

Specification Package
For
Waste Water Plant Refurbishment

Facility Number 1660

U.S. Navy Atlantic Undersea Test and Evaluation Center

Andros Island, Bahamas

Project Number R296-08

Work Order Number 950Y246



Revision Date: 1 October 2008

Section Number	Subpart Number	SD Number	Submittal Item	Date Submitted	Approving Authority	Acc/Rej	Date Accepted
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SECTION 01 11 00

SUMMARY OF WORK

07/06

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

Provide materials, equipment and skilled labor to perform a design-build for refurbishment of the Waste Water Treatment Plant at AUTEC Site 1, and perform incidental related work.

1.1.1.1 Definitions

The following definitions apply to all documents in this package:

Contracting Organization: The AUTEC Maintenance and Operations (M&O) Contractor, CSC Applied Technologies, LLC (CSC)

Subcontract Administrator/Buyer: The designated employee of Computer Sciences Corporation authorized to make contractual obligations for CSC for the work described herein.

Subcontractor: The company, organization, or individual contracted to perform the work described herein.

Project Engineer: The Engineer designated to be the technical lead for the project with overall responsibility for project design, construction management, and completion for CSC.

1.1.1.2 Background

The Wastewater Treatment Plant (WWTP), Facility number 1660, was constructed in 1979. The Wastewater Treatment Plant has a capacity to process 120,000 gallons per day, and currently averages approximately 70,000 gallons per day.

Exposure to the weather and normal operating conditions has resulted in deterioration of some key components. The rectangular clarifier and weir in the sludge collector tank, and the control box for the sump pump motor require replacement. The work on this contract is to repair this equipment by replacement with similar new equipment.

The plant consists of four aeration tanks, one clarifier settling tank, one digester tank, and one chlorinator tank. During the performance of the work for this contract up to two aeration tanks will be emptied and made available as clarifier tanks during replacement of the rectangular clarifier and weir. Use of the aeration tanks as clarifiers can only be performed on a short-term temporary basis, and the Subcontractor should plan to complete this portion of the work in as quickly as possible.

1.1.1.3 Statement of Work

The work in this document is an extract of the UFGS requirements, and the Subcontractor shall perform all work in accordance with these requirements.

The Subcontractor shall provide the skill, labor, materials and equipment to complete the project. The Subcontractor shall perform the work in accordance with this specification document. The Subcontractor shall perform the following tasks:

- a. Make field measurements and determine field routing prior to purchasing materials and starting work.
- b. Produce a design package for removal and replacement of the clarifier, weir and sump pump control box prior to start of work. The purpose of the design package is for the Subcontractor to provide descriptions/drawings for removal of old equipment and installation of new equipment, describe how the work will be done to minimize plant down-time, ensure the quality of processed water is not impacted, provide manufacturer's data/specifications for proposed materials and equipment, and meet construction schedules. The design package shall contain:
 - 1) Drawings in AutoCAD format (2006 or later) showing the removal of the existing clarifier, weir and sump pump control box, and installation of the new clarifier, weir and sump pump control box
 - 2) A narrative description of work to be performed and methods to be used for removal and installation of the above equipment
 - 3) A complete list of proposed equipment and materials to be installed, including manufacturer's cutsheets, brochures, and product specification sheets
 - 4) Manufacturer's MSDS, as applicable, for products the Subcontractor intends to use on this project
 - 5) A a construction schedule as defined in section 01 32 16.00 20
 - 6) The Subcontractor shall not procure materials or begin work until the Contracting Organization has reviewed and approved the design package.
- c. Perform demolition of the existing sludge collector, weir, and sump pump motor control, as defined in these specifications.
- d. Replace the existing sump motor control box, equipment number 1660ELVDSC003, including conduit and wiring, from the power input junction box to the pump junction box.
- e. Install the new weir provided by the Contracting Organization.
- f. Provide and install a new rectangular clarifier in the sludge collection system tank. The weir will be supplied by the Contracting Organization.
- g. Supply the the materials, fittings and hardware required to install the above equipment.
- h. Coordinate with designated Construction Management personnel to coordinate outages as needed during the project.
- i. Perform all work such that facility operations are not interrupted. See the "Work Restrictions" section of this

Specification.

- j. Provide daily on-site construction management and support for the project. This includes a Microsoft Project schedule, updated weekly.
- k. Provide skilled labor necessary and sufficient to complete the project.
- l. Ensure all work done in accordance with applicable codes, regulations, standards and the Specifications for this project.
- m. Provide an electronic copy in AutoCAD® format, and one hard (paper) copy, of the as-built drawings.
- n. Provide an electronic copy in Microsoft Word or Excel format the Bill of Materials purchased and installed for this project.
- o. Provide a hard (paper) copy and an electronic copy in PDF or Microsoft Word format the vendor/manufacturer installation instructions, maintenance manuals, and product description sheets/brochures (as applicable) for all materials and/or equipment installed for this project.
- p. Provide submittals as defined in this specification document.

1.1.1.4 Verification of Conditions

Dimensions and elevations indicated in the layout of work shall be verified by the Subcontractor. Discrepancies between the specifications and existing conditions shall be referred to the Project Engineer in writing, for review, before the affected work is performed. Failure to make notification shall place the responsibility upon the Subcontractor to carry out the work in a satisfactory and workmanlike manner.

1.1.2 Location

The work will be performed at the AUTECH Site 1, Facility Number 1660, the Waste Water Treatment Plant; details are provided in the specifications supplied with this project. The Atlantic Undersea Test and Evaluation Center (AUTECH) is a Naval testing range under the command of the Naval Undersea Warfare Center (NUWC). The test range is located on Andros Island, Bahamas, approximately 180 miles southeast of West Palm Beach, FL. Aircraft contracted to AUTECH provide transport for personnel and air-transportable freight between West Palm Beach, FL and Andros Island. All other freight and heavy cargo is shipped to Site 1 via a Military Sealift Command (MSC) barge out of Port Canaveral, FL. Shipping instructions are contained in the provided General Provisions document.

1.2 EXISTING WORK

1.2.1 Existing Hazardous Materials

See Section 01 35 29, paragraph titled "Existing Hazardous Materials," for a description of any existing hazardous materials (asbestos, hazardous metals in paints and coatings, etc.) at the job site.

1.3 GOVERNMENT FURNISHED MATERIAL

The following material/equipment will be furnished to the Subcontractor for installation by the Subcontractor: aluminum weir.

All other tools, equipment and materials are to be furnished by the Subcontractor.

1.3.1 Delivery Schedule

Notify the Project Engineer in writing at least 15 calendar days in advance of the date on which the furnished materials and/or equipment are required.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

SPECIFICATION COVER SHEET

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS

07/06

PART 1 GENERAL

1.1 SUBMITTALS

Contracting Organization approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Subcontractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of contact personnel; G

List of Transmitting Devices

1.2 WORK AND SCHEDULING REQUIREMENTS

- a. The Subcontractor shall have all materials, equipment, and personnel required to perform the work at the site prior to the commencement of the work.
- b. The Waste Water Treatment Plant will remain in operation during the entire construction period. The Subcontractor shall conduct his operations so as to cause the least possible interference with normal operations of the facility.
- d. Permission to interrupt any roads and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.
- e. The work under this contract requires special attention to the scheduling and conduct of the work in connection with normal operations at the facility. Identify on the construction schedule each factor that constitutes a potential interruption to activities or operations at the facility.

The following conditions apply:

- (1) The Subcontractor shall perform work during hours specified in the "Working Hours" paragraph below.

1.3 Subcontractor ACCESS AND USE OF PREMISES

1.3.1 Activity Regulations

Ensure that Subcontractor personnel become familiar with and obey AUTC regulations. Keep within the limits of the work and avenues of ingress and egress. Wear hard hats in designated areas. Do not enter restricted areas unless required and clearance has been granted and escort provided. The Subcontractor's equipment shall be marked conspicuously for identification.

1.3.1.1 Subcontractors and Personnel Contacts

Furnish a List of contact personnel of the Subcontractor and firms hired by

the Subcontractor, including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

1.3.1.2 Identification Badges

AUTEC is a secure base. Access to the base is limited to badged personnel. Subcontractor Personnel performing work at AUTEC are designated as Category I Guests. The designated sponsor for all subcontractor personnel is the Subcontract Administrator/Buyer.

Requests for Badges will be submitted using DC Form 946 "Category I and II Visitor Badge Request". Blank copies of this form will be supplied to the Subcontractor by the Subcontract Administrator/Buyer. Subcontractor shall return completed forms to the Subcontract Administrator/Buyer no later than three (3) working days prior to the actual visit.

Badges must be clearly displayed above the waist on the front torso, either clipped to the outer garment or suspended from a chain or necklace, unless such display clearly presents a safety hazard in the work environment. Badges must be carried on the person at all times at the worksite.

Access to secure facilities on the base is restricted to personnel with security clearances. Subcontractor personnel are allowed access to secure facilities only when cleared and escorted by properly badged AUTEC personnel. Identification badges will be furnished without charge. Application for and use of badges will be as directed.

