

US Army Corps
of Engineers
Baltimore District

CONSTRUCTION SPECIFICATIONS

WEST FILTER INSTRUMENTATION

WASHINGTON AQUADUCT DIVISION
WASHINGTON, DC

INVITATION NO. **DACW31-03-B-0004**

CONTRACT NO.

DATE **NOV. 21, 2002**

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SECTION 01000

ADMINISTRATIVE REQUIREMENTS

12/98

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Cost or Pricing Data; GA|WA.

Proof of actual equipment costs.

Equipment Data; FIO.

An itemized list of serial/model numbers and equipment installed by the Contractor under this contract..

SD-06 Instructions

O and M Data; FIO.

A list of proposed maintenance and instruction manuals that is mainly used for but not limited to customized equipment.

SD-07 Schedules

Progress Schedule; GA|WA.

A schedule that shows the manner in which the Contractor intends to prosecute the work.

SD-18 Records

Title Evidence; FIO.

Proof of purchase for equipment and/or materials.

Invoice Copies; FIO.

Proof of rental equipment costs.

Photographs; FIO.

1.2 PROGRESS SCHEDULING AND REPORTING (FEB. 1985)

The Contractor, shall within five days or as otherwise determined by the Contracting Officer, after date of commencement of work, submit for approval a practicable progress schedule showing the manner in which he

intends to prosecute the work. NADB Form 1153 ("Physical Construction Progress Chart") will be furnished upon request for use in preparing this schedule. If a Contractor form is used, the same information as shown in the NADB Form 1153 shall be provided. (CENAB-CO-E)

1.3 PAYMENTS TO CONTRACTORS: (NOV 1976)

For payment purposes only, an allowance will be made by the Contracting Officer of 100 percent of the invoiced cost of materials or equipment delivered to the site but not incorporated into the construction, pursuant to the Contract Clause entitled "PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS". The Contracting Officer may also, at his discretion, take into consideration the cost of materials or equipment stored at locations other than the jobsite, when making progress payments under the contract. In order to be eligible for payment, the Contractor must provide satisfactory evidence that he has acquired title to such material or equipment, and that it will be utilized on the work covered by this contract. Further, all items must be properly stored and protected. Earnings will be computed using 100% of invoiced value. (CENAB-CO-E)

1.4 IDENTIFICATION OF EMPLOYEES: (OCT 1983)

Each employee assigned to this project by the Contractor and subcontractors shall be required to display at all times, while on the project site, an approved form of identification provided by the Contractor, as an authorized employee of the Contractor/subcontractor. In addition, on those projects where identification is prescribed and furnished by the Government, it shall be displayed as required and it shall immediately be returned to the Contracting Officer for cancellation upon release of the assigned employee and or completion of project. (CENAB)

1.5 PURCHASE ORDER: (SEP 1975)

One readable copy of all purchase orders for material and equipment, showing firm names and addresses, and all shipping bills, or memoranda of shipment received regarding such material and equipment, shall be furnished the appointed Contracting Officer's Representative as soon as issued. Such orders, shipping bills or memoranda shall be so worded or marked that all material and each item, piece or member of equipment can be definitely identified on the drawings. Where a priority rating is assigned to a contract, this rating, the required delivery date, and the scheduled shipping date shall also be shown on the purchase order. At the option of the Contractor, the copy of the purchase order may or may not indicate the purchase price. (CENAB-CO-E)

1.6 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (EFARS 52.0231.5000 (OCT 1995))

(a) This clause does not apply to terminations. See 52.249-5000, Basis for settlement of proposals and FAR Part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable conditions owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual costs data for each piece of equipment or groups of similar serial and services for which the government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs can not be determined for any piece of equipment or groups of similar

serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP1110-1-8 Construction Equipment Ownership and Operating Expenses Schedule, Region East. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the contracting officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d) (ii) and Far 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated leasees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet. CENAB-CT/SEP 95 (EFARS 52.231-5000)

