedence as listed in the General Conditions shall govern. In those cases where a conflict cannot be resolved by utilizing the order of precedence, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the SELLER for clarification and directions prior to ordering or providing any materials or furnishing labor. The BUYER's bid shall reflect the most stringent Contract Document requirements.
- D. The BUYER shall construct the WORK specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.
- E. **Applicable Standard Specifications:** References in the Contract Documents to "Standard Specifications" or SSPWC shall mean the Standard Specifications for Public Works Construction, 2000 edition at the time of award, including the 2000 Regional Supplement Amendments and City of San Diego Supplement Amendments.
- F. References herein to "OSHA Regulations for Construction" shall mean **Title 29, Part 1926, Construction Safety and Health Regulations**, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- G. References herein to "OSHA Standards" shall mean **Title 29, Part 1910, Occupational Safety and Health Standards**, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- H. **Applicable Safety Standards:** References herein to "Cal-OSHA" shall mean **State of California, Department of Industrial Relations, Construction Safety Orders**, as amended to date, and all changes and amendments thereto.

1.3 QUALITY ASSURANCE

- A. Conform to reference standard by date of issue current on date for receiving bids.
- B. Should the specified reference standards conflict with the Contract Documents, refer to paragraph 1.2 (c) of this Section.

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- ACI American Concrete Institute
Box 19150
Reford Station
Detroit, MI 48219
- ADC Air Diffusion Council
230 North Michigan Avenue
Chicago, IL 60601
- AFBMA Antifriction Bearing Manufacturers Association
1101 Connecticut Avenue N.W. Suite 700
Washington, DC 20036
- AMCA Air Movement and Control Association
30 West University Drive
Arlington Heights, IL 60004
- ANSI American National Standards Institute
1430 Broadway
New York, NY 10018
- ARI Air-Conditioning and Refrigeration Institute
1501 Wilson Boulevard
Arlington, VA 22209
- ASHRAE American Society of Heating, Refrigerating and
Air Conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329
- ASME American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017
- ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103
- AWS American Welding Society
550 LeJeune Road, N.W.
Miami, FL 33135

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- ICBO International Conference of Building Officials
5360 S. Workman Mill Road
Whittier, CA 90601
- IEEE Institute of Electrical and Electronics Engineers
345 East 47th Street
New York, NY 10017
- NEC National Electric Code
1 Battery March Park
P.O. Box 9146
Quincy, MA 02169
- NEMA National Electrical Manufacturers' Association
2101 'L' Street, N.W.
Washington, DC 20037
- NFPA National Fire Protection Association
Battery March Park
Quincy, MA 02269
- SMACNA Sheet Metal and Air Conditioning CONTRACTORS
National Association
8224 Old Court House Road
Vienna, VA 22180
- UL Underwriters' Laboratories, Inc.
333 Pfingston Road
Northbrook, IL 60062

** END OF SECTION **

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SECTION 01300 - BUYER SUBMITTALS

PART 1 - GENERAL

1.1 GENERAL

- A. All submittals by the BUYER shall be submitted to the SELLER.
- B. BUYER shall assume all responsibility and cost for changing submittals and/or equipment after their approval by the SELLER.

1.2 SHOP DRAWINGS

- A. Wherever called for in the Contract Documents, the BUYER shall furnish to the SELLER for review eight (8) copies, plus one reproducible copy, of each shop drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items. The BUYER shall submit, the following for all prefabricated or manufactured structural, mechanical, electrical, plumbing, and process systems and equipment:
 - 1. Wiring and control diagrams of systems and equipment.
 - 2. Complete manufacturer's specifications, including materials description and paint system of all equipment supplied.
 - 3. Samples of finish colors for selection.
 - 4. Requirements for storage and protection prior to installation.
 - 5. Installation procedures.
 - 6. List of all requested exceptions to the Contract Documents and/or variations from the specified equipment.
- 7. Structural supports and associated calculation.
- B. All shop drawing submittals shall be accompanied by the SELLER's standard submittal transmittal form. The form may be obtained in quantity from the SELLER. Any submittal not accompanied by such a form, or where all applicable items on the form are not completed, may be returned for re-submittal.

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1. Sequentially number the transmittal forms. Re-submittals shall have original number with an alphabetic suffix.
 2. Identify Contract, BUYER, Subcontractor and/or Supplier; pertinent drawing sheet and detail number(s), and specification section number, as appropriate. On standard drawings or data sheets, clearly indicate model and option being proposed and strike out all non-relevant data.
 3. All submittals must be capable of being scanned electronically for filing on a computer file.
- C. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. A multiple-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the SELLER.
- D. Except as may otherwise be indicated herein, the SELLER will return four (4) prints of each submittal to the BUYER with comments noted thereon, within seven (7) calendar days following their receipt by the SELLER. It is considered reasonable that the BUYER shall make a complete and acceptable submittal to the SELLER by the second submission of a submittal item. The SELLER's and BUYER's maximum review period for each submittal, will be fourteen (14) days per submittal and the BUYER's re-submittal shall be made within seven (7) days. Therefore, for a submittal that requires a second submittal before it is complete, the maximum period for that submittal could be 21 days.
- E. If four (4) copies of a submittal are returned to the BUYER marked "NO EXCEPTIONS TAKEN," formal revision and re-submission of said submittal will not be required.
- F. If four (4) copies of a submittal are returned to the BUYER marked "MAKE CORRECTIONS NOTED," formal revision and re-submission of said submittal will not be required, unless specifically required.
- G. If a submittal is returned to the BUYER marked "REJECTED-RESUBMIT," the BUYER shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the SELLER.
- H. Fabrication of an item shall be commenced only after the SELLER has reviewed the pertinent submittals and the SELLER has returned copies to the BUYER marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

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Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.

- I. The SELLER's and SELLER'S review of BUYER shop drawing submittals shall not relieve the BUYER of the entire responsibility for the correctness of details and dimensions. The BUYER shall assume all responsibility and risk for any misfits due to any errors in BUYER submittals. The BUYER shall be responsible for the dimensions and the design of adequate connections and details.
- J. The SELLER's may schedule a submittal conference to provide for a rapid review of a submittal, should the project schedule warrant such a review. The SELLER, SELLER, BUYER, and a qualified manufacturer's representative shall attend the submittal conference.

1.3 BUYER'S SCHEDULE

The BUYER's construction schedules and reports shall be prepared and submitted to the SELLER in accordance with the provisions of Section 01310.

1.4 SELLER'S SELLER'S MANUAL

- A. The BUYER shall submit technical operation and maintenance information for each item installed off the leased site of mechanical, electrical and instrumentation equipment in an organized manner in the SELLER'S MANUAL. The SELLER'S MANUAL shall be written so that it can be used and understood by the SELLER'S operation and maintenance staff if the need occurs.
- B. The SELLER'S MANUAL shall be subdivided first by specification section number; second, by equipment item; and last, by "part." "Parts" shall conform to the following (as applicable):
 - 1. Part 1 - Equipment Summary
 - a. Summary: A summary table shall indicate the equipment name, equipment number, and process area in which the equipment is installed.
 - b. Form: The SELLER will supply an Equipment Summary Form for each item of mechanical, electrical and instrumentation equipment in the WORK. The BUYER shall fill in the relevant information on the form and include it in Part 1.

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2. Part 2 - Operational Procedures

- a. Procedures: Manufacturer-recommended procedures for the following shall be included in Part 2:

Installation

Adjustment

Start-up

Location of controls, special tools or other equipment required Related instrumentation needed for operation

Operating Procedures

Load Changes

Calibration

Shutdown

Troubleshooting

Disassembly

Reassembly

Realignment

Testing to determine performance efficiency

Tabulation of proper settings for all pressure relief valves, low and high pressure switches and other protection devices.

List of all electrical relay settings including alarm and contact settings

3. Part 3 - Preventive Maintenance Procedures

- a. Procedures: Preventive maintenance procedures shall include all manufacturer-recommended procedures to be performed on a periodic basis, both by removing and replacing the equipment or component and by leaving the equipment in place.
- b. Schedules: Recommended frequency of preventive maintenance procedures shall be included. Lubrication schedules, including lubricant SAE grade and type, and temperature ranges shall be covered.

4. Part 4 - Parts List

- a. Parts List: A complete parts list shall be furnished, including a generic description and manufacturer's identification number for each part. Addresses and telephone numbers of the nearest supplier and parts warehouse shall be included.
- b. Drawings: Cross-sectional or exploded view drawings shall accompany the parts list.

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5. Part 5 - Wiring Diagrams

Diagrams: Part 5 shall include complete internal and connection wiring diagrams for electrical equipment items.

6. Part 6 - Shop Drawings

Drawings: This part shall include approved shop or fabrication drawings, complete with dimensions.

7. Part 7- Safety

Procedures: This part describes the safety precautions to be taken when operating and maintaining the equipment or working near it.

8. Part 8 - Documentation

All equipment warranties, affidavits, and certifications required by the Technical Specifications shall be placed in this part.

Bound equipment SELLER'S manuals supplied by the vendor which are in different order may be provided rather than unbinding them to match the order described above.

- C. The BUYER shall furnish to the SELLER seven (7) identical SELLER'S MANUALS. Each set shall consist of one or more volumes, each of which shall be labeled and bound in a standard size, 3-ring, loose leaf, vinyl plastic hard cover binder suitable for bookshelf storage. Binder ring size shall not exceed 2.5 inches. A table of contents indicating all equipment in the manuals shall be prepared.
- D. SELLER'S MANUALS shall be submitted in final form to the SELLER not later than the 75% of construction completion date. All discrepancies found by the SELLER in the SELLER'S MANUALS shall be corrected by the BUYER within 30 days from the date of written notification by the SELLER.
- E. Incomplete or unacceptable SELLER'S MANUALS at the 75% construction completion point shall constitute sufficient justification to withhold the amount stipulated in Section 01700 from any monies due the BUYER.
- F. When available from the equipment vendor, the BUYER shall submit one copy of available sections of the final SELLER'S MANUALS in an electronic media format. The information shall be provided on a 3 2" disk in Word, Word Perfect, or ASCII files.