Immediately report instances of lost or stolen badges to the Subcontract Administrator/ Buyer.

1.3.1.3 Personnel Entry Approval

Failure to obtain entry approval will not affect the contract price or time of completion.

1.3.2 Working Hours

Working hours shall be agreed upon with the Project Engineer prior to purchase of material and commencement of demolition work. Working hours shall be established to limit the impact on plant operation and/or wastewater processing capacity.

1.3.3 Work Outside Regular Hours

Work outside the specified working hours requires Project Engineer approval. Make requests 15 working days prior to such work to allow arrangements to be made by the Contracting Organization. During periods of darkness the work shall be lighted in a manner approved by the Project Engineer.

1.3.4 Operational Building

The facility is an operational building. Work shall be scheduled with the Project Engineer and Facility Manager to minimize down time.

Leave attached equipment in place, and protect it against damage, or when approved by the Project Engineer temporarily disconnect, relocate, protect, and reinstall it at the completion of the work.

1.3.5 Utility Cutovers and Interruptions

The Contracting Organization will provide support as required for utility cutovers and interruptions. Utility cutovers and interruptions shall be made in accordance with the following:

- a. Coordinate utility cutovers with the Project Engineer. Make utility cutovers and interruptions in accordance with established schedules.
- b. Interruption to potable water, sanitary sewer, wastewater, and effluent shall be limited to a single 8-hour period.
- c. Ensure that new and/or temporary utility lines are complete, except for the connection, before interrupting existing utility.
- d. Interruption to potable water, sanitary sewer, wastewater and effluent, storm sewer, telephone service, and electric service, shall be considered utility cutovers.

1.3.6 List of Transmitting Devices

The Subcontractor shall submit to the Contracting Organization a listing of all equipment or devices for use at AUTECH that transmit signals at any frequency. The list shall describe the device and the frequency, or range of frequencies, transmitted. Transmitting devices that are not allowed, or require further information before approval, will be supplied to the Subcontractor. This process must be completed before the transmitting devices are brought onto the AUTECH base.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 32 16.00 20

CONSTRUCTION PROGRESS DOCUMENTATION

04/06

PART 1 GENERAL

1.1 SUBMITTALS

Contracting Organization approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Subcontractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

- Certificates of insurance
- Surety bonds
- List of proposed subcontractors
- List of proposed products
- Manufacturer's Cutsheets/Product Data for proposed products
- Material Safety Data Sheets
- Construction Progress Schedule
- Submittal register
- Schedule of prices
- Health and safety plan
- Work plan
- Quality control (QC) plan
- Environmental protection plan

Construction schedule; G

1.2 CONSTRUCTION SCHEDULE

Prior to the start of work, prepare and submit to the Project Engineer for acceptance of the construction schedule. The construction schedule shall be in Microsoft Project format, using the Critical Path Method (CPM). This schedule shall reflect the order in which the Subcontractor proposes to perform the work, and the dates on which the Subcontractor plans to start and complete the major phases or portions of the work (including acquiring materials and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. The Subcontractor shall provide weekly electronic updates to this MS Project schedule to the Project Engineer.

1.3 EQUIPMENT DELIVERY SCHEDULE

1.3.1 Initial Schedule

Within 15 calendar days after acceptance of the proposed construction schedule, submit for Subcontract Administrator/ Buyer acceptance a Procurement Schedule showing procurement plans for materials and equipment for the project. Submit in Microsoft Project format unless otherwise directed by the Subcontract Administrator/ Buyer; include as a minimum the following information:

- a. Description of materials ordered.

- b. Date of the purchase order.
- c. Promised shipping date.
- d. Name of the manufacturer or supplier.
- e. Date delivery is expected.
- f. Date the material or equipment is required, according to the current construction schedule.

Note that the subcontractor must receive written approval of material submittals from the Project Engineer prior to ordering.

1.4 UPDATED SCHEDULES

Update the construction schedule and equipment delivery schedule at weekly intervals and when the schedule has been revised. Reflect any changes occurring since the last update. Submit copies of the purchase orders and confirmation of the delivery dates as directed.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

10/06

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections.
Submittals are identified by SD numbers and titles as follows.

SD-01 Preconstruction Submittals

Certificates of insurance.
Surety bonds.
List of proposed subcontractors.
List of proposed products.
Construction Progress Schedule.
Submittal register.
Schedule of prices.
Health and safety plan.
Work plan.
Quality control plan.
Environmental protection plan.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Subcontractor for integrating the product or system into the project.

Drawings prepared by or for the Subcontractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Subcontractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Subcontractor, or of a manufacturer, supplier, installer or subcontractor through Subcontractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This Data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

1.1.2 Approving Authority

Office or designated person authorized to approve submittal.

1.1.3 Work

As used in this section, on-site and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

Contracting Organization approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Contracting Organization. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal register; G

1.3 USE OF SUBMITTAL REGISTER

Submittal register will be delivered to the Subcontractor by the Subcontract Administrator/ Buyer. The register will have the following fields listed below. First four columns will be completed by the Contracting Organization prior to issue to the Subcontractor.

Section Number: Lists specification section in which submittal is required.

Subpart Number: Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

SD Number: Lists each submittal number, e.g. SD-04 Drawings.

Submittal Item: Lists each submittal description required in each specification section.

Date Submitted: Date Subcontractor provides submittal to Project Engineer.

Approving Authority: Printed name of Contracting Organization person responsible for reviewing the submittal.

Acc/Rej: Reviewers acceptance or rejection of the submitted item.

Date Accepted: Date the Reviewer accepts the submitted item.

The Subcontractor shall provide submittals as the work progresses.

1.3.1 Submittal Register

The Subcontractor shall submit a copy of the submittal register with each submittal package; submittal documentation shall also be submitted electronically in formats compatible with Microsoft Office programs or PDF for written or typed documents, AutoCAD for drawings, and JPG for photographs. Submittals containing physical samples shall be provided to

the Subcontract Administrator. Submit with quality control plan and project schedule and Section 01 32 16.00 20 CONSTRUCTION PROGRESS DOCUMENTATION. Verify that all submittals required for project are listed and add missing submittals.

1.3.2 Subcontractor Use of Submittal Register

The Subcontractor shall update the "Date Submitted" column with the date each submittal is provided to the Project Engineer for each submittal.

1.3.3 Approving Authority Use of Submittal Register

The Approving Authority shall update the following fields.

Approving Authority: Print or type name into this field.

Acc/Rej: Write or type the word "Accepted" for each accepted submittal. Write or type the word "Rejected" for each rejected submittal. For each rejected submittal the Reviewing Authority shall utilize the Rejected Submittal portion of the Submittal Register.

Date Accepted: Write or type the date the submittal is accepted.

1.3.4 Copies Delivered to the Contracting Organization

Deliver one copy of submittal register updated by Subcontractor to Contracting Organization with each invoice request.

1.4 PROCEDURES FOR SUBMITTALS

1.4.1 Reviewing, Certifying, Approving Authority

The Subcontractor shall be responsible for reviewing and certifying submittals are in compliance with contract requirements. Approving authority on submittals is the Engineer unless otherwise specified for specific submittal. At each "Submittal" paragraph in individual specification sections, a notation "G," following a submittal item, indicates Subcontract Administrator is approving authority for that submittal item.

1.4.2 Constraints

- a. Submittals listed or specified in this contract shall conform to provisions of this section, unless explicitly stated otherwise.
- b. Submittals shall be complete for each definable feature of work; components of definable feature interrelated as a system shall be submitted at same time.
- c. When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.
- d. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.4.3 Scheduling

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential requirements to resubmit.
- b. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 15 working days for submittals for the Project Engineer approval. Period of review for submittals begins when the Contracting Organization receives the submittal. Period of review for each resubmittal is the same as for initial submittal.
- c. For submittals requiring review by fire protection engineer, allow review period, beginning when Contracting Organization receives submittal from Engineering organization, of 30 working days for return of submittal to the Subcontractor. Period of review for each resubmittal is the same as for initial submittal.

1.4.4 Variations

Variations from contract requirements require Contracting Organization approval and will be considered where advantageous to Contracting Organization.

1.4.4.1 Considering Variations

Discussion with Subcontract Administrator prior to submission, will help ensure functional and quality requirements are met and minimize rejections and resubmittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

1.4.4.2 Proposing Variations

When proposing variation, deliver written request to the Subcontract Administrator, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Contracting Organization. If lower cost is a benefit, also include an estimate of the cost saving. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.4.4.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Subcontractor warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.4.4.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Contracting Organization of submittals with variations.

1.4.5 Actions Possible

Submittals will be returned with one of the following notations:

- a. Submittals marked "accepted" authorize the Subcontractor to proceed with work covered.
- d. Submittals marked "rejected" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and shall be resubmitted with appropriate changes. The Approving Authority shall provide a reason for rejection sufficient for the Subcontractor to determine a course of action to correct the rejected submittal. No work shall proceed for this item until resubmittal is approved.