1.7 REAL PROPERTY EQUIPMENT DATA: (APR 1975)

At or before the time of completion of the contract, the Contractor shall submit to the Contracting Officer a complete itemized list, including serial and model number where applicable, showing the unit retail value of each Contractor furnished item of mechanical, electrical and plumbing equipment installed by the Contractor under this contract. For each of the items which is specified herein to be guaranteed for a specified period from the date of acceptance thereof, either for beneficial use or final acceptance, whichever is earlier, against defective materials, design, and workmanship, the following information shall be given: the name, address and telephone number of the Subcontractor, Equipment Supplier, or Manufacturer originating the guaranteed item. The list shall be accompanied by a copy of the specific guarantee document for each item which is specified herein to be guaranteed if one had been furnished to the Contractor by the Equipment Supplier or Manufacturer. The Contractor's guarantee to the Government of these items will not be limited by the terms of any manufacturer's guarantee to the Contractor. Baltimore District NADB Form 1019 may be utilized for the itemized listing and will be made available to the Contractor upon request. (CENAB-CO-E)

1.8 O and M DATA: (JUL 1979)

The requirements for furnishing operating and maintenance data and field instruction are specified elsewhere in the specifications. The Contractor shall submit to the Contracting Officer, at a time prior to the 50% project completion time, a list of proposed maintenance and instruction manuals to be furnished the Government and the scheduled dates of all required field instructions to be provided by Contractor furnished personnel or manufacturer's representatives. All maintenance and instruction manuals must be furnished to the Contracting Officer at least 2 weeks prior to the scheduled dates of any required Contractor furnished field instructions or

at least one month prior to project completion if no Contractor furnished field instructions are required. Contractor shall furnish seven (7) complete sets of all operation and maintenance data. (CENAB)

1.9 FACILITY SECURITY CLEARANCE:

The Dalecarlia Water Treatment Plant is a secure site. All employees of the Contractor and his subcontractors will be briefed on and will be required to follow all security measures.

1.10 NEGOTIATED MODIFICATIONS: (OCT 84)

Whenever profit is negotiated as an element of price for any modification to this contract with either prime or subcontractor, a reasonable profit shall be negotiated or determined by using the OCE Weighted Guidelines method outlined in EFARS 15.902. (Sugg. NAB 84-232)

1.11 PHOTOGRAPHS

PHOTOGRAPHIC COVERAGE: (SEP 85) The Contractor shall provide photographic coverage under the contract. These services shall be for ten commercial grade color photographs every three months from the beginning of the contract until acceptance of the completed work. These photographs shall be in 8" x 10" (203.4 mm x 254 mm) size and shall be taken at intervals and at the place designated by the Contracting Officer. Negatives from all of the above photographs shall be given to and become the property of the Government. (CENAB-CO)

1.12 PARTNERING: (NOV 92)

In order to most effectively accomplish this contract, the Government is willing to form a cohesive partnership with the Contractor and its subcontractors. This partnership would strive to draw on the strengths of each organization in an effort to achieve a quality project done right the first time, within budget and on schedule. This partnership would be bilateral in make-up and participation will be totally voluntary. Any cost associated with effectuating this partnership will be agreed to by both parties and will be shared equally with no change in contract price. (CENAB-EN-DT)

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

NOT APPLICABLE

-- End of Section --

SECTION 01005

SHUTDOWN AND SCHEDULING REQUIREMENTS

3/01

PART 1 GENERAL

1.1 OPERATION OF EXISTING FACILITIES AND SHUTDOWNS

1.1.1 Work under this Contract shall not unduly interfere with the operation of the water treatment plant. Continual delivery of potable water by this water treatment plant shall be maintained at all times.

1.1.2 Work under this Contract shall be executed in such a fashion that the existing facilities may be kept in continuous operation or readiness except for scheduled shutdowns.

1.1.3 Shutdowns of the existing facilities will be arranged at the convenience of the water plant staff. No shutdowns shall be commenced without specific permission from the Contracting Officer's Representative. The Contracting Officer's Representative and plant staff shall be notified at least 15 days prior to each shutdown.