1.5 SPARE PARTS LIST

The BUYER shall furnish to the SELLER seven (7) copies of spare parts information for all mechanical, electrical, and instrumentation equipment. The spare parts list shall include the current list price of each spare part. The spare parts list shall be limited to those spare parts which each manufacturer recommends be maintained by the SELLER in inventory at the plant site. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet of spare parts to facilitate the SELLER in ordering. The BUYER shall cross-reference all spare parts lists to the equipment numbers designated in the Contract Documents. The spare parts lists shall be labeled and bound in standard size, 3-ring, loose leaf, vinyl plastic hard cover binders suitable for bookshelf storage. Binder ring size shall not exceed 2.5 inches.

1.6 SAFETY PLAN

Prior to the performance of any work the BUYER will submit to the SELLER for review and comment two copies of a contract specific Safety/Health and Security Plan signed by an officer of the BUYER's organization. Adequacy is the responsibility of the BUYER. See Section 01520 for the required safety plan content.

1.7 SAFETY PLAN

A. Prior to the performance of any work the BUYER shall provide all submittals required by State and Federal grant applications, regulatory agencies, the Supplemental General Conditions and as may be specifically required in other parts of this Contract. BUYER shall make provision for incorporating all requirements for administrative submittals into subcontracts awarded for the work as part of the agreed price for the work.

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SECTION 01309 - SCHEDULE

PART 1 - GENERAL

1.1 REQUIREMENTS OVERVIEW

- A. The BUYER'S planning, scheduling and execution of the contract work shall be presented to the SELLER by submission of the progress schedule information and data.
- B. A Schedule approved by the SELLER shall be the basis of the construction schedule and the BUYER'S payment schedule. Each item will have identified an early start, late start, early finish, and late finish date that will allow the work to be commenced in accordance with the contract SCHEDULED milestones.
- C. The WORK under this contract will be planned, scheduled, executed, and reported by the BUYER using a CPM (Critical Path Method) schedule. The BUYER will adhere to established technical standards for CPM using a computerized precedence diagram method. The schedule files shall be in Primavera Project Planner (P3) format version 1.1 for windows format or higher.
- D. The BUYER is responsible for coordinating its own schedules (including subcontractors) as well as construction activities of others as directed by the SELLER. The SELLER will maintain the overall Project Construction Schedule, of which the BUYER'S Construction Schedule will be a part. The BUYER should refer to the Project Construction Schedule to ensure that project site coordination and work by others at the site properly depicts the BUYER'S planning.
- E. All submittals discussed in this section shall be prepared and handled in accordance with Section 01300 - BUYER Submittals.

1.2 QUALITY ASSURANCE

- A. In preparing all contract schedules, it is the responsibility of the BUYER to work with each subcontractor and supplier to obtain information pertinent to the planning and updating of their respective activities and schedules.

1.3 GENERAL CRITERIA

- A. The Schedule is prepared by the BUYER and reflects the BUYER'S plans for and status of the WORK.
- B. The Schedule shall show the breakdown of work into activities and relationships only to the extent required to effectively manage the WORK. The Schedule shall show the

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division of the WORK into activities and specify the progression from the Notice To Proceed to the end of the Contract Time.

- C. The Scope of the WORK shall be broken down into significant milestones and activities that include the work of all major trade subcontractors and supplier. Mobilization activities shall also be identified. Work being performed by MBE/WBE firms shall be identified by a distinguishable coding. Each activity shall have a time duration.
- D. The BUYER'S Schedule shall include all procurement related activities which lead to delivery of permanent materials to the site in a timely manner. The procurement activities shall indicate significant events in the procurement process such as issuance of purchase orders and subcontracts, submittal of shop drawings, review and approval of shop drawings, release for fabrication, release for shipment, etc., as appropriate.
- E. The BUYER shall schedule those requisite duties and responsibilities of the SELLER, the SELLER and others (performing work for the SELLER) indicated in or required by the Contract Documents within the Contract Time. The Schedule shall incorporate activities and sequences based on the information given in the Contract Documents, and if not given, as indicated by the SELLER in writing.

** END OF SECTION **

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SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.1 DEFINITION

- A. Specific quality control requirements for the WORK are indicated throughout the Contract Documents. The requirements of this Section are primarily related to performance of the WORK beyond furnishing of manufactured products. The term "Quality Control" includes inspection, sampling and testing, and associated requirements.

1.2 PROJECT QUALITY CONTROL PLAN

- A. The BUYER is responsible for producing WORK to meet the quality required by the contract documents and to perform the quality control efforts necessary to ensure those requirements are met. The SELLER's inspection of any WORK will not relieve the BUYER of the primary responsibility for such efforts.
- B. The BUYER will be obligated to accommodate procedural changes to contract required quality control issues requested by the SELLER.

1.3 SAMPLING AND TESTING

- A. Unless otherwise indicated, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, or as applicable to the class and nature of the article or materials considered; however, the SELLER reserves the right to use any generally-accepted system of sampling and testing which, in the opinion of the SELLER will insure the SELLER that the quality of the workmanship is in full accord with the Contract Documents. Test procedures, reporting, recording and recording methods shall be provided to the Seller for review thirty (30) calendar days prior to any official testing. The Seller shall provide any comments on the proposed procedures, etc., within fifteen (15) calendar days.
- B. Any waiver by the SELLER of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any requirements of the Contract Documents.

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- C. Notwithstanding the existence of such waiver, the SELLER reserves the right to make independent investigations and tests, and failure of any portion of the WORK to meet any of the requirements of the Contract Documents, shall be reasonable cause for the SELLER to require the removal or correction and reconstruction of any such work in accordance with the General Conditions.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. **Inspection:** The BUYER shall inspect materials or equipment upon arrival on the job site and immediately prior to installation. The BUYER shall reject damaged and defective items. This inspection shall include a review of Contract requirements; a check to assure that all materials and/or equipment have been tested, submitted, and approved; examination of the work area to ascertain that all preliminary work has been completed; and a physical examination of materials and equipment to assure that they conform to reviewed shop drawings or submittal data. This inspection shall also include instruction as necessary to assure that workmen know the requirements of the Contract as they pertain to the feature, an examination of the quality of workmanship, as well as a review of control testing for compliance with the Contract requirements.
- B. **Measurements:** The BUYER shall verify measurements and dimensions of the WORK, as an integral step of starting each installation.
 - 1. **Special Procedures:** Methods and facilities shall be provided to assure conformance with requirements for special process specifications such as welding, heat treating and nondestructive testing of materials. Certifications for personnel, procedures, and equipment shall be maintained as required to meet the requirement of the Contract Documents and all applicable codes.
- D. **Manufacturer's Instructions:** Where installations include manufactured products, the BUYER shall comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in Contract Documents.

3.2 MANUFACTURER'S FIELD INSTALLATION SERVICES AND REPORTS

- A. When specified in individual specification sections, the BUYER shall require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, (test, adjust, and balance of equipment) and to provide instructions when necessary.
- B. The BUYER shall report to the SELLER in writing any observations and site decisions or instructions given by the manufacturer's representative to the BUYER that are supplemental or contrary to manufacturers' written instructions.

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- C. The BUYER shall submit manufacturer representative's reports (in duplicate within 10 days of each field visit, to the SELLER for review. If duration of field visit is greater than one week, submit weekly reports. The final report shall certify that equipment or system has been satisfactorily installed and is functioning correctly.

** END OF SECTION **

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SECTION 01505 - MOBILIZATION

PART 1 - GENERAL

1.1 GENERAL

A. Mobilization shall include the moving onto the site of all personnel and equipment; implementing security requirements; and as approved in advance by the Seller; furnishing and erecting temporary buildings and other construction facilities; and all as required for the proper performance and completion of the WORK. Mobilization shall include but not be limited to the following principal items:

1. Moving on to the site of all BUYER'S personnel and equipment required for construction operations.
2. Constructing and implementing security features and requirements in compliance with the Contract Documents.
3. Obtaining all required permits.
4. Having all OSHA required notices and establishment of safety programs.
5. Submitting initial submittals.

At the SELLER'S discretion it may also include the following items:

1. Installing temporary construction power, wiring, and lighting facilities.
2. Providing all on-site communication facilities.
3. Providing on-site sanitary facilities and potable water facilities for PVI BUYER personnel if needed.

1.2 CONSTRUCTION FACILITIES PLAN

- A. Prior to commencement of any field work, the BUYER shall submit a Construction Facilities Plan to SELLER for approval. Said plan shall show the layout, equipment, materials and procedures that BUYER proposes for construction of temporary electrical, lighting, water, and sanitation, as required.
- B. The BUYER'S construction facilities shall be a temporary nature. The BUYER shall be wholly responsible for the security its laydown area, and for all its plant, materials, equipment, and tools at all times.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

** END OF SECTION **

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SECTION 01510 - TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The BUYER shall make arrangements with the appropriate utility agencies for any required temporary connections to the utilities. The BUYER is responsible for extending any utility services to the required point of use.
- B. Type Of Services: The types of utility services required for general temporary use at the project site, may include but are not limited to the following:
 - .Potable water
 - .Sanitary facilities
- C. Scheduled Uses: The BUYER shall schedule the implementation and termination of service for each temporary utility or facility.

PART 2 - PRODUCTS

2.1 MATERIALS

- 8. The BUYER shall provide either new or used materials and equipment, which are in substantially undamaged condition and without significant deterioration and which are recognized in the construction industry, by compliance with appropriate standards, as being suitable for intended use in each case. Where a portion of a temporary utility is provided for the BUYER by a utility company, the BUYER shall provide the remainder with matching and compatible materials and equipment and shall comply with recommendations of the utility company.

PART 3 - EXECUTION

3.1 INSTALLATION OF TEMPORARY UTILITY SERVICES

- A. General: Wherever feasible, the BUYER shall engage the utility company to install temporary service to the project, or as a minimum, to make connection to existing utility service; shall locate services where they will not interfere with total project construction work, including installation of permanent utility services; shall maintain temporary services as installed for required period of use; and shall relocate, modify or extend as necessary from time to time during that period as required to accommodate total project construction work.