1.5 FORMAT OF SUBMITTALS

1.5.1 Transmittal Form

Subcontract Administrator will supply copies of transmittal forms to the Subcontractor. The Subcontractor shall transmit each submittal to the Project Engineer, or to the Subcontract Administrator/ Buyer if the Project Engineer is not available. The transmittal form shall identify Subcontractor, indicate date of submittal, and include information in the paragraph entitled "Identifying Submittals."

1.5.2 Identifying Submittals

Identify submittals, except sample panel and sample installation, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

- a. Project title and facility or location.
- b. Construction contract number.
- c. Section number of the specification section by which submittal is required.
- d. Submittal description (SD) number of each component of submittal.
- e. When a resubmission, add alphabetic suffix on submittal description, for example, SD-10A, to indicate resubmission.
- f. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other second tier Subcontractor associated with submittal.
- g. Product identification and location in project.

1.5.3 Format for SD-02 Shop Drawings

- a. Shop drawings shall not be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, and shall be provided in both hard copy and electronic format. The preferred electronic format is AutoCAD but formats compatible with Microsoft Office may be accepted if prior approval is obtained.
- b. Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.

- c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled "Identifying Submittals."
- d. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Shop drawing dimensions shall be the same unit of measure as indicated on the contract drawings. Identify materials and products for work shown.
- e. Drawings shall include the nameplate data, size and capacity. Also include applicable federal, military, industry and technical society publication references.

1.5.4 Format of SD-03 Product Data and SD-08 Manufacturer's Instruction

- a. Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.
- b. Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.
- c. Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.
- e. Product data shall include the manufacturer's name, trade name, place of manufacture, and catalog model or number. Submittals shall also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for SD-07 Certificates.
- f. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Subcontract Administrator. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
- g. Submit manufacturer's instruction prior to installation.

1.5.5 Format of SD-04 Samples

- a. Furnish samples in sizes below, unless otherwise specified or

unless the manufacturer has prepackaged samples of approximately same size as specified:

- (1) Sample of Equipment or Device: Full size.
 - (2) Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.
 - (3) Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.
 - (4) Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.
 - (5) Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.
 - (6) Color Selection Samples: 2 by 4 inches.
 - (7) Sample Panel: 4 by 4 feet.
 - (8) Sample Installation: 100 square feet.
- b. Samples Showing Range of Variation: Where variations are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range.
 - c. Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples shall be in undamaged condition at time of use.
 - d. Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean up of project.
 - e. When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.5.6 Format of SD-05 Design Data and SD-07 Certificates

- a. Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.

1.5.7 Format of SD-06 Test Reports and SD-09 Manufacturer's Field Reports

- a. Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.
- b. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

1.5.8 Format of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

- a. When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Subcontractor's approval stamp to document, but to a separate sheet accompanying document.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Copies of SD-02 Shop Drawings

- a. Submit one paper copy and one electronic copy of shop drawings.

1.6.2 Number of Copies of SD-03 Product Data and SD-08 Manufacturer's Instructions

Submit in compliance with quantity requirements specified for shop drawings.

1.6.3 Number of Samples SD-04 Samples

- a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Subcontractor.
- b. Submit one sample panel. Include components listed in technical section or as directed.
- c. Submit one sample installation, where directed.
- d. Submit one sample of non-solid materials.

1.6.4 Number of Copies SD-05 Design Data and SD-07 Certificates

- a. Submit in compliance with quantity requirements specified for shop drawings.

1.6.5 Number of Copies SD-06 Test Reports and SD-09 Manufacturer's Field Reports

- b. Submit in compliance with quantity with quality requirements specified for shop drawings.

1.6.6 Number of Copies of SD-10 Operation and Maintenance Data

Submit three paper copies and one electronic copy of O&M Data.

1.6.7 Number of Copies of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

- a. Unless otherwise specified, submit administrative submittals compliance with quantity requirements specified for shop drawings.

1.7 FORWARDING SUBMITTALS

1.7.1 Submittals Required from the Subcontractor

As soon as practicable after award of contract, and before procurement of

fabrication, forward to the Subcontract Administrator submittals required in the technical sections of this specification, including shop drawings, product data and samples, for review by the Project Engineer. One copy of the transmittal form for all submittals shall be forwarded to the Subcontract Administrator.

1.7.1.1 O&M Data

The Architect-Engineer for this project will review and approve for the Subcontract Administrator O&M Data to verify the submittals comply with the contract requirements; submit data specified for a given item within 30 calendar days after the item is delivered to the contract site.

- a. In the event the Subcontractor fails to deliver O&M Data within the time limits specified, the Subcontract Administrator may withhold from progress payments 50 percent of the price of the item with which such O&M Data are applicable.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 35 29

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASSE A10.34 (2001) Protection of the Public on or
Adjacent to Construction Sites

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2008) National Electrical Code

NFPA 70E (2004) Electrical Safety in the Workplace

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1926 Safety and Health Regulations for
Construction

1.2 SUBMITTALS

Items with a "G" designation are to be submitted with the bid package. Items without the "G" shall be available upon request. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Safety Plan (CSP); G

Contractor Job Hazard Analysis (CJHA); G

SD-06 Test Reports

Accident Reports / Near Miss Reports

Submit reports when the incident occurs, in accordance with the requirements of the paragraph entitled, "Reports."

SD-07 Certificates

Hot work permit

Confined Space Entry Permit

Fall Protection Climb Permit

Contractor Safety Self-Evaluation Checklist; G

Submit one copy of each permit/certificate attached to each Daily Report.

1.3 DEFINITIONS

a. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

b. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

c. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered personnel.

f. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work (any time lost after day of injury/illness onset);

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

(8) Damage to equipment.

h. Weight Handling Equipment (WHE) Accident occurs when the following happens while using Navy owned or leased WHE and any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and/or collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with 29 CFR 1910 and the following host nation laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the the Subcontract Administrator/ Buyer for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 Safety and Health Officer (SHO)

The Subcontractor shall appoint an on-site Supervisor or Superintendent to act as Safety and Health Officer (SHO). The SHO shall be on site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Subcontractor. The SHO shall have Competent Person training as needed.

1.5.2 Personnel Duties

1.5.2.1 Safety and Health Officer (SHO)/Superintendent

- a. Conduct daily safety and health inspections and maintain a written log that includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily report.
- b. Conduct mishap investigations and complete required AUTC Document Control (DC) reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
- c. Maintain applicable safety reference material on the job site.
- d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
- e. Implement and enforce accepted CSP and CJHAs.
- f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.
- g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.5.3 Meetings

1.5.3.1 Preconstruction Conference

a. A Preconstruction Conference will be held prior to start of work to review the CSP and CJHAs.

b. Deficiencies in the submitted CSP will be brought to the attention of the Subcontractor at the preconstruction conference, and the Subcontractor shall revise the plan to correct deficiencies and re-submit..

c. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.5.3.2 Safety Meetings

Shall be conducted and documented as required by 29 CFR 1926 and 29 CFR 1910. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily report.

1.6 CONTRACTOR SAFETY PLAN (CSP)

The Subcontractor shall use a qualified person to prepare the written site-specific CSP. Prepare the CSP in accordance with the format and requirements of 29 CFR 1910 and 29 CFR 1926, and as supplemented herein. The CSP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The CSP shall interface with the Subcontractor's overall safety and health program. Any portions of the Subcontractor's overall safety and health program referenced in the CSP shall be included in the applicable CSP element and made site-specific. The Contracting Organization considers the Subcontractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The CSP shall be signed by the person and firm (senior person) preparing the CSP, the Subcontractor, the on-site superintendent, the designated Safety and Health Officer and, when required, a designated CSP and/or CIH.

The CSP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted CSP will be cause for stopping of work, at the discretion of the Subcontract Administrator/ Buyer, until the matter has been rectified.

Once work begins, changes to the accepted CSP shall be made with the knowledge and concurrence of the Subcontract Administrator/ Buyer, Contracting Project Engineer, and SHO. Should any hazard become evident, stop work in the area, secure the area, and develop a plan to remove the hazard. Notify the Subcontract Administrator/ Buyer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, all necessary action shall be taken to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ANSI/ASSE A10.34,) and the environment.

A copy of the accepted plan will be maintained at the job site.

The CSP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original CSP shall be incorporated in the plan as they are discovered.

1.6.1 Contractor Safety Plan (CSP) Contents

The following is required content of the Contractor Safety Plan:

- a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used such as CSPs, CIHs, STSS, CHSTs. The duties of each position shall be specified.
- b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; scaffolding; fall protection; Lockout / Tagout; confined spaces; health hazard recognition, evaluation and control of chemical, physical and biological agents; specialty vehicle licenses; personal protective equipment and clothing to include selection, use and maintenance.
- c. The following topics shall be addressed when relevant to the Scope of Work:
 - Program Management
 - Sanitation
 - Medical and First Aid Requirements
 - Temporary Facilities
 - Personal Protective and Safety Equipment
 - Hazardous Substances, Agents, and Environments
 - Lighting
 - Accident Prevention Signs, Tags, Signals, Piping System
 - Identification and Traffic Control
 - Fire Prevention and Protection
 - Welding and Cutting
 - Electrical Safety
 - Control of Hazardous Energy (Lockout/Tagout)
 - Hand and Power Tools
 - Material Handling, Storage, and Disposal
 - Rigging
 - Machinery and Mechanized Equipment
 - Conveyors
 - Motor Vehicles
 - Floating Plant and Marine Activities
 - Pressurized Equipment and Systems
 - Safe Access and Fall Protection
 - Work Platforms
 - Demolition
 - Floor and Wall Holes and Openings
 - Excavations
 - Concrete and Masonry Construction and Steel Erection
 - Contract Diving Operations
 - Emergency Action Plan
 - Hazard Communication (HAZCOM)
 - Training Plan

- d. The CSP will be consistent with the applicable AUTECH Project Plans (APPs).