1.1.4 The Contracting Officer's Representative reserves the right to cancel scheduled shutdowns, if conditions warrant. Delays to the Contractor caused by cancellations will be considered in evaluating requests for time extensions only. No additional compensation shall be considered.

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Schedules

Shutdown Plan; GA|WA.

The Contractor shall submit to the Contracting Officer's Representative for approval a plan consisting of a construction sequence, time schedule, detailed breakdown of Work to be completed prior to and during shutdown, materials required and availability, list of valves that will require operation by plant staff and any details to adequately described proposed shutdown. The plan shall demonstrate ability to meet the time limitations.

1.3 SCHEDULING REQUIREMENTS

1.3.1 All equipment and supplies required to complete the Work during each shutdown period, shall be on-site before any facilities are taken out of service. Contractor shall field verify all existing conditions which may impact installation of proposed items.

1.3.2 Insofar as possible, all equipment to be incorporated into existing facilities, shall be ready for installation before the existing facilities are shutdown. Particular attention must be paid to the identification of wiring required to transfer power and monitor and control existing and new

equipment. The Contractor shall identify the conduit and wiring required to ensure the prior work specified for each shutdown will be complete and that the re-start of equipment will not be delayed.

1.3.3 Operation of all existing valves required for the Work shall be performed by the Plant staff. Government does not guarantee that valves will be 100 percent water or gas tight.

1.3.4 If the Work, during shutdown periods, is not done satisfactorily, or as planned, or within the time required or approved by the Contracting Officer's Representative, the Contracting Officer's Representative may order the Contractor to work a 24-hour, 7-day a week work schedule with full crew, or he may order the Contractor to place the facility back in service and reschedule the shutdown or, he may order the Work required to place the facility back in service done with other forces. If the work is done by other forces, the Government's costs will be deducted from the amounts due to the Contractor. In no case shall the Government be required to make additional payments for overtime work or redoing Work due to the Contractor's failure to complete the work in the allotted time.

1.3.5 The following is a list showing the extent of the shutdowns that will be permitted. It shall be used as a guide to prepare the required construction schedule. It is not necessarily complete. The list of work required to be performed during and prior to the specific shutdown period may not be complete. Contractor is solely responsible for scheduling the shutdowns in conjunction with the anticipated construction sequence.

1.3.6 Contractor shall maintain access for plant staff to areas of the plant which are in service.

1.3.7 Shutdowns

1.3.7.1 Shutdown of Filters 27-36:

- a. General Description: Shutdown of filters to allow for specified demolition and new work.
- b. Shutdown Requirements: Only one (1) filter shall be taken out of service at any given time.
- c. Work to be completed during shutdown:
 - 1) Demolition of all indicated piping, conduit and equipment, associated with out-of-service filter.
 - 2) Installation of all new piping, conduit and equipment, associated with out-of-service filter.
 - 3) Connection of specified filter equipment to Plant SCADA system and Filter Control Console.
 - 4) Testing remote control of filter equipment.

1.3.7.2 Shutdown of Compressed Air Headers:

- a. General Description: Shutdown of compressed air header for replacement as indicated on the Drawings, and for connection of valve pneumatic supply lines. Shutdown may take place as one shutdown for replacement of the entire section, or as multiple shutdowns for replacement of

smaller sections.

b. Maximum Duration: 2 hours.

c. Shutdown Requirements:

1) Shutdown(s) shall be coordinated with plant staff.

2) At end of each shutdown period, compressed air shall be supplied in a continuous and reliable manner, to all filters remaining in service.

d. Work to be completed during shutdown:

1) Replacement, in part or in whole, of the compressed air header as indicated on the Drawings.

2) Connection of all valve pneumatic supply lines.