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3.2 ELECTRICAL SERVICE

1. BUYER Operations: The BUYER shall pay all costs for electrical system installation.
2. SELLER will provide a connection in power center adequate to supply the Buyer 480v, 3 phase power rated at 50 kw.
3. Approval of Electrical Connections: All temporary connections for electricity shall be subject to approval of the SELLER and the power company representative, and shall be removed in like manner at the BUYER'S expense prior to final acceptance of the WORK.
4. Separation of Circuits: Unless otherwise permitted by the SELLER, circuits separate from lighting circuits shall be used for all power purposes.
5. Construction Wiring: All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical facilities shall conform to the requirements of Title 8, Industrial Relations, Subchapter 5, Electrical Safety Orders, California Administrative Code; and Subpart K of the OSHA Safety and Health Standards for Construction.

3.3 INSTALLATION OF POWER DISTRIBUTION SYSTEM

- A. Temporary Power Distribution: If required, the BUYER shall provide a weatherproof, grounded, temporary power distribution system sufficient to accommodate performance of entire WORK of the Contract, including but not necessarily limited to temporary electrical heating where indicated; operation of test equipment and test operation of building equipment and systems which cannot be delayed until permanent power connections are operable; temporary operation of other temporary facilities, including permanent equipment and systems which must be placed in operation prior to use of permanent power connections; and power for temporary operation of existing facilities (if any) at the site during change-over to new permanent power system. Provide circuits of adequate size and proper power characteristics for each use; run circuit wiring generally overhead, and rise vertically in locations where it will be least exposed to possible damage from construction operations, and result in least interference with performance of the WORK; provide rigid steel conduit or equivalent raceways for wiring which must be exposed on grade, floors, decks, or other recognized exposures to damage or abuse.
- B. Provide power outlets for BUYER'S operations, with transformers, branch wiring and distribution boxes located safely and conveniently for the proposed construction activities. Provide flexible power cords as required.
- C. Maintain main service disconnect and over current protection at source distribution equipment.

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3.4 INSTALLATION OF LIGHTING

- A. Construction Lighting: All work conducted at night or under conditions of deficient daylight shall be suitably lighted to insure proper work and to afford adequate facilities for inspection and safe working conditions.
- B. Temporary Lighting: The BUYER shall provide a general, weatherproof, grounded temporary lighting system in every area of construction work, as soon as is practically feasible and provide sufficient illumination for safe work and traffic conditions; and run circuit wiring generally overhead, and rise vertically in locations where it will be least exposed to possible damage from construction operations on grade, floors, decks, or other recognized areas of possible damage or abuse.
- C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- D. Maintain lighting and provide routine repairs.
- E. Permanent building lighting shall not be utilized during construction without prior written approval of the SELLER.

3.5 WATER SUPPLY

- A. General: The BUYER shall provide an adequate supply of water of a quality suitable for all domestic purposes. Water used for domestic purposes shall be free of contamination and shall conform to the requirements of the State and local authorities for potable water. The BUYER shall be solely responsible for the adequate functioning of its water supply system and shall be solely liable for any claims arising from the use of same, including discharge or waste of water therefrom.

The BUYER shall coordinate with the SELLER for obtaining water service connections. The BUYER shall at no additional cost to the SELLER, provide all facilities necessary to convey the water from the source to the points of use in accordance with the requirements of the Contract Documents.

Any water capacity charges and wet tap fees shall be paid by the SELLER. All charges for water use shall be paid for by the BUYER. The BUYER shall coordinate water testing of structures with other contractors on the site in an attempt to reuse water to the maximum extent possible.

- B. Water Connections: The BUYER shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system, and having paid the appropriate fees.

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3.6 INSTALLATION OF SANITARY FACILITIES

- A. Toilet Facilities: Portable chemical toilets shall be provided wherever needed for the use of BUYER'S employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction. A sanitary sewer is available in the area designated for the BUYER's field office trailer.
- B. Sanitary and Other Organic Wastes: The BUYER shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the BUYER or organic material wastes from any other source related to the BUYER'S operations shall be disposed of away from the site in a manner satisfactory to the SELLER and in accordance with all laws and regulations pertaining thereto.

3.7 INSTALLATION OF FIRE PROTECTION

- A. Fire Protection: All parts of the WORK shall be connected with the BUYER'S water supply system and shall be adequately protected against damage by fire. Hose connections and hose, water casks, chemical equipment, or other sufficient means shall be provided for fighting fires in the temporary structures and other portions of the WORK, and responsible persons shall be designated and instructed in the operation of such fire apparatus so as to prevent or minimize the hazard of fire. The BUYER'S fire protection program shall conform to the requirements of Article 34, Section 1805, b of Cal-OSHA, and Subpart F of the OSHA Standards for Construction.

3.8 OPERATIONS AND TERMINATIONS

- A. Inspections: Prior to placing temporary utility services into use, the BUYER shall inspect and test each service and arrange for governing authorities' required inspection and tests, and obtain required certifications and permits for use thereof.
- B. Protection: The BUYER shall maintain distinct markers for underground lines, and protect from damage during excavating operations.
- C. Termination and Removal: When need for a temporary utility service or a substantial portion thereof has ended, or when its service has been replaced by use of permanent services, or not later than time of substantial completion, the BUYER shall promptly remove installation unless requested by SELLER to retain it for a longer period. The BUYER shall complete and restore work which may have been delayed or affected by installation and use of temporary utilities, including repairs to construction and grades and restoration and cleaning of exposed surfaces.

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D. Removal of Water Connections: Before final acceptance of the WORK on the project, all temporary connections and piping installed by the BUYER shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the SELLER and to the agency owning the affected utility.

** END OF SECTION **

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SECTION 01520 - SECURITY & SAFETY

PART 1 - GENERAL

1.1 SECURITY PROGRAM

A. The BUYER shall:

1. Protect the WORK, from theft, vandalism, and unauthorized entry.
2. Initiate a site security program at the time of mobilization onto the worksite, which provides adequate security for site stored and installed material. The SELLER shall be the judge of what is considered adequate security. Considerations will include, but not be limited to:
 - High security locked container box in construction area; for material storage or off-site approved and bonded storage area
 - Structures designed with security locks must be capable of being secured with temporary or permanent high security locks prior to installation
3. Maintain the security program throughout the Contract duration.
4. The BUYER and Subcontractors are wholly responsible for the security of their storage compound and laydown areas, and for all their plant, material, equipment and tools at all times.
5. Provide the SELLER with a list of 24 hour emergency phone numbers.
6. Up-to-date inventory of plant material, equipment, and tools will be submitted to the SELLER as inventory arrives on site.

1.2 ENTRY CONTROL

A. The BUYER shall:

1. Restrict entry of unauthorized personnel onto the project site.
2. Allow entry only to authorized persons with proper identification.
3. Require all employees to sign the Employee Acknowledgment of MWWD Rules Log included at the end of this section. All employees, subcontractors, employees and lower tier BUYER employees will receive a new employee orientation, including viewing of the MWWD Program Safety Video and specific hazards and rules related to the job(s) the employees may be exposed to (Video will be provided by the SELLER). Signing the Employee Log by the employee is certifying that the orientation training has been received.

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4. The SELLER has the right to refuse access to the site or request that a person be removed from the site if found violating any of the project safety, security conduct rules.

1.3 RESTRICTIONS

The BUYER shall not allow cameras on site or photographs taken except with approval of the SELLER.

1.4 BUYER'S SAFETY PERSONNEL REQUIREMENTS

The BUYER shall assign a safety person. The qualified person will be experienced in heavy construction safety and health procedures

This person's duties and responsibilities will include hazard recognition; accident prevention; new employee orientation (including subcontractors); and the maintenance and supervision of the on-site safety program.

1.5 HAZARDOUS SUBSTANCES AND THE RIGHT TO KNOW

A. The BUYER shall:

1. Provide the SELLER with a list of all hazardous substances the BUYER anticipates he will bring on site.
2. Provide a Material Safety Data Sheet (MSDS) to the SELLER prior to arrival of any hazardous substances on the project. Refer to 6.18.7.1 of the General Conditions for additional information.
3. Submit for approval and implement a SPILL CONTROL PLAN to the SELLER. Refer to the MWWD Health and Safety Plan available from the MWWD Library for detailed requirements.
4. Stage storage area(s) must be approved by SELLER. Obtain approval of storage areas from the SELLER prior to storage of any hazardous materials.

1.6 JOB SAFETY ANALYSIS (JSA)

A. The BUYER shall:

1. Outline the sequence of the work, equipment to be used, identify hazards that may exist or may be created and what procedures and/or safety equipment will be used to eliminate or reduce these hazards. A written SCOPE OF WORK JSA shall be prepared and submitted prior to the start of construction activities on the project. The name of the competent person assigned to this activity will be included in the JSA.

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2. Complete a written JSA, if requested by the SELLER for any activity which may be of an unusual nature or involves unique hazards (Refer to MWWD Program Safety and Health Plan).

1.7 REPORTS

A. The BUYER shall:

1. Provide to the SELLER copies of the BUYER's and subcontractor's:
 - a. first aid log (monthly)
 - b. OSHA 200 injury log (monthly)
 - c. certification of new employee orientation (monthly)
 - d. safety meeting reports and topics (monthly)
 - e. list of competent persons as required by Cal/OSHA and the Project Health and Safety Manual (when updated)
 - f. conduct weekly safety inspections with the SELLER safety representative. Deficiency reports will be returned in 48 hours indicating corrective actions taken
 - g. injury and accident reports will be submitted to the SELLER within 24 hours of any incident. IMMEDIATE notification to the SELLER of an accident is REQUIRED. Full cooperation with the SELLER accident investigation is required
 - h. provide SELLER with records of employee and supervisor training including subcontractors
 - i. provide SELLER with Safety and Health Plan
2. A monthly audit of the BUYER's safety records and performance will be conducted by the SELLER SAFETY SELLER'S. A BUYER's failure to mitigate hazards may be cause for delaying the approval of the monthly progress payment request.