1.7 CONTRACTOR JOB HAZARD ANALYSIS (CJHA)

The Contractor Hazard Analysis (CJHA) shall address all hazards expected during performance of the contracted work, including existing hazardous conditions and materials at the work site, hazardous materials the Subcontractor will supply and use during performance of the work, and hazardous operations performed during the work. The CJHA should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The CJHA list will be reviewed periodically (at least monthly) at the Subcontractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

The activity hazard analyses shall be developed using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an CJHA. The CJHAs will be developed by the Subcontractor, supplier or subcontractor and provided to the prime Subcontractor for submittal to the Subcontract Administrator/ Buyer.

1.8 DISPLAY OF SAFETY INFORMATION

Within 1 calendar day after commencement of work, erect a safety bulletin board at the job site. Items required to be posted include (post all that apply):

- a. Contractor Safety Plan (CSP)
- b. Hot work permit.
- c. Contractor Safety Self-Evaluation Checklist
- d. Confined Space Entry Permit
- e. Fall Protection Climb Permit

1.9 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.10 EMERGENCY MEDICAL TREATMENT

In the event of an emergency call 911. Emergency medical treatment will be provided at the AUTECH Dispensary only to the extent required to stabilize the injured person for transport off Andros Island. The Subcontractor shall arrange for transport of injured personnel that cannot be transported via standard AUTECH flights and flight schedules. The Subcontractor shall bear all costs incurred for medical treatment, and for all transportation costs outside normally scheduled AUTECH flights.

1.11 REPORTS

1.11.1 Accident Reports / Near Miss Reports

a. For recordable injuries and illnesses and government property damage accidents the Prime Subcontractor and SHO shall conduct an accident investigation to establish the root cause(s) of the accident, complete the following applicable documents: Form DC 850 (Incident report form), Form DC 1047 (Incident investigation report), Form DC 1048 (Injured Employee/Witness Statement), and Form DC 982 (Hazardous Material Spill/Incident Report) and provide signed copies of the reports to CSC ES&H and the Project Engineer within 24 hours of the accident. The Project Engineer will provide copies of any required or special forms.

b. In addition to requirements listed in the paragraph above, for any Navy owned or leased weight handling equipment accident (including rigging gear accidents) the Prime Subcontractor and SHO shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to CSC ES&H and the Subcontract Administrator/ Buyer within 20 calendar days of the accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting organization, and the Subcontract Administrator/ Buyer. The Subcontract Administrator/ Buyer will provide a blank copy of the accident report form.

1.11.2 Accident Notification

In the event of an emergency call 911. Notify the Subcontract Administrator/ Buyer as soon as practical, but not later than two hours, after any accident meeting the definition of Recordable Injuries or Illnesses, Near Misses, or High Visibility Accidents, damage to any Government property, or any weight handling equipment accident. Information shall include Subcontractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.12 HOT WORK

Prior to performing "Hot Work" (welding, flame cutting, grinding, hot riveting, or other fire or spark-producing operation) a written permit shall be requested from AUTC Fire Department. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Contractors will follow APP 11-3G regarding AUTC Fire Protection Policy.

When starting work in the facility, Contractors shall require their personnel to familiarize themselves with the location of the nearest fire alarm boxes, fire extinguisher, and place in memory the emergency Fire Division phone number, which is 911. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE AUTC FIRE DEPARTMENT IMMEDIATELY.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

The Subcontractor shall comply with applicable sections of 29 CFR 1910 and 29 CFR 1926, the CSP, the CJHA, and other related submittals and activity fire and safety regulations. The most stringent standard shall prevail.

3.1.1 Hazardous Material Use

Hazardous materials supplied and used by the Subcontractor shall be handled and utilized in accordance with Section 01 57 19.00 20.

3.1.2 Prohibited Hazardous Materials

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation, as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and paints or coatings that contain cadmium or chromium are prohibited. The Subcontract Administrator/ Buyer, upon written request by the Subcontractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Existing Hazardous Materials

The job site has been surveyed by CSC and no asbestos containing materials or lead-based paints have been identified.

3.1.3.1 Protection of Personnel

Subcontractor is responsible for ensuring that Subcontractor personnel are protected from known hazardous materials at the job site in accordance with applicable OSHA standards. This includes all personnel employed directly by the Subcontractor, and all personnel employed by any subcontractor hired by the Subcontractor. Protection of personnel may include, but is not limited to, providing or arranging for personal protection equipment (PPE), wash-down and/or clothing change-out facilities, and health monitoring for personnel. Protection shall be as directed in writing by a Certified Industrial Hygienist (CIH) with relevant experience employed by or hired by the Subcontractor.

3.1.4 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Subcontract Administrator/ Buyer immediately. The Contracting Organization will determine if the material is hazardous. If material is not hazardous or poses no danger, the Contracting Organization will direct the Subcontractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Contracting Organization will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Subcontractors are required to request and coordinate utility outages at least 15 days in advance through the Project Engineer. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Once approved, and prior to beginning work on the utility system requiring shut down, the Subcontractor shall attend a pre-outage coordination meeting with the Project Engineer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work shall be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 TRAINING

Contractor will maintain at job site applicable training records for employees.

3.4 EQUIPMENT

3.4.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA and U.S. Navy instructions.

3.4.2 Equipment and Mechanized Equipment

a. Proof of qualifications for operator shall be kept on the project site for review.

b. Manufacturer's specifications or owner's manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA. Such additional safety precautions or requirements shall be incorporated into the CJHAs.

3.5 UTILITIES WITHIN CONCRETE SLABS

Utilities located within or under concrete slabs are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever contract work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with AUTC utility departments in addition to Subcontractor locating service. Outages to isolate utility systems shall be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Subcontractor from meeting this requirement.

3.6 ELECTRICAL

3.6.1 Conduct of Electrical Work

Electrical cables that will be cut or disconnected shall be positively identified and de-energized prior to performing the work. Positive cable identification shall be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Project Engineer and Station Utilities for identification. The Project Engineer will not accept an outage request until the Subcontractor satisfactorily documents that the circuits have been clearly identified.

Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When work requires Subcontractor to work near energized circuits as defined by the NFPA 70, personnel performing the work must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Subcontractor's CJHA.

3.6.2 Portable Extension Cords

Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered and protected from damage. All damaged extension cords shall be immediately removed from service. Portable extension cords shall meet the requirements of NFPA 70.

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

07/06

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

AMERICAN BEARING MANUFACTURERS ASSOCIATION (ABMA)
2025 M Street, NW, Suite 800
Washington, DC 20036
Ph: 202-367-1155
Fax: 202-367-2155
E-mail: info.abma@smithbucklin.com
Internet: <http://www.abma-dc.org>

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1819 L Street, NW, 6th Floor
Washington, DC 20036
Ph: 202-293-8020
Fax: 202-293-9287
E-mail: info@ansi.org
Internet: <http://www.ansi.org/>

--- ANSI documents beginning with the letter "S" can be ordered from:

Acoustical Society of America (ASA)
2 Huntington Quadrangle, Suite 1N01
Melville, NY 11747-4502
Ph: 516-576-2360
Fax: 516-576-2377
E-mail: asa@aip.org
Internet: <http://asa.aip.org>

ASME INTERNATIONAL (ASME)
Three Park Avenue, M/S 10E

New York, NY 10016
Ph: 212-591-7722 or 800-843-2763
Fax: 212-591-7674
E-mail: infocentral@asme.org
Internet: <http://www.asme.org>

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: <http://www.astm.org>

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 Hoes Lane
Piscataway, NJ 08855-1331
Ph: 732-981-0060
Fax: 732-981-1712
E-mail: customer-services@ieee.org
Internet: <http://www.ieee.org>

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209
Ph: 703-841-3200
Fax: 703-841-5900
E-mail: webmaster@nema.org
Internet: <http://www.nema.org/>

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: <http://www.nfpa.org>

UNDERWRITERS LABORATORIES (UL)
333 Pfingsten Road
Northbrook, IL 60062-2096
Ph: 847-272-8800
Fax: 847-272-8129
E-mail: customerexperiencecenter@us.ul.com
Internet: <http://www.ul.com/>

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
Internet: <http://www.archives.gov>

Order documents from:
Superintendent of Documents
U.S. Government Printing Office (GPO)
732 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800

Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: <http://www.gpoaccess.gov>

-- End of Section --

SECTION 01 50 00.00 20

TEMPORARY FACILITIES AND CONTROLS

04/06

PART 1 GENERAL

1.1 TEMPORARY UTILITIES

Reasonable amounts of the following utilities will be made available to the Contractor without charge.