1.3.7.3 Shutdown of Piping Containing Venturis:

a. General Description: Isolation and disassembly of piping as required for removal of backwash and surface wash venturi meter inserts for on-site inspection, as specified. One shutdown shall occur for the East Filter venturis, and a separate shutdown shall occur for the West Filter venturis. Similar shutdowns shall occur for venturi meter insert re-installation.

b. Maximum Duration: 8 hours per shutdown.

c. Shutdown Requirements:

1) Shutdown shall be coordinated with plant staff.

2) At the end of the shutdown, piping shall function in a continuous and reliable manner.

3) Shutdowns for venturi removal and re-installation shall occur between September 15, 2002 and May 15, 2003.

d. Prior Work:

1) Venturi Meter Inspector shall be scheduled to commence inspection of the removed venturis within 24 hours of their removal.

2) All items required to reassemble piping following venturi removal, or re-installation, shall be on-site.

e. Work to be completed during shutdown:

1) Plant staff shall close appropriate isolation valves.

2) Disassemble piping as required to remove, or re-install, venturi meter inserts.

3) Reconnect piping after venturi removal with spacer ring or similar items as required.

1.3.7.4 Shutdown of West Filter Building Electrical Power:

- a. General Description: Shutdown of West Filter Building electrical power for replacement of wiring as indicated on the Drawings, and for connection to new equipment. Shutdown may take place as one shutdown for replacement of the entire section, or as multiple shutdowns for replacement of smaller sections.
- b. Maximum Duration: 2 hours.
- c. Shutdown Requirements:
 - 1) Shutdown(s) shall be coordinated with plant staff.
 - 2) At end of each shutdown period, power shall be supplied in a continuous and reliable manner, to all filters remaining in service.
- d. Work to be completed during shutdown:
 - 1) Replacement, in part or in whole, of the electrical wiring as indicated on the Drawings.

1.3.7.5 Shutdown of West Filter Building SCADA Monitoring:

- a. General Description: Shutdown of West Filter Building SCADA monitoring for connection of new wiring as indicated on the Drawings, and for connection to new equipment. Shutdown may take place as one shutdown for replacement of the entire section, or as multiple shutdowns for replacement of smaller sections.
- b. Maximum Duration: 2 hours.
- c. Shutdown Requirements:
 - 1) Shutdown(s) shall be coordinated with plant staff.
 - 2) At end of each shutdown period, SCADA signals shall be supplied in a continuous and reliable manner, to all filters remaining in service.
- d. Work to be completed during shutdown:
 - 1) Replacement, in part or in whole, of the SCADA wiring as indicated on the Drawings.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

NOT APPLICABLE

-- End of Section --

SECTION 01050

JOB CONDITIONS
03/99

PART 1 GENERAL

1.1 LAYOUT OF WORK

The Contractor shall lay out his work and shall be responsible for all measurements in connection therewith. The Contractor shall furnish, at his own expense, all templates, platforms, equipment, tools and materials and labor as may be required in laying out any part of the work. The Contractor will be held responsible for the execution of the work to such lines and elevations shown on the drawings or indicated by the Contracting Officer. (CENAB)

1.2 PHYSICAL DATA: (APR 1984)

Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation or conclusion drawn from the data or information by the Contractor. (CENAB)

1.2.1 Transportation Facilities

The principal access route to the Washington Aqueduct is MacArthur Boulevard. Public bus service is provided by the Washington Metropolitan Area Transit Authority.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Schedules

Shut Down Request; GA|WA.

Prior approval for service/utility interruptions.

Advance Notice; FIO.

When changes and/or relocations are required.

1.4 UTILITIES

1.4.1 Availability of Utilities Including Lavatory Facilities: (JUN 1980)

It shall be the responsibility of the Contractor to provide all utilities he may require during the entire life of the contract. He shall make his own investigation and determinations as to the availability and adequacy of utilities for his use for construction purposes and domestic consumption. He shall install and maintain all necessary supply lines, connections,

pipng, and meters if required, but only at such locations and in such manner as approved by the Contracting Officer. Before final acceptance of work under this contract, all temporary supply lines, connections and piping installed by the Contractor shall be removed by him in a manner satisfactory to the Contracting Officer. (CENAB)