1.8 MWWD HEALTH AND SAFETY PLAN

- A. The SELLER has prepared a Program Safety and Health Manual.
- B. The Program Safety and Health Manual sets forth basic responsibilities, guidelines, rules, and regulations for all personnel involved in the construction of the Metropolitan Wastewater Department (MWWD) Projects. The manual does not cover the full spectrum of the published safety and health standards which are mandated by law.
- C. In the event of a conflict between the provisions of the Manual and applicable local, state or federal safety and health laws, regulations and/or standards, or the Contract Documents; the more stringent shall apply.

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1.9 PROJECT SITE SECURITY SERVICES AND ACCESS CONTROL

A. The BUYER shall:

Monitor the passage of personnel, vehicles, materials and equipment entering and leaving the site.

B. Other duties:

The BUYER will respond to requests from the SELLER to perform additional duties as follows:

1. Direct emergency vehicles or equipment to an on-site location.
2. Monitor labor action and document events, direct personnel, vehicles, materials, and equipment.
3. Monitor security for equipment and/or material temporarily stored along the access road or in the parking area.
4. Maintaining record of insurance files for all vehicles permitted on-site.
5. Maintaining daily security report files.
6. Notify the SELLER of security violations and enter all facts regarding the incident in the Security Log. The Security Log shall be transmitted to the designated SELLER's representative on a daily basis on the day following the last shift in the daily security report.
7. Assist the SELLER Safety/Security SELLER'S to remove personnel denied access to the site for violation of site regulations.
8. Inspect construction area lighting on a daily basis and report deficiencies to the SELLER.
9. Call the designated SELLER's representative to report a fire, hazardous material spill, or medical emergency. Report the emergency to the fire department as directed by the SELLER.
10. Notify the SELLER of all unusual activities/occurrences.

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1.10 SELLER'S SAFETY RESPONSIBILITIES

- A. The SELLER is responsible for the overall coordination and implementation of safe WORK practices and the maintenance of a safe WORK environment at the various construction sites under its control.
- B. In order to meet its safety requirements, the SELLER must rely upon the efforts of such BUYER to maintain a safe and healthful WORK environment for its employees and the employees of its lower tier BUYERS.
- C. The SELLER shall make periodic inspections of each BUYER'S WORK area. When possible, these inspections shall be made in conjunction with the BUYER'S site safety representative. Written reports of all such inspections shall be presented to the affected BUYER.
- D. The SELLER has authority to take the following actions in the name of the SELLER to maintain a safe and healthful WORK environment from craftsmen and others employed at the construction sites:
 - 1. When presented with instances of imminent danger situation, i.e., activities which could result in death or serious physical injury to the employees or involve the general public, the SELLER has the authority to stop the WORK until such time as corrective action is taken to eliminate the hazard. In exercising this authority, the BUYER shall have no recourse against either the SELLER or the SELLER for any damages that may arise as a result of such stoppage. Established WORK schedules, contract milestones, or contract completion dated will not be extended to accommodate the period of any such stoppage.
 - 2. The SELLER shall have the authority to effectively recommend to the SELLER the removal from the site of any person who is regarded as a frequent violator of safe WORK practices, or who fails to ensure persons working under their supervision or in a WORK place they control are not exposed to serious WORK hazards.
 - 3. When confronted with a non-imminent danger violation, the SELLER will advise the responsible BUYER of the condition, and obtain a date from that BUYER by which the non-imminent danger condition will be abated. In addition, the responsible BUYER will erect a temporary barrier or adopt other means to prevent the exposure of its employees and others to the non-imminent danger condition. If the responsible BUYER fails to take corrective action by the identified abatement date, the SELLER has authority to retain the necessary craftsmen to perform the WORK with the costs for all such labor and material being back charged against the responsible BUYER. In exercising this authority, the BUYER shall have no recourse against either the SELLER or the SELLER for any damages that may arise as a result of such stoppage. Established WORK schedules, contract

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milestones, or contract completion dated will not be extended to accommodate the period of any such stoppage.

- E. The SELLER will assist the City of San Diego Metro Wastewater Department in the inspection of the construction projects and enforcement of identified violations.
1. The SELLER will assist the City of San Diego with their inspection.
 2. The SELLER will notify the effected BUYER of the violations and date for corrective action.
 3. If a BUYER fails to correct the violations in the time allotted. A Safety Notice of Non-Compliance will be issued giving the BUYER 24 hours to comply.
 4. Failure to correct these violations will result in the SELLER retaining services from others to correct the violations and charges back the responsible BUYER.
- E. The BUYER will indemnify the SELLER and SELLER against fines, reasonable attorneys' fees, and defense costs resulting from citations issued to the SELLER by either federal, state, or local safety enforcement agencies due to the BUYER'S failure to abide by applicable safety and health standards.

PART 2 - PRODUCTS AND PLANS

2.1 BUYER Safety and Security Plan

- A. Prior to the performance of any work the BUYER will submit to the SELLER for review and comment two copies of a contract specific Safety/Health and Security Plan signed by an officer of the BUYER's organization. Adequacy is the responsibility of the BUYER.

The SELLER will not review the BUYER's safety plan for the adequacy of the plan.

The plan shall:

1. Identify the person(s) responsible for implementation and enforcement of Safety/Health and Security rules and regulations for this project.
2. Generally address safe work procedures for the activities within the BUYER's scope of work.
3. Included a new employee orientation program which addresses job and site specific rules, regulations and hazards (refer 01520.2).
4. Include the BUYER's Drug Free Work Place Policy.

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5. Include provisions to protect all of the BUYER's employees, other persons and organizations who may be affected by the work from injury, damage or loss.
 6. Comply with current OSHA, Cal OSHA, Project Health and Safety Manual, facility safety program (when applicable), and locally accepted safety codes, regulations and practices.
 7. Assign a qualified, experienced site safety person. This person's resume shall be submitted to the CM for review and acceptance. For requirements see Specification Section 01520.
 8. Include a site specific emergency action and evacuation plan.
 9. Include Hazard Communication/Right To Know Program (refer to 01520).
 10. Include security procedures for the BUYER's work, tools, and equipment.
 11. Include the capability of providing the SELLER with documentation to show compliance with their plan, plus accidents and investigation reports (refer to section 01520, Safety and Security).
 12. Address any other contract specific requirement.
- B. Provide a Job Safety Analysis (JSA) for the scope of work, prior to the start of work.
- C. Review of the BUYER's Safety Plan by the SELLER shall not impose any duty or responsibility upon the SELLER for the BUYER's performance of the work in a safe manner.
- However, if the plan is found by the SELLER not to meet the requirements established by OSHA, Cal OSHA, the Project Safety Manual, or other applicable codes and regulations, the Plan will be returned for revision. Acceptance of this Plan by the SELLER is required prior to the start of any site activity. Requests for additional contract time or compensation associated with delays in acceptance of the Plan, start of the work, or implementation of the Plan will not be approved by the SELLER.
- D. The BUYER shall be fully responsible for the safety and health of its employees, its subcontractors and lower tier BUYERs during performance of its work.
- E. The BUYER shall provide the SELLER with all safety reports, training records, competent person list, and accident reports prepared in compliance with Cal OSHA and the Project Health and Safety Plan.

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- 2.2 Written Job Safety Analysis required by this Section.
- 2.3 Reports required by this Section.
- 2.4 Safety representative qualifications required by this Section, Paragraph 1.4

PART 3 - EXECUTION (Not Used)

000218 SECTION 01530 - PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.1 GENERAL

The BUYER shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such Damage or temporary relocation, all in accordance with requirements of the Contract Documents.

1.2 EXISTING UTILITIES AND IMPROVEMENTS

A. General: The BUYER shall protect all Existing Utilities and other improvements which may be impaired during construction operations. It shall be the BUYER'S responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The BUYER shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

B. Utilities to be Moved: In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the BUYER, be notified by the SELLER to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the BUYER shall notify the SELLER a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

C. Where the proper completion of the WORK requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, the BUYER shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the SELLER and the Seller of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the BUYER in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.

D. SELLER's Right of Access: The right is reserved to the SELLER and to the Cities of public utilities and franchises to enter at any time for the purpose of making changes in their property made necessary by the WORK of this Contract.

E. All costs of locating, repairing damage not due to failure of the BUYER to exercise reasonable care, and removing or relocating such utility facilities not shown in the Contract Documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such work will be paid for as extra work in accordance with the provisions of Article 10 of the General Conditions.

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- F. Approval of Repairs: All repairs to a damaged improvement are subject to inspection and approval by an authorized representative of the utility or improvement Seller before being concealed by other work.
- G. Maintaining in Service: All power, and telephone or the communication cable ducts, gas and water mains and communication wires and cables encountered along the line of the WORK shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the SELLER are made with the Seller of said pipelines, duct, or wire or cable. The BUYER shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

1.3 NOTIFICATION BY THE BUYER

Prior to any work in the vicinity of any existing utilities, including all water, gas, all electric power, communications, or television cables; the BUYER shall notify the SELLER not less than three (3) days nor more than seven (7) days prior to work so that a representative of Building Maintenance SELLER can be present during such work, if they so desire.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

** END OF SECTION **

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SECTION 01550 - SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.1 HIGHWAY LIMITATIONS

- A. The BUYER shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the WORK. It shall be the BUYER'S responsibility to construct and maintain any haul roads required for its construction operations.

1.2 BUYER'S WORK AND STORAGE AREA

- A. If necessary, the SELLER will designate and arrange for the BUYER'S use, a portion of the property for its exclusive use during the term of the Contract as a temporary laydown area for its construction operations relative to this contract.
- B. The BUYER shall make its own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the WORK.
- C. The BUYER shall construct and use a separate storage area for hazardous materials used in constructing the WORK.
 1. For the purpose of this paragraph, hazardous materials to be stored in the separate area are all products labeled with any of the following terms: Warning, Caution, Poisonous, Toxic, flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, two-part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
 2. The BUYER shall develop and submit to the SELLER a plan for storing and disposing of the materials above.
 3. The BUYER shall obtain and submit to the SELLER a single EPA number for wastes generated at the site.
 4. The separate storage area shall meet all the requirements of all authorities having jurisdiction over the storage of hazardous materials. Such authorities are: Cal-OSHA, SDAPCD, San Diego County Health Department, Regional Water Quality Control Board, and City of San Diego Industrial Waste Division.