- Electricity
- Potable Water

The Contractor shall pay all costs incurred in connecting, converting, and transferring the utilities to the work. The Contractor shall make connections and make disconnections.

1.2 STORAGE AREAS

The Subcontractor shall be responsible for security of his property and project materials.

1.2.1 Storage Size and Location

The open site available for storage shall be confined to the project work area.

1.2.2 Storage in Existing Buildings

The Subcontractor will be working in existing building; the storage of material shall not be allowed in the building.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TEMPORARY PHYSICAL CONTROLS

3.1.1 Access Controls

3.1.1.1 Temporary Barricades

Subcontractor shall provide for barricading around all work areas to prevent public access.

3.1.1.2 Signs

The Subcontractor shall place warning signs at the construction area perimeter designating the presence of construction hazards requiring unauthorized persons to keep out. Signs must be placed on all sides of the project, with at least one sign every 100 feet, or at least two signs, whichever is greater. All points of entry shall have signs designating the construction site as a hard hat area.

-- End of Section --

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS

07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 273	Standards For Universal Waste Management
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 173	Shippers - General Requirements for Shipments and Packaging

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that has eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations.

Types of solid waste typically generated at construction sites may include:

- a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.
- b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.
- c. Construction Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection. Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.
- d. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.
- e. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.
- f. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may not be included as recyclable if sold to a scrap metal company.
- g. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or

wastes associated with natural gas or crude oil exploration or production.

1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

1.2.5 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 266, 40 CFR 268, 40 CFR 270, and 40 CFR 273.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171.

Hazardous material is any material that:

- a. Is regulated as a hazardous material per 49 CFR 173, or
- b. Requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.120, or
- c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material includes ammunition, weapons, explosively actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

1.2.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or

physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.2.9 Oily Waste

Those materials which are, or were, mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewater, centrifuge solids, filter residues or sludge, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, used oil.

1.2.10 Regulated Waste

Those solid waste that have specific additional Federal, state, or local controls for handling, storage, or disposal.

1.3 SUBMITTALS

Items with a "G" designation are to be submitted with the bid package. Items without the "G" shall be available upon request. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Solid Waste Management Plan; G

Environmental Review Compliance Plan; G

Material Safety Data Sheets

Subcontractor Hazardous Material Inventory Log; G
Submit the "Subcontractor Hazardous Material Inventory Log" which provides information required by the Emergency Planning and Community Right-to-know Act (EPCRA), Sections 312 and 313, along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Andros Island Final Governing Standards, State of Florida regulations, US EPA regulations, applicable AUTC Project Procedures (APPs) pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

1.5 MEETINGS

1.5.1 Preconstruction Conference

a. The Subcontractor shall attend the Preconstruction Conference. A Preconstruction Conference will be held prior to start of work to review the submittals and additional environmental protection

requirements.

b. Deficiencies in the submittals will be brought to the attention of the Subcontractor at the preconstruction conference, and the Subcontractor shall revise the plan to correct deficiencies and re-submit.

c. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 ENVIRONMENTAL REVIEW COMPLIANCE PLAN

The Subcontractor shall generate and submit an Environmental Compliance Plan that will, at a minimum, address the following elements, as applicable to the work being performed:

- a. Description of the Environmental Protection Plan
 - (1) General overview and purpose
 - (2) General site information
- b. Protection of Natural Resources
 - (1) Land resources
 - (2) Tree protection
 - (3) Replacement of damaged landscape features
 - (4) Temporary construction
- c. Storm Water Management and Control
 - (1) Ground cover
 - (2) Erodible soils
 - (3) Temporary measures
 - (a) Mechanical retardation and control of runoff
 - (b) Vegetation and mulch
- d. Solid Waste Management Plan
 - (1) Control and disposal of solid and sanitary waste. Pick up solid wastes, and place in provided containers. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Dumpsters and/or waste containers will be provided to the Subcontractor by CSC. Locate dumpsters out of the path of foot and vehicle traffic. Notify

Contracting Construction Manager for empty dumpster when needed.

(2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

Unless specified otherwise, excess hazardous material and Subcontractor generated hazardous waste removal from the island is the responsibility of the Subcontractor.

Management of the hazardous waste will be in accordance with the Hazardous Waste Management Plan. This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Subcontractor upon request. As a minimum, include the following:

f. Prevention of Releases to the Environment

(1) Procedures to prevent releases to the environment

(2) Notifications in the event of a release to the environment

g. Regulatory Notification and Permits

(1) List what notifications and permit applications must be made. Include copies of all applicable, environmental permits.

h. Material Safety Data Sheets

(1) Provide Material Safety Data Sheets as applicable for all materials proposed for this project.

3.2 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities within the limits of the work indicated or specified.

Do not remove, cut, deface, injure, or destroy trees or shrubs without CSC Environmental Safety & Health permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages.

3.2.1 Erosion and Sediment Control Measures

3.2.1.1 Burnoff

Burnoff of the ground cover is not permitted.

3.2.1.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.2.1.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

a. Mechanical Retardation and Control of Runoff

(1) Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, berms, and use of silt fences and straw bales to retard and divert runoff to protected drainage courses.

c. Vegetation and Mulch

(1) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to reestablish a suitable stand of grass.

3.3 Subcontractor Hazardous Material Inventory Log

Prior to bringing any additional hazardous materials to the project not listed in the initial Hazardous material inventory log, information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) shall be submitted to the Subcontract Administrator/ Buyer. At the completion of the project, A copy of the log will be submitted to the Subcontract Administrator/ Buyer showing the total quantity brought to the project, quantities used, remaining product, and the disposition of waste material generated.

3.4 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of hazardous waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the Environmental Protection Plan. Consult with CSC Environmental Safety & Health for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material when preparing this part of the plan. If no written plan exists, obtain information by contacting the Subcontract Administrator/ Buyer. Describe the types of the hazardous materials expected to be used in the construction when requesting information.

3.5 WHM/HW MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on government property. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. CSC is not responsible for disposal of Subcontractor's waste material brought on the job site and not required in the performance of this contract. The Subcontractor is not authorized to discharge any materials onto the ground, to sanitary sewer, storm drain, natural bodies of water, or conduct waste treatment or disposal on government property without written approval of CSC Environmental Safety and Health.

3.6 HAZARDOUS MATERIAL CONTROL

Submit a MSDS and estimated quantities to be used for each hazardous material to CSC Environmental Safety and Health prior to bringing the material on base. Typical materials requiring MSDS and quantity reporting

include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. At the end of the project, provide the Contracting Officer with the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Keep copies of the MSDS for hazardous materials on site at all times and provide them to the Contracting Officer at the end of the project. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.7 PETROLEUM PRODUCTS

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Subcontractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste.

3.8 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

In the event of a spill CSC Environmental Safety & Health must be immediately notified. Subcontractor is to take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. If the Subcontractor's response is inadequate call 911. The Subcontractor may be held responsible for spill response assistance and analysis.

The Subcontractor is required to maintain spill cleanup equipment and materials at the work site to clean up any spills or releases.

3.9 NOISE

Noise produced shall be within the limits of the Andros Island Final Governing Standards, which will be provided to the Subcontractor upon request.

-- End of Section --

SECTION 01 77 00.00 20

CLOSEOUT PROCEDURES

07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 1971	(1998; R 2005) Stewardship for the Cleaning of Commercial and Institutional Buildings
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1.2 SUBMITTALS

Contracting Organization approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

Equipment/Product Warranty List; G

Submit all manufacturers' warranties for installed equipment.

SD-11 Closeout Submittals

Record Of Materials; G

Equipment/Product Warranty List; G

1.3 PROJECT RECORD DOCUMENTS

1.3.1 Final Inspection and Punchlist

The Subcontractor shall notify the Project Engineer upon completion of work. Upon receipt of such notification the Project Engineer will schedule a final inspection, known as an Initial Operating Capacity (IOC) inspection. The purpose of the IOC is to allow the Contracting Organization and Navy representative the opportunity to perform a final inspection with the Subcontractor, and for the Contracting Organization to generate and provide the Subcontractor with a punchlist of items to be completed by the Subcontractor. A representative of the Subcontractor shall be present during the IOC inspection. The Contracting Organization will not authorize final payment to the Subcontractor until punchlist items are completed to the satisfaction of the Contracting Organization.

1.3.2 As-Built Record of Materials

Furnish a record of materials installed as part of this contract, in both hard copy and electronic format. Electronic versions shall be compatible

with Microsoft Word or Excel file formats.