1.4.2 Interruption of Utilities: (1972)

a. No utility services shall be interrupted by the Contractor to make connections, to relocate, or for any purpose without approval of the Contracting Officer.

b. Permission for a shut down request for services shall be submitted in writing to the Contracting Officer not less than 15 days prior to date of proposed interruption. The request shall give the following information:

c. Nature of Utility (Gas, L.P. or H.P., Water, Etc.)

d. Size of line and location of shutoff.

e. Buildings and services affected.

f. Hours and date of shutoff.

g. Estimated length of time service will be interrupted.

h. Services will not be shut off until receipt of approval of the proposed hours and date from the Contracting Officer.

i. Refer to Section 01005 for additional requirements.

1.5 DISPOSAL OF EXISTING MATERIAL AND EQUIPMENT: (DEC 1975)

All removed, dismantled or demolished material and/or equipment including rubble, scrap and debris not specified or indicated to be Government salvaged, reinstalled under this contract or otherwise retained for disposal on Government land will become the property of the Contractor and shall be promptly removed from the site and disposed of by the Contractor at his own expense and responsibility. (CENAB)

1.6 COMPLIANCE WITH POST/BASE REGULATIONS: (JUL 1980)

The site of the work is on a non-military reservation and all rules and regulations issued by the Chief, Washington Aqueduct covering general safety, security, sanitary requirements, pollution control, traffic regulations and parking, shall be observed by the Contractor. Information regarding these requirements may be obtained by contacting the Contracting Officer, who will provide such information or assist in obtaining same from appropriate authorities. (MEMO)

1.7 MAINTENANCE OF ACCESS: (DEC 1975)

The Contractor shall not block passage through sidewalks, roads, alleys or other entranceways to the building during performance of work under this contract. In addition, the Contractor shall at all times maintain safe and clear passage through interior corridors and doorways to allow minimal disruption of normal activities within the building. No equipment or new materials are to be stored in the building except

those items that are necessary for progress of the immediate work.

All existing equipment, materials and debris removed during the work that are not to be reinstalled shall be removed daily by the Contractor from the building. (CENAB)

1.8 PROTECTION OF GOVERNMENT PROPERTY AND PERSONNEL: (DEC 1975)

1.8.1 Protection of Equipment

All existing Government owned equipment within the work area shall be protected by the Contractor from damage caused by construction operations. As a minimum, the Contractor shall cover all furniture, equipment and carpets in the work area with dust barriers and protect such items from any damage due to dust, vibration, water, heat or other conditions resulting from construction activities. Existing work damaged by construction operations shall be promptly repaired by the Contractor at his own expense.

1.8.2 Protection of Personnel

The Contractor shall protect occupants of the building by installing safety rails and/or barricades as applicable to prevent injury from unauthorized entry of personnel into work areas. Warning signs shall be erected as necessary to indicate Construction areas or hazardous zones. Work shall proceed in such manner as to prevent the undue spread of dust and flying particles.

1.8.3 Measures to Prevent Damage/Injury

The Contractor shall take such additional measures as may be directed by the Contracting Officer to prevent damage or injury to Government property or personnel. (CENAB)

1.9 STREET CLOSINGS: (MAY 1978)

When operations in connection with contract work necessitate the closing of streets, it shall be the Contractor's responsibility to arrange in advance with the Contracting Officer for such street closings and to provide appropriate barricades, signs, markers, flares, and other devices as may be required by the Contracting Officer's Representative for traffic guides and public safety. (CENAB)

1.10 ORDER OF WORK AND COORDINATION WITH OTHER CONTRACTORS: (FEB 1979)

Other Contractors are presently working in the same area. After award of this contract a meeting will be held with all contractor representatives and the Contracting Officer to develop a plan of work coordination. In case of disagreement regarding use of an area the decision of the Contracting Officer will control. (CENAB)

1.11 ASBESTOS HANDLING AND REMOVAL (FEB 85)

Through site investigations, friable asbestos has not been found, however if asbestos is encountered, its testing, removal and disposal is covered in "CHANGES" clause of the Contract Clauses. (CENAB)

1.12 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

1.12.1 Procedure for Determination

This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance the contract clause entitled "Default: (Fixed Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

1.12.2 Anticipated Adverse Weather Delays

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4	5	6	7	6	6	6	5	2	5	4	3

1.12.3 Impact

Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in the paragraph above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)".