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5. The separate storage area shall be inspected by the City of San Diego Hazardous Materials Management Division prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.
6. All hazardous materials which are delivered in containers shall be stored in the original containers until use. Hazardous materials which are delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.

1.4 PARKING

- A. Available parking on site is limited. The BUYER maybe required to encourage employees to carpool whenever practical. The BUYER shall:
 1. The BUYER shall direct its employees to park in areas indicated as directed by the SELLER.
 2. Traffic and parking areas shall be maintained in a sound condition, free of excavated material, construction equipment, mud, and construction materials. The BUYER shall repair breaks, potholes, low areas which collect standing water, and other deficiencies.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION (Not used)

** END OF SECTION **

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SECTION 01560 - TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 AIR QUALITY

- A. General: The BUYER shall not create significant direct air quality impacts during the performance of the WORK. The BUYER shall take corrective measures, as required by the SELLER, to prevent significant air quality impacts during the work period.
- B. Equipment Control: All motorized construction vehicles operating onsite for more than 90 days shall have a low NOx emission engine tuneup. Documented proof of tuneups shall be made available to the SELLER when requested.
- C. Management: The BUYER shall encourage ride sharing among BUYER personnel and shall develop a voluntary ride share program.

1.2 RUBBISH CONTROL

- C. During the progress of the WORK, the BUYER shall keep the site of the WORK and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. The BUYER shall provide sufficient dumpsters and trash containers for collection of rubbish. The BUYER shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals, at least weekly, for collection and disposal of such materials and waste. The BUYER shall also keep all roads free from dirt, rubbish, and unnecessary obstructions resulting from *its operations*. *Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.* The BUYER shall not dispose of rubbish or debris into storm drains or stream channels.

1.3 SANITATION

- A. Toilet Facilities: Portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes: The BUYER shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the BUYER or organic material wastes from any other source related to the BUYER'S operations shall be disposed of away from the site in a manner satisfactory to the SELLER and in accordance with all laws and regulations

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pertaining thereto.

1.4 CHEMICALS

1. All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall be stored in accordance with the manufacturer's instructions. The BUYER shall maintain copies of Material Safety Data Sheets for all chemicals used or furnished by the BUYER. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer
2. All chemicals used during the project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, fertilizer, disinfectants, polymers, reactants, fuel, oil, hydraulic fluid, detergent, paint, solvent, glue, or any other classification, shall be stored within a containment area that minimizes contact of the chemicals and the storage containers with precipitation and surface water flows due to precipitation or flows from adjacent areas. If precipitation or surface water flows contact the chemicals or the storage containers, the BUYER shall notify the SELLER to determine if the surface water has been contaminated or may be allowed to be discharged to the storm drains or stream channels. If the surface water flows have become contaminated due to contact with the chemicals or the storage containers, the BUYER shall provide for removal and/or treatment of the surface water flows at no additional costs to the SELLER. If spills occur in the containment area, the BUYER shall immediately notify the SELLER and shall contain and cleanup the spill to prevent spilled material from entering storm drains, stream channels, or groundwater or from being absorbed by the underlying pavement or soil.
3. All chemicals shall be stored, handled, and used in compliance with the appropriate regulatory agency requirements.

1.5 HAZARDOUS MATERIALS

- A. The BUYER shall collect waste oil, used oil filters, other waste petroleum materials, and any other BUYER generated hazardous materials. Remove and legally dispose of all waste petroleum products and any other BUYER generated hazardous materials at suitable disposal facilities off of the job site at the BUYER'S expense.
- B. On site temporary fuel storage facilities shall be constructed to comply with current regulations. Such facilities shall be diked to contain any fuel spills. Fuel tanks shall be properly grounded.
- C. The BUYER shall park construction vehicles in locations designated by the SELLER.

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The BUYER shall provide oil drip pans to contain any oil leakage from construction vehicles.

1.6 TRAFFIC CONTROL

- A. Work Hours: Normal work hours shall be from 7:00 a.m. to 3:30 p.m.
- B. Truck Traffic: The BUYER shall schedule truck deliveries and hauling to and from the construction site prior to 4:30 p.m. on weekdays. Truck deliveries or hauling on weekends or holidays shall require prior approval by the SELLER.

1.3 PROGRESS CLEANING

- A. The BUYER shall maintain areas free of waste materials, debris, and rubbish. The site shall be maintained in a clean and orderly condition. Broom all concrete or other finished work areas at least once per month, prior to each progress payment request. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, shoreline areas or elsewhere, remove such material or debris and legally dispose of it during the progress of the WORK.
- B. Remove debris and rubbish from channels, wet wells, clarifiers, pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

1.4 SITE MAINTENANCE

The BUYER is responsible for site maintenance in the BUYER's work area, laydown area, and in all areas impacted by the BUYER's work activities. Such site maintenance activities include but are not limited to rubbish control, fence repair, and maintenance of construction parking lots, maintenance of erosion, and sediment control facilities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

** END OF SECTION **

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SECTION 01570 - TRAFFIC REGULATION

PART 1 - GENERAL

1.1 GUIDANCE

- A. The BUYER shall comply with the guidance provided by the Local Authorities, the State Department of Transportation, Specification Requirements, Permit Restrictions, and any other Governing Source, when regulating traffic on public roads.

1.2 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and SELLER'S operations.
- B. Monitor parking of construction personnel's vehicles. No personal vehicles will be permitted beyond the designated construction parking area. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

** END OF SECTION **

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SECTION 01600 - PRODUCTS, MATERIALS, EQUIPMENT, AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 DEFINITIONS

- A. The word "Products," as used herein, is defined to include purchased items for incorporation into the WORK, regardless of whether specifically purchased for the project or taken from BUYER's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.
- B. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying and erection of the WORK.

1.2 QUALITY ASSURANCE

- A. Source Limitations: To the greatest extent possible for each unit of work, the BUYER shall provide products, materials, and equipment of a singular generic kind from a single source.
- B. Compatibility of Options: Where more than one choice is available as options for BUYER's selection of a product, material, or equipment, the BUYER shall select an option which is compatible with other products, materials, or equipment. Compatibility is a basic general requirement of product, material and equipment selections. Where similar products (such as grease fittings, flexible couplings, etc.) are used on different pieces of equipment or in different areas within the WORK, standardize the products by providing all products from the same supplier.

1.3 PRODUCTS

- A. General: Only products meeting the indicated requirements shall be provided.
- B. Manufacturers: Products shall be new, of current manufacture, and shall be the products of reputable manufacturers specializing in the manufacture of such products who have had previous experience in manufacturing similar products.

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- C. Products: Materials shall be suitable for the intended purpose and free of defects and shall be recommended by the manufacturer for the application indicated. Where a specific manufacturer or manufacturer's model number is indicated, the equipment shall be modified, as necessary, to comply with the specified features, materials, performance and functions.

1.4 PRODUCT DELIVERY AND STORAGE

- A. The BUYER shall deliver and store all products in accordance with manufacturer's written recommendations and by methods and means which will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at site and overcrowding of construction spaces. In particular, the BUYER shall ensure coordination to ensure minimum holding or storage times for flammable, hazardous, easily damaged, or sensitive materials to deterioration, theft, and other sources of loss.

1.5 TRANSPORTATION AND HANDLING

- A. Products shall be transported by methods to avoid damage and shall be delivered in undamaged condition in manufacturer's unopened containers and packaging.
- B. The BUYER shall provide equipment and personnel to handle products, materials, and equipment including those provided by SELLER, by methods to prevent soiling and damage.
- C. The BUYER shall provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

1.6 STORAGE AND PROTECTION

- A. Products shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible. Sensitive products shall be stored in weather-tight climate controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.
- B. For exterior storage of fabricated products, products shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.
- C. Storage shall be arranged to provide access for inspection. The BUYER shall periodically inspect to assure products are undamaged and are maintained under required conditions.

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- D. Storage shall be arranged in a manner to provide access for maintenance of stored items and for inspection.

1.7 MAINTENANCE OF STORAGE

- A. Stored products shall be periodically inspected on a scheduled basis. The BUYER shall maintain a log of inspections and shall make the log available on request. On equipment placed in storage, permanently attach protective procedures to be taken, the date work is actually performed, and signature of the BUYER's technician actually performing the work.
- B. The BUYER shall comply with manufacturer's product storage requirements and recommendations.
- C. The BUYER shall maintain manufacturer-required environmental conditions continually.
- D. The BUYER shall ensure that surfaces of products exposed to the elements are not adversely affected and that weathering of finishes does not occur.
- E. For mechanical and electrical equipment, the BUYER shall provide a copy of the manufacturer's service instructions with each item and the exterior of the package shall contain notice that instructions are included.
- F. Products shall be serviced on a regularly scheduled basis, and a log of services shall be maintained and submitted as a record document prior to acceptance by the SELLER in accordance with the Contract Documents.
- G. Provide protective maintenance during storage consisting of:
 - 1. Inspecting mechanical surfaces for signs of corrosion or other damage, lubricating, or applying any coatings as recommended by the equipment supplier for protection; and all other precautions for proper protection of all equipment stored.
 - 2. Providing compliance with suppliers' storage requirements to maintain warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

** END OF SECTION **

SECTION 01660 - FACILITY START-UP

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

- A. Start-up is defined as the initial operation of a facility and/or plant, utilizing solar radiation which the facility has been designed to process.
- B. The BUYER shall be required to start up the facility, under direction of the SELLER, operate it, and pass a eight (8) hour test prior to Substantial Completion. All equipment must properly run for the test period at rates indicated by the approved test plan. If any item malfunctions during the test, the item shall be repaired and the test restarted at day zero with no credit given for the operating time before the malfunction.
- C. The purpose of this eight (8) hour test is to:
 - 1. Provide the environment by which the BUYER can place equipment and systems into service.
 - 2. Expose flaws or defects in workmanship, equipment, or materials, not previously discovered that are the responsibility of the BUYER to repair, correct, modify, or replace, at the option of the SELLER, prior to Final Acceptance.