Where several manufacturers' brands, types, or classes of the item listed have been used in the project, designate specific areas where each item was used. Designations shall be keyed to the areas and spaces depicted on the contract drawing. Furnish the record of materials used in the following format:

MATERIAL DESCRIPTION	MANUFACTURER	MATERIALS USED	WHERE (MANUFACTURER'S USED DESIGNATION)
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_____	_____	_____	_____
_____	_____	_____	_____

1.4 EQUIPMENT/PRODUCT WARRANTIES

1.4.1 Equipment/Product Warranty List

Furnish to the Subcontract Administrator electronic versions in PDF format of written warranties for equipment/products furnished under the contract, and prepare a complete listing of such equipment/products. The equipment/products list shall state the specification section applicable to the equipment/product, duration of the warranty therefore, start date of the warranty, ending date of the warranty, and the point of contact for fulfillment of the warranty. The warranty period shall begin on the same date as project acceptance and shall continue for the full product warranty period. Execute the full list and deliver to the Subcontract Administrator prior to final acceptance of the facility.

1.4.2 Equipment Warranty Information and Guarantor's Local Representative

Furnish with each warranty the name, address, and telephone number of the guarantor's representative nearest to the location where the equipment is installed.

1.5 CLEANUP

Provide final cleaning in accordance with ASTM E 1971. Leave premises "broom clean." Only nonhazardous cleaning materials, including natural cleaning materials, shall be used in the final cleanup. Clean interior and exterior surfaces, remove temporary labels, stains and foreign substances. Sweep paved areas and rake clean landscaped areas. Dispose of construction and demolition waste from project in provided containers. Do not burn, bury, or otherwise dispose of trash on the project site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 02 41 00

DEMOLITION

10/06

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Project Engineer. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the building.

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Existing Conditions

SD-07 Certificates

Demolition Plan

1.3 REGULATORY AND SAFETY REQUIREMENTS

Comply with local hauling and disposal regulations.

1.4 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, flooding or pollution. Sweep pavements as often as necessary to control debris.

1.5 PROTECTION

1.5.1 Existing Conditions Documentation

Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Project Engineer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Digital photographs or printed photographs sized 4 inch by 6 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Subcontractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document.

1.5.2 Items to Remain in Place

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Project Engineer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Project Engineer prior to performing such work.

1.5.3 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.5.4 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction.

1.5.5 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Contracting Organization and disconnected and sealed by the Subcontractor.

1.5.6 Facilities

Protect electrical and mechanical services and utilities. Ensure no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.5.7 Protection of Personnel

Before, during and after the demolition work the Subcontractor shall continuously evaluate the condition of the work and take immediate action to protect all personnel working in and around the project site. No area, section, or component will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.6 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.7 REQUIRED DATA

Prepare a Demolition Plan. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress. Plan shall be approved by the Contracting Organization prior to work beginning.

1.8 ENVIRONMENTAL PROTECTION

Comply with the Environmental Protection Agency requirements.

1.9 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures on site for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse on site whenever possible.

3.1.1 Utilities and Related Equipment

3.1.1.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Project Engineer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.1.2 Disconnecting Existing Utilities

Remove existing utilities as required, and terminate in a manner conforming to the nationally recognized code covering the specific utility.

3.1.2 Scrap and Removed Materials

Dispose of scrap and removed materials in provided containers, in accordance with the Waste Management Plan. All scrap materials shall be cleaned of effluent and sludge before placing in disposal containers. Cleaning shall be performed with water, and each item shall be triple rinsed. At the Subcontractor's request, detergent may be included in the wash water. Detergent may be utilized only after approval of the detergent by the Contracting Organization. All wash water shall be collected and re-introduced into the wastewater treatment system in a manner approved by the Contracting Organization.

3.1.3 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

- a. Concrete and Masonry: Completely fill holes and depressions, caused by previous physical damage or left as a result of removals with an approved masonry patching material applied in accordance with the manufacturer's printed instructions.

3.1.4 Mechanical Equipment and Fixtures

Disconnect mechanical hardware at the nearest connection to existing services to remain, unless otherwise noted. Mechanical equipment and fixtures must be disconnected at fittings. Do not remove equipment until approved and outage arrangements are completed by the Contracting Organization.

3.1.4.1 Piping

Disconnect piping at unions, flanges, valves, and fittings as required to reduce the pipe into straight lengths for practical disposal. If the piping that remains can become pressurized or filled due to upstream valve failure, end caps, blind flanges, or other types of plugs or fittings shall be attached to the open end of the pipe to ensure positive leak control.

3.1.5 Electrical Equipment and Fixtures

Salvage motors, motor controllers, and operating and control equipment that are attached to the driven equipment.

3.1.6 Items With Unique/Regulated Disposal Requirements

Remove and dispose of items with unique or regulated disposal requirements in the manner dictated by law or in the most environmentally responsible manner.

3.2 DISPOSITION OF MATERIAL

3.2.1 Title to Materials

Except for salvaged items all materials and equipment removed and not reused or salvaged, shall be disposed of in the provided containers. Showing for sale or selling materials and equipment is prohibited.

3.3 CLEANUP

Remove debris and rubbish from work site and deposit in provided containers.

-- End of Section --

SECTION 26 20 00

ELECTRICAL DISTRIBUTION SYSTEM

07/07

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM B 1	(2001; R 2007) Standard Specification for Hard-Drawn Copper Wire
ASTM B 8	(2004) Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM D 709	(2001; R 2007) Laminated Thermosetting Materials

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE Std 100	(2000) The Authoritative Dictionary of IEEE Standards Terms
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NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA TC 14	(2002) Standard for Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
NEMA TC 2	(2003) Standard for Electrical Polyvinyl Chloride (PVC) Tubing and Conduit

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2008) National Electrical Code
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UNDERWRITERS LABORATORIES (UL)

UL 1	(2005; Rev thru Jul 2007) Standard for Flexible Metal Conduit
UL 360	(2003; Rev thru Jul 2007) Liquid-Tight Flexible Steel Conduit
UL 486A-486B	(2003; Rev thru Aug 2006) Standard for Wire Connectors
UL 486C	(2004; Rev thru Aug 2006) Standard for Splicing Wire Connectors
UL 510	(2005; Rev thru Aug 2005) Polyvinyl

Chloride, Polyethylene, and Rubber
Insulating Tape

UL 514B (2004; Rev thru Aug 2007) Standard for
Conduit, Tubing and Cable Fittings

UL 651 (2005; Rev thru May 2007) Standard for
Schedule 40 and 80 Rigid PVC Conduit and
Fittings

UL 83 (2003; Rev thru Apr 2006) Standard for
Thermoplastic-Insulated Wires and Cables

1.2 DEFINITIONS

Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, shall be as defined in IEEE Std 100.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Combination motor controllers; G

SD-06 Test Reports

600-volt wiring test; G

SD-10 Operation and Maintenance Data

Electrical Systems, Data Package 5; G

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

1.4.2 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar

circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1.4.2.1 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

1.4.2.2 Material and Equipment Manufacturing Date

Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.

1.5 MAINTENANCE

1.5.1 Electrical Systems

Submit operation and maintenance manuals for electrical systems that provide basic data relating to the design, operation, and maintenance of the electrical distribution system for the UPS system. This shall include:

- a. Manufacturers' operating and maintenance manuals on active electrical equipment.

1.6 WARRANTY

The equipment shall be provided with the manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Materials, equipment, and devices shall, as a minimum, meet requirements of UL, where UL standards are established for those items, and requirements of NFPA 70.

2.2 CONDUIT AND FITTINGS

Shall conform to the following:

2.2.1 Flexible Metal Conduit

UL 1.

2.2.1.1 Liquid-Tight Flexible Metal Conduit, Steel

UL 360.

2.2.2 Rigid Nonmetallic Conduit

PVC Type EPC-40[, and EPC-80] in accordance with NEMA TC 2, UL 651[, or fiberglass conduit, in accordance with NEMA TC 14].

2.2.3 Fittings for Metal Conduit, EMT, and Flexible Metal Conduit

UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B.

2.3 WIRES AND CABLES

Wires and cables shall meet applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to site shall not be used.

2.3.1 Conductors

Conductors No. 8 AWG and larger diameter shall be stranded. Conductors No. 10 AWG and smaller diameter shall be solid. Conductor sizes and ampacities shown are based on copper, unless indicated otherwise. All conductors shall be copper.

2.3.1.1 Minimum Conductor Sizes

Minimum size for branch circuits shall be No. 12 AWG.

2.3.2 Color Coding

Provide for service, feeder, branch, control, and signaling circuit conductors. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutrals shall be white with a different colored (not green) stripe for each. Color of ungrounded conductors in different voltage systems shall be as follows:

a. 208/120 volt, three-phase

- (1) Phase A - black
- (2) Phase B - red
- (3) Phase C - blue

2.3.3 Insulation

Unless specified or indicated otherwise or required by NFPA 70, power wires shall be 600-volt, Type THHN conforming to UL 83, except that grounding wire may be type TW conforming to UL 83.