1.13 WORKING HOURS

WORKING HOURS: (DEC 93) It shall be the Contractors responsibility to obtain the working hours other than the normal five (5) day work week 07:00 am to 3:30 pm, Monday through Friday, with the exception of Federal Government holidays. Request for extended working hours must be submitted

in writing to the Contracting Officer for approval.

1.14 CRYSTALLINE SILICA CONTAINING PRODUCTS

If any activities disturb crystalline silica containing products such as concrete, block, or sand, Contractor shall comply with Appendix C of EM 385-1-1.

1.15 PAINT CONTAINING LEAD

If any activities occur that disturb paint containing lead, Contractor shall comply with Section 13281, and OSHA 29 CFR 1926.62.

1.16 LIGHT FIXTURES CONTAINING PCBs

If any light fixtures containing PCBs are removed as part of this project, Contractor shall comply with all EPA, state, and local requirements for handling and disposal of the PCBs.

1.17 FOSSIL FUEL-POWERED EQUIPMENT WITHIN BUILDINGS

If fossil fuel-powered equipment is used inside buildings or other enclosed areas, Contractor shall keep carbon monoxide concentrations below an 8-hour, time-weighted average of 25 PPM. Contractor shall provide documentation of regular air monitoring to confirm that concentrations are below 25 PPM.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

NOT APPLICABLE

-- End of Section --

SECTION 01060

SAFETY
05/97

PART 1 GENERAL

1.1 APPLICABLE PUBLICATION

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

U.S. ARMY CORPS OF ENGINEERS:

EM 385-1-1 (3 Sep 1996) U.S. Army Corps of Engineers
Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Safety Supervisor; FIO.

A safety supervisor shall be responsible for overall supervision of accident prevention activities.

SD-09 Reports

Activity Phase Hazard Analysis Plan; FIO.

The addressing of the activity phase hazard analysis plan for each activity performed in a phase of work.

Outline Report; GA|WA.

A report for each past activities review.

OSHA Log; FIO.

A log shall be reported monthly for injuries.

SD-18 Records

Language Certificate; GA|WA.

It is the Contractors responsibility besure that all employees understand the basic english language.

1.3 GENERAL

The U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, and all subsequent revisions referred to in the Contract Clause ACCIDENT PREVENTION of this contract, are hereby supplemented as follows:

a. The Contractor shall designate an employee responsible for overall supervision of accident prevention activities. Such duties shall include: (1) assuring applicable safety requirements are (a) communicated to the workers in a language they understand (reference EM 385-1-1, September 1996, 01.A.04). It is the Contractor's responsibility to ascertain if there are workers on the job who do not speak and/or understand the English language. If such workers are employed by the prime contractor or subcontractors, at any tier, it is the prime contractor's responsibility to insure that all safety programs, signs, and tool box meetings are communicated to the workers in a language they understand, and that a bilingual employee is on site at all time. If the contractor contends that interpreters and/or bilingual signs are not required, certification must be provided which verifies that all workers (whose native tongue is other than English) have a command of the English language sufficient to understand all direction, training and safety requirements, whether written or oral, and (b) incorporated in work methods, and (2) inspecting the work to ensure that safety measures and instructions are actually applied. The proposed safety supervisor's name and qualifications shall be submitted in writing for approval to the Contracting Officer's Representative. This individual must have prior experience as a safety engineer or be able to demonstrate his/her familiarity and understanding of the safety requirements over a prescribed trial period. The safety engineer shall have the authority to act on behalf of the Contractor's general management to take whatever action is necessary to assure compliance with safety requirements. The safety supervisor is required to be on the site when work is being performed.

b. Prior to commencement of any work at a job site, a preconstruction safety meeting shall be held between the Contractor and the Corps of Engineers Area/Resident Engineer to discuss the Contractor's safety program and in particular to review the following submittals:

(1) Contracts Accident Prevention Plan: An acceptable accident prevention plan, written by the prime Contractor for the specific work and implementing in detail the pertinent requirements of EM 385-1-1, shall be submitted for Government approval.