1.2 SERVICES OF MANUFACTURER.

- A. Manufacturer's services for inspection, physical checkout, field adjustment, field testing, and start-up shall comply with the requirements of this Section, the requirements of the particular equipment or product technical specifications, and the requirements of the following sections:
 - 1. Section 01680, Physical Checkout; Shop, Field, and Functional Testing
- B. Manufacturer's services for training and instruction of SELLER's personnel shall comply with the requirements of the particular equipment or product technical specifications.

1.3 ROLES AND RESPONSIBILITIES:

- A. BUYER'S responsibilities:
 - 1. Develop specific start-up plan.
 - 2. Schedule and coordinate with the SELLER for start-up of equipment and systems.

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3. Review outstanding punchlist items with the SELLER three (3) days prior to the scheduled start-up; and complete, correct, or resolve at the option of the SELLER, any items which impact or interfere with the facility start-up.
 4. Attend meetings related to the review of start-up plan.
 5. Clarify submittals, testing requirements, schedules, or other items related to the start-up of the equipment and facilities specified and indicated in the Contract Documents.
 6. Provide all start-up materials and operating supplies.
 7. Provide Supplier's authorized representatives as required to supervise placing equipment or systems in operation and provide guidance during the start-up period.
 8. Provide to the SELLER a list of twenty-four (24) hour, "on call" representative supervisory persons who will monitor the facility start-up, and serve as a liaison for the SELLER and the SELLER.
 9. Provide the necessary craft or labor assistance full time during the day shift and as required at other times in the event of an emergency requiring immediate attention. An emergency is defined as a failure which precludes the further operation of a critical segment of; or the whole of the WORK. The response time shall be not less than four hours from the time of notification.
 10. Correct all failures or equipment problems identified during start-up when notified by the SELLER. Repairs deemed the responsibility of the BUYER shall be made at no additional cost to the SELLER.
 11. Provide training of SELLER'S personnel as specified.
- B. The SELLER's responsibilities during the facility start-up period include the following:
1. Support the facility start-up activities.
 2. Provide trained staff to operate and maintain SELLER'S equipment, systems, and facilities required during start-up.
 3. Provide all utilities including power, natural gas, and water, as needed.
- C. The SELLER's responsibilities for the facility start-up period include the following:

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1. Coordinate the start-up.
2. Assisting the BUYER in developing specific start-up schedule(s).
3. Verify the results of performance tests and any retesting.
4. Assist the SELLER in the evaluation of performance test results and retesting.
5. Direct the BUYER to repair defective workmanship, materials, and equipment.

1.4 DELAYED START-UP

A. In the event the equipment, systems and facilities provided under this Contract, are unable to enter the "start-up" phase as defined herein prior to the Contract completion date, due to circumstances beyond the control of the BUYER, the SELLER may direct the BUYER, in writing, to provide the following. A change order will be prepared for the cost of the following items if the delayed start-up is due to circumstances beyond the control of the BUYER.

1. Prepare and submit a plan to the SELLER for placing and maintaining the WORK in a state of "protective maintenance." The plan will define extended storage and preventive maintenance requirements for a period up to and including one (1) year. The SELLER will review and approve the plan. Details of the plan shall include the following:
 - a. Procedures and schedules for extended storage, equipment protection, equipment rotation, lubrication, and other requirements to place the WORK in a "protective maintenance mode".
 - b. Weather protection and security requirements for the facility and for the equipment.
 - c. Special requirements for damage protection or safety.
 - d. Requirements for storage and protection of auxiliary equipment and initial operating supplies.
 - e. Procedures, schedules, lubrication, calibration, recertification by suppliers, and other items required to return the WORK to a "start-up" condition.
2. In the event the start-up is delayed beyond the Contract completion date, the BUYER may be directed to prepare the protective maintenance plan described above, and to initially prepare the equipment and facility for mothballing in compliance with manufacturers' recommendations and the protective maintenance plan.

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- B. In the event the start-up is delayed beyond the Contract completion date, the BUYER shall be responsible for executing a preventative maintenance program for the facility and all equipment in accordance with the manufacturers' recommendations and the protective maintenance plan. The preventative maintenance program shall include such items as periodic rotation of equipment, lubrication, and temporary environmental controls, etc.
- C. In the event a delayed start-up plan is approved and accepted by the SELLER, and the BUYER is directed in writing by the SELLER to proceed with implementation, the SELLER will prepare a delayed start-up punchlist which defines the items and services which are not completed due to delayed start-up, and their value.

1.5 EARLY COMPLETION

- C. In the event the BUYER completes all contractual work prior to the Contract completion date, except for items associated with facility start-up, the BUYER shall protect and maintain the entire facility and all equipment in accordance with the manufacturer's recommendations. The cost of any such preventive maintenance activities shall be borne by the BUYER through the Contract completion date.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

** END OF SECTION **

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SECTION 01680 - PHYSICAL CHECKOUT: SHOP, FIELD, AND FUNCTIONAL TESTING

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. The physical inspection and testing requirements in this Section are in addition to those requirements defined in the pertinent technical documents. These activities shall be performed prior to substantial completion.
- B. Provide the following checkout and testing activities:
 - 1. Shop Testing of equipment as specified herein.
 - 2. Physical checkout and inspection of equipment and materials to verify conformance of the installed equipment and materials to the Contract Document.
 - 3. Field Testing of equipment as specified herein.
 - 4. Functional Testing of equipment as specified herein.
- C. Provide a Checkout Plan covering the entire checkout and testing process in conformance with the Contract Documents, and as specified herein.

1.2 DEFINITIONS:

- A. Shop Testing is defined as testing that is done by the Supplier either at the place of manufacture, the place of assembly, or at another location where the required testing apparatus is located, for the purpose of proving that the Products meet the requirements of the pertinent technical specification(s). The administrative procedures for shop testing are specified in paragraph 1.7 of this Section, while the technical requirements are included in the pertinent technical documents. The minimum acceptable test criteria are specified in paragraph 1.5 of this Section.
- B. Physical Checkout is defined as the process of physically inspecting Products after they have been installed to determine if the Products have been properly and completely installed, comply with the approved shop drawings and are ready for Field and/or Functional Testing. The requirements for Physical Checkout are contained in the pertinent technical documents and in paragraph 1.9 of this Section.

- C. Field Testing is defined as testing that is performed by the BUYER, and/or Subcontractors, with Supplier assistance, on Products after they have been installed, and after the performance of physical checkout, for the purpose of proving that the tested Products meet the requirements of the pertinent technical specifications. Field testing is required regardless of whether or not shop testing was performed on the same piece of equipment or material. The administrative requirements for field testing are specified in paragraph 1.8 of this Section, while the technical requirements are contained in the pertinent technical documents. The minimum acceptable test criteria are specified in paragraph 1.5 of this Section.
- D. Functional Testing is defined as testing performed by the BUYER on a "system" normally comprised of two or more pieces of equipment, after the equipment has been installed, and after Physical Checkout and Field Testing have been completed, for the purpose of proving that the system meets requirements as specified and as indicated. The administrative requirements for Functional Testing are specified in paragraph 1.11 of this Section, while the technical requirements are specified in the technical documentation.
- E. The Supplier's Representative or Manufacturer's Representative is defined as a person, or persons provided by the Supplier, who is qualified by having the training and experience, to provide technical and/or process related advice, and/or assistance, relating to the installation or utilization of the Products provided by that same Supplier. The Supplier's Representative or Manufacturer's Representative shall be a Professional Engineer registered in the discipline most appropriate for the product provided or approved by the SELLER.
- F. The Testing, Checkout, and Start-Up Coordinator is defined as the person provided by the BUYER to coordinate and oversee the total spectrum of testing and inspection activities required by the Contract Documents. The Testing and Checkout and Start-Up Coordinator shall be a Professional Engineer registered in the discipline most appropriate for the equipment to be tested and checked out or approved by the SELLER.

1.3 ROLES and RESPONSIBILITIES:

- A. The BUYER shall provide all outside services, materials, labor, supplies, test equipment and other items necessary to perform the testing specified herein and interim connections. In addition the BUYER shall arrange for and provide the participation or assistance of survey crews, engineers, quality control technicians, Suppliers' and/or Manufacturer's representative(s), and required utility, regulator, or governmental agency representatives.

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- B. The BUYER shall provide the services of the Supplier's and/or Manufacturer's representative(s) as follows:
1. Shop Testing as specified herein.
 2. Assistance during installation.
 3. Field Testing as specified herein.
 4. Functional Testing as specified herein.
- C. The Supplier's and/or Manufacturer's representative activities required by this Section are in addition to the requirements for vendor training and other services specified elsewhere in the Contract Documents. Timing for the performance of these services shall be defined in the Checkout Plan, specified herein.
- D. The SELLER and/or SELLER may review and comment on the BUYER's deliverables, participate in the physical inspection activities, witness the shop and field testing, witness loop checks, witness functional testing, and provide verification of conformance to the specifications.
- E. The BUYER shall be responsible for incorporating these procedures into the CPM schedule. No additional time or compensation will be approved relating to delays associated with these requirements.

1.4 WITNESSING OF TESTS

Unless otherwise noted, provide a minimum of 7 days written notice to the SELLER so that the SELLER, the SELLER, or its representatives may have the opportunity to witness the Shop tests, Field tests, Loop checks, and Functional tests. The SELLER and the SELLER may witness the performance of any or all tests, at their option. The SELLER's or SELLER's witnessing of tests does not relieve the BUYER of its obligation to comply with the requirements of the Contract Documents.