2.3.4 Bonding Conductors

ASTM B 1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B 8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

2.4 SPLICES AND TERMINATION COMPONENTS

UL 486A-486B for wire connectors and UL 510 for insulating tapes. Connectors for No. 10 AWG and smaller diameter wires shall be insulated, pressure-type in accordance with UL 486A-486B or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.5 GROUNDING AND BONDING EQUIPMENT

2.5.1 Grounding and Ground Rods

Grounding equipment shall be in accordance with NFPA 70 requirements.

2.6 MANUFACTURER'S NAMEPLATE

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

2.7 FIELD FABRICATED LABEL

ASTM D 709. Provide plastic label for motor controller. Label shall be marked with equipment number "1660ELVDSC003". Label shall be weather resistant suitable for outdoor applications, and shall have a white or yellow background with black lettering.

Affix label to the front cover of the motor controller.

2.8 Combination Motor Controllers

The motor controller shall be a Square D combination disconnect switch and motor starter, fused, 30A, 208V, 3-phase, in a NEMA 4X stainless steel enclosure.

PART 3 EXECUTION

3.1 INSTALLATION

Electrical installations, including weatherproof and hazardous locations and ducts, plenums and other air-handling spaces, shall conform to requirements of NFPA 70 and to requirements specified herein.

Coordinate all outages with the Project Engineer, giving a minimum of five (5) days notice prior to scheduled outage. Perform all work to minimize the number and duration of outages.

Protect all newly installed equipment from damage or contamination from ongoing construction activities.

3.1.1 Wiring Methods

Provide insulated conductors installed in liquid tight flexible conduit, with liquid tight fittings. Grounding conductor shall be separate from electrical system neutral conductor. Provide insulated green equipment grounding conductor for circuits installed in conduit. Minimum conduit size shall be 1/2 inch in diameter.

3.1.2 Conduit Installation

Install conduit such that adequate strain relief is incorporated.

3.1.2.1 Locknuts and Bushings

Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings

cannot be brought into firm contact with the box; otherwise, use at least minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits, and provide insulating type where required by NFPA 70.

3.1.3 Mounting Heights

Mount new controller in same location as removed controller.

3.1.4 Conductor Identification

Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, color coding shall be by factory-applied, color-impregnated insulation.

3.1.5 Splices

Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors No. 8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.

3.1.6 Covers and Device Plates

Install plates with alignment tolerance of 1/16 inch. Use of sectional-type device plates are not permitted. Provide gasket for plates installed in wet locations.

3.1.7 Grounding and Bonding

Provide in accordance with NFPA 70. Ground exposed, non-current-carrying metallic parts of electrical equipment and grounding conductor in metallic and nonmetallic raceways. Make ground connection to the existing grounding system.

3.2 FIELD QUALITY CONTROL

Furnish test equipment and personnel and submit written copies of test results. Give Contracting Officer 5 working days notice prior to test.

3.2.1 Devices Subject to Manual Operation

Each device subject to manual operation shall be operated at least five times in the presence of the Project Engineer, demonstrating satisfactory operation each time. Provide written documentation, for Project Engineer's approval, of satisfactory operation.

3.2.2 600-Volt Wiring Test

Test wiring rated 600 volt and less to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 500 volts to provide direct reading of resistance. Minimum resistance shall be 250,000 ohms.

-- End of Section --

SECTION 44 42 23

RECTANGULAR CLARIFIER

04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN BEARING MANUFACTURERS ASSOCIATION (ABMA)

ABMA 11 (1990; R 1999) Load Ratings and Fatigue Life for Roller Bearings

ABMA 9 (1990; R 2000) Load Ratings and Fatigue Life for Ball Bearings

ASME INTERNATIONAL (ASME)

ASME B17.1 (1967; R 2003) Keys and Keyseats

ASME B17.2 (1967; R 2003) Woodruff Keys and Keyseats

ASME B18.21.1 (1999; R 2005) Lock Washers (Inch Series)

ASME B18.22.1 (1965; R 2003) Plain Washers

ASTM INTERNATIONAL (ASTM)

ASTM A 153/A 153M (2005) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A 325 (2007a) Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

ASTM A 36/A 36M (2005) Standard Specification for Carbon Structural Steel

ASTM A 563 (2007a) Standard Specification for Carbon and Alloy Steel Nuts

ASTM F 593 (2002e2) Stainless Steel Bolts, Hex Cap Screws, and Studs

ASTM F 594 (2002) Standard Specification for Stainless Steel Nuts

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1 (2007) Standard for Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70

(2008) National Electrical Code

1.2 SUBMITTALS

Contracting Organization approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Contracting Organization. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Rectangular Clarifier System Design Package

SD-03 Product Data

Clarifier mechanism

Grout Materials

Electrical control system

SD-08 Manufacturer's Instructions

Rectangular Clarifier

SD-10 Operation and Maintenance Data

Rectangular Clarifier, G

Submit manufacturer's operation and maintenance data.

1.3 DELIVERY, STORAGE, AND HANDLING

Equipment and parts shall be packaged for shipment to prevent breakage and damage to components. Deliver materials to the site, inspect for damage, unload and store with a minimum of handling. Store materials off the ground and under a weathertight covering.

1.4 MANUFACTURER'S REPRESENTATIVE

Furnish the service of the clarifier equipment manufacturer's representative or technician, experienced in installation and operation of the type of systems being provided, to supervise the erection, start-up, acceptance tests, and final inspection.

1.5 WARRANTY

1.5.1 Warranty

For each product, component and system specified in this section provide a manufacturer's warranty for the specific equipment. The duration of this warranty and the remedies available to the Contracting Organization for breach of this warranty shall be defined in, and subject to, the terms and limitations of the Subcontractor's and manufacturer's standard commercial warranty, or warranties contained in this contract. The remedies available

to the Contracting Organization under this warranty shall include repair or replacement of any product which fails, is discovered, and is made known to the Subcontractor in writing within one year (365 days) after acceptance. Nothing in this warranty shall be construed to limit any rights or remedies the Contracting Organization may otherwise have under this contract.

1.6 QUALITY ASSURANCE

1.6.1 Design Package Requirements

Produce a Rectangular Clarifier System Design Package prior to procurement of material. The design package shall include drawings, narrative description of work to be performed and methods to be used, complete list of proposed materials to be installed with manufacturer's cutsheets or brochures, material safety data sheets (MSDS) as applicable to products to be used, and product specifications for all items the Subcontractor proposes for installation. The design package shall also contain manufacturer's MSDS for applicable products. The Subcontractor shall not begin work or procure material until the Contracting Organization has reviewed and approved the design package in writing. The complete assembly of with all components, mechanisms, and parts; each with an assigned number corresponding to the equipment manufacturer's parts list. Show details for each component of the clarifier mechanism including installation of piping, anchorage, wiring, and tank floor surfacing.

PART 2 PRODUCTS

2.1 Rectangular Clarifier, GENERAL

Clarifier equipment shall include clarifier mechanism, weirs and baffles, and piping. Structural steel shall conform to ASTM A 36/A 36M. Completely or intermittently submerged steel members shall have a minimum thickness of 1/4 inch.

2.2 CLARIFIER MECHANISM

Shall be a four-shaft rectangular clarifier system, including sludge collector assembly; motor and drive assembly; influent skirt and effluent trough and weir assembly; scum removal assembly; overload protection and alarm; and electrical control equipment. The drive shall rotate the sludge collector assembly, which shall be designed to move settled sludge to a centrally located sludge hopper. Mechanism shall be so designed that there will be no chains, sprockets, bearings (except sleeve bearings when used), or operating mechanism below the liquid surface or in contact with the liquid. The mechanism shall be assembled in the shop to ensure proper fitting of parts, match-marked for erection, and disassembled for shipment.

2.2.1 Design Factors

Clarifier mechanism and its component parts shall be designed, with a safety factor of 2.5, to withstand all structural and mechanical stresses brought about by continuous output rated torque load and dead load.

2.2.2 Collector System

The collector assembly shall be provided by the Subcontractor and shall include the following components:

- Drive chain - reinforced Nylon w/ 316 stainless steel pins
- Collector Chain - reinforced polyester

Skimmer Flights - Fiber Reinforced Plastic (FRP) c-channel w/lip
 Filler blocks - Polypropylene
 Wear Shoes - Nylon
 Collector Head Shaft Sprockets - Cast Nylon
 Collector Idler Sprockets - Cast Nylon
 Driven Sprocket - Cast Nylon
 Drive Sprocket Assembly - Acetal Sprocket on SS Hub
 Shear Pin - Aluminum
 Drive Chain Tightener - Acetal Sprocket/Nylon Arm
 Head Shaft(s) - cold rolled steel w/keys
 Idler Shafts - Cold Rolled Steel
 Head Shaft Wall Bearings - Cast Iron/UHMW Lined
 Shaft Support Brackets, U-Bolt/Angle - Steel
 Static Sleeve Bearings w/stainless steel bands - UHMW
 Wear Strip - UHMW-PE
 Return Track - Fiber Reinforced Plastic
 Wall Brackets/Splice - Nylon
 Motor with Gear Reducer
 Base Plate for Gear Reducer
 Drive Chain Guard - Stainless Steel
 Limit Switch Assembly
 Hardware - 316 stainless steel
 Anchor System - 316 stainless steel

2.2.3 Drive Assembly

Shall include motor, speed reduction, drive assembly bearings, and chain drives. Design of drive assembly shall be such as to permit sustained operation at the continuous output torque rating without excessive wear and to develop twice the continuous output torque rating without damage to or failure of drive assembly components.