1.5 CHECKOUT PLAN

- A. The BUYER shall submit a Checkout Plan based upon the requirements defined herein, and the Technical Documentation to the SELLER. Six (6) copies and 1 (one) copy on electronic media (WordPerfect) of the preliminary Checkout Plan shall be submitted for review within 30 days of the Notice to Proceed or 60 days prior to the proposed date of the first test, whichever occurs first. The plan shall define:
1. The equipment and applicable technical documents for the equipment
 2. The logical and systematic performance of physical inspections, shop tests, field tests, loop checks, and functional tests including:

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- a. A chronological schedule of all testing, checking, and inspection activities.
 - b. A checklist of all inspection, checking, and testing activities broken down by location, discipline, system, and device or item.
 - c. All blank forms proposed by the BUYER for verification or recording for all testing.
 - d. An index which cross references the forms to their intended application(s).
 - e. A list of all shop tests, and supplier certifications, including those required by the applicable technical documentation. Provisions shall also be included for re-testing, in the event it is required.
3. Participants in the testing.
 4. Special test equipment.
 5. Sources of the test media (water, power, air).
 6. The proposed method of delivery of the media to the equipment to be tested.
 7. Temporary or interim connections for the sequencing of multiple units.
 8. Ultimate proper disposal of the test media.
- B. The plan will be reviewed by the SELLER, modified or revised within 15 days as necessary by the BUYER, then approved by the SELLER. The BUYER shall continue to update the Checkout Plan, working in conjunction with the SELLER prior to the start of the scheduled equipment checkout and functional testing activities. Each specific element of the plan must receive written approval by the SELLER at least two weeks prior to the actual commencement of testing.
- C. The BUYER shall designate, in the Checkout Plan, a Testing, Checkout, and Start-Up Coordinator, to coordinate and manage the activities defined in the checkout plan, as approved by the SELLER.

1.6 PHYSICAL CHECKOUT AND INSPECTIONS

- A. Physical Checkout and inspections provide verification of conformance to the requirements of the Technical Documentation and Contract Drawings for physical presence; dimensions; and location, for proper materials, parts, and items; and for integrity of materials, equipment and systems to determine their condition and readiness for field and/or functional testing. Inspection includes the following elements, as applicable.

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1. Piping systems for material, size, components, direction, alignment of joints and bolting/welding, valves, packing and seals, screens, filters and strainers, painting, identification labeling and color coding, hangers, anchors, supports, and expansion provisions.
 2. Electrical and control/instrumentation systems for conduit and tray installation, wire/cable material and size, circuit identification, terminal installation and identification, major switches, circuit breakers and components, and labeling for system identification.
- B. Inspection will verify that pipes, conduits, equipment, systems, areas and other items provided under the Contract are clean and free from debris or materials which may interfere with subsequent testing requirements or routine operations. Correct unsatisfactory conditions prior to testing or acceptance.
- C. Upon completion of the inspection, submit to the SELLER six copies of each completed inspection form, signed by an authorized representative of the BUYER who participated in the inspection. The SELLER will review and approve the contents of the forms. Should a re-inspection be required, it shall be performed at no additional cost to the SELLER.

1.7 FIELD TESTING OF EQUIPMENT

- A. **BUYER Personnel:** The BUYER shall provide the services of an experienced and authorized Supplier's or Manufacturer's representative for each item of equipment indicated in the equipment schedules, who shall visit the site of the WORK and inspect, check, adjust if necessary, and approve the equipment installation. In each case, the BUYER shall arrange to have the Supplier's or Manufacturer's representative revisit the job site as often as necessary until any and all trouble is corrected and the equipment installation and operation are satisfactory to the SELLER. The BUYER shall notify the SELLER of the visit of the Supplier's or Manufacturer's representative at least 48 hours in advance of arrival at the work site.
- B. **BUYER'S Report:** The BUYER shall deliver to the SELLER a written report prepared by the Supplier's or Manufacturer's representative, addressed to the SELLER, certifying that the equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts, and has been operated satisfactorily under full-load conditions. The Supplier's or Manufacturer's representative shall also provide written authorization that the equipment can be operated. This report shall be submitted within 7 days of the Supplier's or Manufacturer's representative visit to the site.
- C. **Scheduling Tests:** The BUYER shall be responsible for scheduling all field testing. The BUYER is advised that the SELLER and the SELLER's operating personnel will witness field testing and that the Supplier's or Manufacturer's representative shall be required to instruct the SELLER's operating personnel in the correct operation and

maintenance procedures. Such instruction shall be scheduled at a time arranged with the SELLER at least 2 weeks in advance, and shall be provided while the equipment is fully operational. On-site instruction shall be given by qualified persons who have been made familiar in advance with the equipment and systems in the plant. Thirty (30) days prior to scheduling any field testing, the BUYER shall have previously received approval of the SELLER'S Manuals required under Section 01300. No field testing will be permitted if this requirement is not met. Any associated delays to the completion of the contract resulting from delayed testing due to incomplete or unapproved SELLER'S manuals will be the responsibility of the BUYER.

D. **Test Support:** The BUYER shall furnish all personnel, power, water, chemicals, fuel, oil, grease, and all other necessary equipment, facilities, temporary and interim connections, and services required for conducting the tests and shall properly dispose of all material, media, and lubricants upon completion of the test.

F. **Notice Requirement:** Field testing shall be in addition to, and not in lieu of, shop testing. Field testing will be performed as a part of the overall physical and functional testing process defined herein and in accordance with the approved Checkout Plan. However, as a minimum the following specific instructions shall also apply. The BUYER shall provide 7(seven) calendar days written notice indicating the date and time for testing each piece of equipment, or a series of equipment pieces.

1. All equipment installed by the BUYER shall undergo an operational check by the BUYER to verify that the equipment is functioning (electrically, mechanically and structurally) as it has been installed.
2. Each device shall be operated through its full range of motion and each instrument shall be checked against its full span.
3. At a minimum, this check shall include turning the equipment on and running it through one full cycle. This cycle shall include all operating possibilities. Signals or interlocks from other pieces of equipment may be simulated upon prior approval of the SELLER.

G. **Review of Procedures:** Field test procedures will be reviewed and returned by the SELLER within 7 (seven) days of receipt. Incorporate minor comments to the procedures, equipment, or personnel prior to testing. Major comments by the SELLER will require a resubmission of the field test procedure and proposed test date. The BUYER will be notified, in writing, by the SELLER if a formal resubmission is required with the transmittal of the review comments.

H. **Additional Notice Requirements:** Provide 7 (seven) day's written notice to the SELLER prior to the actual start of any testing. This will include a statement by the BUYER that the equipment and facilities to be tested have been thoroughly inspected and cleaned of construction debris or other extraneous materials and all lubrication, materials, and preparations are completed.

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- I. **Test Report Requirements:** At conclusion of the test the BUYER will deliver draft test report data, and then submit, within 7 (seven) days after completion of the tests, 6 (six) copies of the following to the SELLER for approval:
 1. Completed test forms, for each device tested, on forms provided by the BUYER prior to the tests.
 2. Completed certification documentation, the content of which was approved prior to the tests.
 3. A written summary of the test; a report of the results and a summary of the entire procedure.
 4. A schedule for retesting, if necessary. Perform any retesting required to fulfill the intent of the technical specification test requirements at no additional cost to the SELLER.

1.8 FUNCTIONAL TESTING

- A. When listed in Appendix A of this Section, specific functional tests shall be performed by the BUYER who supplied the equipment being tested in addition to the requirement for shop, field, and other tests called for in the Technical Documentation.
- B. The BUYER shall provide 15 days written notice in accordance with Section 1.6, indicating the date and time during which the specified functional test is proposed. Submit with this notice a contract specific functional test plan which follows the generic functional test plan included in the contract, and which includes the following to the SELLER for approval:
 1. Description of the system's equipment, piping, valves, instruments and other components, and the applicable specification sections.
 2. Test procedures to be provided by Engineer.
 3. Testing devices that will be used in the tests: Description must state what portion of the tests that the devices will perform or measure, and device accuracy. Submit sample measurement results and catalog cuts.
 4. Personnel used to perform the tests: Submit resumes and qualifications. As a minimum, personnel must have three years experience with the operation of the equipment and/or system to be tested and have participated in five similar tests during this period of experience.

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5. Schedule for Testing: Schedule shall include frequency of measurements, personnel present, and contingency plans for equipment and/or system test failure.
 6. Test forms: Provide test forms for recording and reporting on the test data.
 7. Material and equipment required for the test.
 8. Utility requirements: Utility requirements will be identified and supplied by the BUYER for functional testing purposes. Provide labor for the reuse of the test water.
 9. Operational requirements: Include valve positions, set-ups, and gate positions that are required to run the tests in the written request so that the CM can anticipate and plan for the testing. Provide all temporary piping, connections or other temporary requirements related to performance of the functional tests.
- C. The BUYER will be obligated for installation and cost associated and cost associated with all temporary materials and systems required to facilitate functional testing.
- D. The SELLER, and the SELLER will direct specific actions when conflicts surface and will witness the performance of these tests.
- E. Approval of the functional test package by the SELLER will be made within two weeks of the test date. Incorporate minor comments on the procedures, equipment, and personnel prior to testing. Major comments by the SELLER will require a resubmission of the functional test package and test date.
- F. Provide seven (7) days written notice to the SELLER prior to the actual start of any testing. This will include a statement by the BUYER that the equipment and facilities to be tested have been thoroughly inspected and cleaned of construction debris or other extraneous materials and all lubrication, materials, and preparations are completed.
- G. Submit within seven (7) days after completion of the tests, 6 (six) copies of the following to the SELLER for approval:
1. Completed test forms, for each device, or system tested, on forms approved prior to the test.
 2. Completed certification, the content of which was approved prior to the tests.
 3. A written summary of the test; a report of the results and a summary of the entire procedure.
 4. A schedule for retesting, if necessary, including changes to procedures, testing devices, or personnel. Any retesting required to fulfill the intent of the test requirements due to negligence, poor workmanship, or Products that fail to meet the Contract requirements, shall be at no additional cost to the SELLER.

1.9 CORRECTIONS TO THE WORK

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Correct any items of work failing to meet the specified requirements, at no additional cost to the SELLER. Correct the nonconforming items by re-work, modification, or replacement, at the option of the SELLER. This includes the provision of all required labor, materials, and requirements for retesting as specified herein, to verify that the items conform with Contract Documents.

1.10 SAFETY

Conduct all specified test procedures in compliance with all applicable safety standards and regulations.

1.11 SUPPORT FOR FUNCTIONAL TESTING

If the operation of the BUYER's equipment is necessary to support the testing of other BUYERS' equipment, the SELLER may direct the BUYER, in writing, to provide operations support. A change order will be prepared for the cost of the following items:

- A. Prepare and submit an Operations Plan to the SELLER to provide for the operation and maintenance of their equipment to support the testing of other BUYERS' equipment. The plan will define all operations and maintenance requirements for a period up to and including six months. The SELLER will review and approve the Operations Plan. Details of the Operations Plan shall include the following:
 - 1. Standard Operating Procedures for starting, stopping, and routine operation.
 - 2. Procedures and schedules for the lubrication, calibration, and other items required to properly maintaining equipment.
 - 3. Utility requirements: Utilities to be supplied by the BUYER for operations support purposes.
- B. In the event an Operations Support Plan is approved and accepted by the SELLER, and the BUYER is directed in writing by the SELLER to proceed with implementation, the SELLER will prepare an operations punch list which defines the items and services which are not completed and their value. Retainage will then be reduced to the value of this incomplete WORK.

The one (1) year warranty period will not begin until final start-up and operation.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

** END OF SECTION **

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SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Contract Closeout is the process that commences as the WORK nears Substantial Completion. It continues through Substantial Completion, and Final Acceptance of the WORK.
- B. This specification section defines the overall changeover process from construction (by the BUYER) to plant operations (by the SELLER). This section defines the terms in this process, and outlines the responsibilities of the BUYER, the SELLER, and the SELLER.

1.2 CONTRACT CLOSEOUT SEQUENCE OF EVENTS

- A. The sequence of events and their description listed below represent the suggested order of activities as the Contract proceeds from construction, through checkout, testing, Substantial Completion, and the Notice of Completion. Not all work will proceed in this exact order. Adjustments may be made, after approval by the SELLER, for the mutual benefit of the BUYER and the SELLER, if the situation so warrants. Any adjustment made in the sequence of events, to accommodate the BUYER, shall be at no additional cost to the SELLER.
- B. Closeout Sequence of Events and Description
 - 1. Checkout Plan - The BUYER will prepare a Checkout Plan in accordance with Section 01680. This plan becomes the basis for all checkout, shop, field, and functional testing. It includes schedules, personnel, test media, and equipment requirements, and shall fully define the BUYER's intended checkout process.
 - 2. WORK Nears Completion - Signifies the start of checkout and testing. The BUYER shall indicate when work is ready for checkout and testing on a facility and/or system basis.
- 3. Contract Closeout Deliverables - The BUYER shall provide the following, in accordance with the Checkout Plan and as specified:
 - a. Shop testing in accordance with the technical specifications and Section 01680.
 - b. Field Testing in accordance with the technical specifications and Section 01680.
 - c. Physical Checkout in accordance with the Contract Documents and Section 01680.

- d. Functional Testing in accordance with the technical specifications and Section 01680.
 - e. SELLER's Manuals, in accordance with Section 01300.
 - f. Vendor Training, in accordance with the technical specifications.
 - g. Final Record Drawings, in accordance with Section 01050.
 - h. Written guarantees, where required.
 - i. Maintenance stock items; spare parts; special tools.
 - j. Copy of final sign off of all permits.
 - k. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
4. Pre-Final Inspection and Discrepancy List - The SELLER will conduct a pre-final inspection of the WORK prior to substantial completion. The SELLER will prepare a discrepancy list (punchlist). The discrepancy list includes items of work which do not conform to the Contract Documents, plus any additional items found to be missing, incomplete, damaged, incorrect, or constructed in an unworkmanlike manner. The BUYER shall correct all items on the discrepancy list.
 5. Operational Demonstration - The BUYER shall conduct an eight (8) hour Operational Demonstration of the facility in accordance with Section 01660 of the Specifications.
 6. Substantial Completion - Following correction of items on the discrepancy list, and successful completion of the operational demonstration, the BUYER shall notify the SELLER that the WORK is substantially complete. Refer to the General Conditions for other requirements for Substantial Completion.
 7. Final Inspection - Following written notice from the BUYER that the entire WORK is complete. The SELLER, the CITY, and the BUYER will conduct a final inspection to verify that the WORK is complete. The SELLER will prepare a final punchlist of all outstanding items.
 8. Notice of Completion - The SELLER will file a Notice of Completion with the County Recorder to begin the 30-day stop notice filing period.

1.3 SUBSTANTIAL COMPLETION

- A. Substantial Completion is defined in Article 5.12 of the Agreement.

000244. Substantial Completion includes compliance with the following requirements:

1. The BUYER has, substantially completed the construction and erection of the WORK in conformance with the Contract Documents.
2. The BUYER has installed, adjusted, and successfully tested Products and equipment. The facilities are constructed as indicated by the erection, installation, and operations and maintenance instructions of the Suppliers.
3. The BUYER has provided and completed the following items as approved by the SELLER:
 - a. Contract Closeout Deliverables.
 - b. Special Supplier's Warranties.
- C. Special Protective Maintenance Instructions for mothballed equipment.

1.4 PRE-FINAL AND FINAL INSPECTIONS

- A. Pre-final and final inspections are surveys of the BUYER's work by the SELLER and the SELLER in order to create a list of incomplete or unsatisfactory items of work.
- B. Prior to the pre-final and final inspections, the BUYER must complete the following:
 1. Clean equipment and fixtures by removing temporary labels, stains, dirt, and other foreign substances.
- B. Clean debris from pipes, roofs, gutters, down spouts, and drainage systems.
- B. Remove waste and surplus materials, rubbish, equipment, temporary utilities, and construction facilities from the site.
- C. The discrepancy list(s) and punchlist will include all items of work found to be unsatisfactory, missing, incomplete, damaged, incorrect, or improperly installed or constructed. Prior to Final Acceptance the BUYER shall correct the punchlist items by re-work, modification, or replacement, at the option of the SELLER and at no additional cost to the SELLER. The SELLER will reinspect punchlist items upon notice by the BUYER that they are complete.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FINAL CLEANUP

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The BUYER shall promptly remove from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the WORK by the SELLER will be withheld until the BUYER has satisfactorily complied with the foregoing requirements for final cleanup of the project site.

** END OF SECTION **

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Article I. EXHIBIT D

Project Schedule

See Exhibit C for Project Schedule

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Biogas Metering System, MMBTU Testing
and Conversion to Determine Base Price paid for Biogas

MEASUREMENT AND TESTING

Subject to the terms and conditions of this Agreement, Buyer, in accordance with Article 4.2, shall install, operate and maintain facilities, including suitable volumetric meters and equipment for the purpose of measuring the volume of all Biogas delivered by Seller to Buyer.

All volumetric measurements of Biogas shall be corrected from the actual pressures and temperatures to a pressure of fourteen and seventy-three hundredths (14.73) Psia, and a temperature of sixty degrees Fahrenheit (60°F), and shall be computed in accordance with the procedures established by the American Gas Association Gas Measurement Reports, as revised from time to time and subsequently adopted by the Buyer.

Buyer shall calibrate such meters, in accordance with Section 4.2 and Buyer's internal guidelines as to frequency and methods of calibration, and Seller may have its representative present at such calibrations. Seller shall have the right to request a special calibration of any meter at any reasonable time; however, if any such requested special calibration shows that the meter was registering within two percent (2%) accuracy, then the cost of such requested special calibration shall be borne by Seller. In the event any calibration of a meter does not register within two percent (2%) accuracy, the Buyer shall restore the metering equipment to a condition of accuracy in a reasonable time and the quantity of Biogas theretofore delivered and received shall be recalculated and corrected for any period where such inaccuracy was definitely known to exist. If the period of time is not definitely known, then such recalculation shall only be made for a period covering one-half of the elapsed time since the last calibration test.

Seller may install or cause to be installed and operate check meters at its option and expense to check Buyer's meters, but measurement of Biogas for the purpose of this Agreement shall be by Buyer's meters. Such check meters and equipment shall be installed so as not to interfere with the operation of the meters and measuring equipment required by Buyer.

Utilizing a mutually agreed upon independent testing laboratory, Buyer shall take Biogas samples in accordance with Section 4.3 at or reasonably close to the Point of Receipt and determine the MMBTU content ("Heating Value") of all Biogas delivered to Buyer by means of a gas chromatograph and calculations based on the chromatographic analysis of the Biogas, or such other methods that may be mutually agreed upon by Buyer and Seller. Seller shall have the right to request that additional Biogas sample be taken for re-determination of such Heating Value at any reasonable time; however, if any such requested additional testing shows that the previous test was within two percent (2%) accuracy, then the cost of such requested testing shall be borne by Seller. In the event any such additional testing shows that the previous test was not

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within two percent (2%) accuracy, then the cost of such requested testing shall be borne by Buyer and the Heating Value of Biogas therefore delivered and received shall be recalculated and corrected for any period where such inaccuracy was definitely known to exist. If the period of time of such inaccuracy is not definitely known, then such recalculation shall be made for a period covering one-half of the elapsed time since the last test results. The Buyer and Seller shall have the right to witness said independent testing with copies of said independent testing laboratory results to be given to all parties.

Both Buyer and Seller shall have the right to be present at the time of any installing, reading, cleaning, changing, repairing, inspecting, testing, calibrating, or adjusting done in connection with the other's measuring equipment used in measuring deliveries hereunder. The records from such measuring equipment shall remain the property of their owner, but upon request either party shall make available its records and charts, together with calculations there from, for inspection and verification by the other.

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EXHIBIT F
RATE ADJUSTMENT CALCULATION

Base Price (The term as used here, for this calculation, as it relates to terms in the BLS Report 807, includes premium, if applicable)	US\$ 1.10 per MMBTU and US\$ 0.25 premium if applicable
Index to be used for adjustment	U.S. Department of Labor's Consumer Price Index for the San Diego Metro Service Area
Initial Adjustment Date	July 1 st of Contract Year 6
Base Period Index	Annual average Index for the calendar year prior to the Initial Adjustment Date. (Contract Year five(5))
Subsequent Adjustment Dates	Annually, on July 1 st of each year following the Initial Adjustment Date
Adjustment Methodology	Divide the Annual Average index for the calendar year prior to the adjustment date by the Base Period Index, and then multiply by the Base Price.
Additional information	Method to be used follows the Simple Percentage Method as described by <i>BLS Report 807, Escalation and Producer Price Indexes: A Guide for Contracting Parties.</i>