2.2.3.1 Motor

Motor shall be constant speed, totally-enclosed, fan-cooled, horizontal or vertical type, suitable for outdoor service, and conforming to NEMA MG 1. Motor horsepower shall be as recommended by the manufacturer of the Clarifier. Motor shall be suitable for operation on 120 volt, 1-phase, 60 hertz service. Motor shall provide the starting torque needed to move sludge collector assembly from a dead stop in a dewatered clarifier tank as well as torque needed to move it from a dead stop under the maximum loading specified in paragraph entitled "Design," without overloading. Motor shall be close-coupled to or on input shaft of primary speed reducer; or shall drive speed reducer by a chain drive. Motor position shall be adjustable to increase or decrease chain tension.

2.2.3.2 Drive Assembly Bearings

Drive assembly bearings shall be ball or roller bearings having a minimum rated life expectancy (L10) as specified in this paragraph when clarifier mechanism is operating continuously at torque rating specified in paragraph entitled "Design Factors." Load rating and fatigue life shall be based on ABMA 9 and ABMA 11, as applicable. Bearings shall be either oil lubricated or grease lubricated.

Worm and primary helical gearbox bearings	L10 100,000 hours
Gearmotor, direct drive	L10 100,000 hours

2.2.3.3 Chain Drives

Chain drives incorporated in drive assembly shall include chain-and-sprocket arrangements. Chain drives shall be designed with a minimum safety factor of 4 as applied to ultimate breaking or transmission strength of the chain with respect to loads transmitted at twice the continuous output torque rating of the clarifier mechanism. Chain shall be roller type. Drive sprocket on output shaft of primary speed reducer shall be connected to shaft by a shear-pin hub arrangement designed to protect motor against overload. Design of shear-pin hub arrangement shall be such that it will not bind or freeze into position, preventing it from performing its intended function. Machinery guards shall be weather and corrosion resistant (stainless steel or aluminum).

2.2.4 Effluent Trough and Weir Assembly

Install the effluent trough/weir provided by the Contracting Organization.

2.2.5 Electrical Control System

Subcontractor shall provide wiring, liquidtight conduit and fittings, and shall make motor connection to the existing junction box.

2.2.5.1 Motor Starter and Pushbutton Station

A pushbutton actuated magnetic motor starter with overload and undervoltage protection shall be provided for the motor. Starter shall have thermal overload protection in each phase and short circuit protection. Overload protective devices shall give adequate protection to motor windings, shall be of thermal inverse-time-limit type, and shall include manual-reset type pushbutton. Pushbutton station shall be 2-button Start-Stop and shall be NEMA 4X rated.

2.2.5.2 Overload Protection and Alarm Device

Clarifier mechanism shall have an overload protection and alarm device designed to indicate load on the mechanism at all times, to sound an alarm in case of impending excessive load, and to stop the mechanism when such load is reached. The alarm device shall be of the torque-actuated or indicating-ammeter type, mounted in a NEMA 4X enclosure. Overload alarm shall include an industrial-type horn or 6 inch bell, relay, reset button, test circuit, an independent On-Off switch, and output suitable for connection to at telephone communication system. Horn or bell shall be constructed of noncorrodible material and shall be suitable for outdoor applications. The alarm device and horn shall be mounted adjacent to the motor and connected per the manufacturer's installation instructions. The Subcontractor shall install conduit and cable and make connection to the existing communications box at the Wastewater Treatment Plant.

2.2.5.3 Wiring

Control circuits shall be wired with No. 14 gage stranded, 2/64 inch insulation machine-tool wire with ring tongue compression type lugs and number tags on both ends of wires. Circuit breakers and power circuits shall be wired with necessary gauge wire per NFPA 70, minimum size No. 12 gage with wire lugs and number tags. Wires shall be secured with either plastic ties or wiring duct, or both. Wires going to components mounted on the enclosure door shall be secured in a cable-like bundle and strapped to the door and the enclosure with sufficient slack to allow easy operation of

the door. Circuits requiring field connection shall be terminated on panel terminals.

2.2.6 Lubrication Fittings

Bearings and other moving parts subject to wear shall be provided with adequate means for lubrication. Lubrication shall be by grease or oil, as suitable. Greased bearings shall be provided with fittings suitable for grease gun service. Where grease fittings would not be easily accessible, grease tubing shall be extended to a convenient location. Grease fittings shall be of a type that prevents overlubrication and build-up of pressure injurious to the bearings. Each oil reservoir shall be liberal in size and provided with an opening for filling, an overflow opening at the proper location to prevent overfilling, an oil-level sight glass, and a drain at the lowest point.

2.2.7 Key Mounted Connections

Where connections between shafts and sprockets, gears, pulleys, and other component parts are specified to be key mounted, keys and keyways shall conform to ASME B17.1 or ASME B17.2.

2.3 ANCHOR AND CONNECTING BOLTS, NUTS, AND WASHERS

Iron and steel shall be attached with zinc-coated steel, stainless steel bolts. Aluminum shall be attached with stainless steel machine bolts. Steel bolts shall conform to ASTM A 325, Type 3, maximum hardness of Rockwell "C" 32. Nuts shall conform to ASTM A 563, Grade as specified for the bolt material used. Zinc coating shall be in accordance with ASTM A 153/A 153M. Stainless steel bolts and nuts shall conform to ASTM F 593 and ASTM F 594, respectively. Stainless steel shall be AISI Type 302. Circular washers shall conform to ASME B18.22.1, lock washers to ASME B18.21.1. Bolt sizes and locations shall be as shown on the approved shop drawings for the equipment. Steel anchor bolts for center column shall be 5/8 inch diameter minimum with 2 1/2 inch projection, 9 inch embedment, and 3 inch hook on embedded end. Templates shall be furnished for accurate positioning of anchor bolts.

2.4 Grout Materials

Grout materials shall be suitable for use in water treatment plant applications. Mix and apply grout materials in accordance with manufacturer's instructions. Submit manufacturer's data sheets or brochures, and material safety data sheets (MSDS) for grout materials.

2.5 SPARE PARTS

Spare parts shall be identical and interchangeable with original parts and shall be furnished in clearly marked containers. Spare parts shall be the standard ones recommended by the manufacturer in the operation, maintenance, or instruction manual, furnished in the quantity recommended.

2.6 TOOLS

Special tools necessary for the proper maintenance and operation of the equipment shall be furnished together with a properly identified hardwood or metal box for their storage.

2.7 MATERIALS PROTECTION

The following items shall be finished in accordance with the manufacturer's standard practice suitable for end use environment: Motors, gearmotors, speed reducers, chains, sprockets, shafts, exposed drive train elements, and pushbutton stations.

PART 3 EXECUTION

3.1 GENERAL

Install clarifier equipment in accordance with the recommendations of the manufacturer of the clarifier mechanism, as approved. Take special care to correctly align equipment components. The Subcontractor shall procure the services of an engineer representative of the manufacturer of the clarifier mechanism to inspect the equipment after erection, for final inspection, startup, and acceptance tests. The representative shall also be available at the clarifier site for a period of not less than one day to instruct operating personnel during initial operation period. Subcontractor shall furnish to the Subcontract Administrator/Buyer and the Project Engineer written acceptance of the final system by the Manufacturer's engineer representative.

3.2 PIPING

Make flanged joints up tight, taking care to avoid undue strain on flanges. Align bolt holes for each flanged joint. Use full size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted. Install flanged pipe so that adjoining flange faces are not out of parallel to such degree that the flanged joint cannot be made watertight without overstraining the flange. Replace by one of proper dimension any flanged pipe or fitting whose dimensions do not allow the making of a proper flanged joint as specified herein. Provide hangers and supports where necessary to support piping.

3.3 WEIRS

Mount weir plates against a double bead of the sealant previously specified for this purpose. Use sufficient thickness of sealant to fill all voids between concrete tank and weir plates.

3.4 REPAIR PAINTING

Inspect painted surfaces for scratches, chipping, and other damage. Refinish imperfections by cleaning burrs and rough surfaces and sanding to a smooth finish, prime and repaint.

3.5 FIELD TESTS AND INSPECTIONS

3.5.1 General

The Subcontractor shall perform all field tests and provide all labor, equipment, and incidentals required for tests. The Project Engineer will witness field tests and conduct all field inspections. The Subcontractor shall give the Project Engineer a minimum of 5 working days notice of dates and times scheduled for tests.

3.5.2 Tests

Test Rectangular clarifier mechanism as in operation to demonstrate correct alignment, smooth operation, proper adjustment of drive and collection system, correct drive speed, freedom from vibration, and freedom from noise and overheating of moving machinery. Include in test at least two full cycles of successful operational sequences to demonstrate that the system continues to function satisfactorily after meeting all operational requirements.

-- End of Section --