(2) Activity Phase Hazard Analysis Plan: Prior to beginning each major phase of work, an activity hazard analysis (phase plan) shall be prepared by the Contractor for that phase of work and submitted to the Contracting Officer's Representative for approval. A phase is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform work. The analysis shall address the hazards for each activity performed in the phase and shall present the procedures and safeguards necessary to eliminate the hazards or reduce the risk to an acceptable level.

c. Subsequent jobsite safety meetings shall be held as follows:

(1) A safety meeting shall be held at least once a month for all supervisors on the project to review past activities, to plan ahead for new or changed operations and to establish safe working procedures to anticipated hazards. An outline report of each monthly meeting shall be

submitted to the Contracting Officer's Representative.

(2) At least one safety meeting shall be conducted weekly, or whenever new crews begin work, by the appropriate field supervisors or foremen for all workers. An outline report of the meeting giving date, time, attendance, subjects discussed and who conducted it shall be maintained and copies furnished the designated authority on request.

1.4 ACCIDENTS

Chargeable accidents are to be investigated by both Contractor personnel and the Contracting Officer.

1.4.1 Accident Reporting, ENG FORM 3394

Section 1, Paragraph 01.D, OF EM 385-1-1 and the Contract Clause entitled ACCIDENT PREVENTION are amended as follows: The prime Contractor shall report on Eng Form 3394, supplied by the Contracting Officer, all injuries to his employees or subcontractors that result in lost time and all damage to property and/or equipment in excess of \$2,000 per incident. Verbal notification of such accident shall be made to the Contracting Officer within 24 hours. A written report on the above noted form shall be submitted to the Contracting Officer within 72 hours following such accidents. The written report shall include the following:

a. A description of the circumstances leading up to the accident, the cause of the accident, and corrective measures taken to prevent recurrence.

b. A description of the injury and name and location of the medical facility giving examination and treatment.

c. A statement as to whether or not the employee was permitted to return to work after examination and treatment by the doctor, and if not, an estimate or statement of the number of days lost from work. If there have been days lost from work, state whether or not the employee has been re-examined and declared fit to resume work as of the date of the report.

1.4.2 OSHA Requirements

1.4.2.1 OSHA Log

A copy of the Contractor's OSHA Log of Injuries shall be forwarded monthly to the Contracting Officer.

1.4.2.2 OSHA Inspections

Contractors shall immediately notify the Contracting Officer when an OSHA Compliance official (Federal or State representative) presents his/her credentials and informs the Contractor that the workplace will be inspected for OSHA compliance. Contractors shall also notify the Contracting Officer upon determination that an exit interview will take place upon completion of the OSHA inspection. (NABSA OCT 05, 1976)

1.5 GOVERNMENT APPROVAL

Submittals shall be in accordance with Section 01330 SUBMITTAL PROCEDURES. All required submittals of items specified in this section shall be for information only, except for those items including, but not limited to, the following which shall be submitted for Government approval:

SECTION 01200

WARRANTY REQUIREMENT
06/99

PART 1 GENERAL

1.1 WARRANTY OF CONSTRUCTION

The Contractor shall warranty all materials and workmanship in accordance with Contract Clause (FAR 52.246-21), "WARRANTY OF CONSTRUCTION"

1.2 MANUFACTURER'S WARRANTY:

The Contractor shall provide manufacturer's warranties, when available, on all equipment for one year starting from the day of facility acceptance by the Government. Any warranty offered by the manufacturer for periods greater than one year or required by other sections of the specifications shall also be provided.

1.3 WARRANTY PAYMENT

Warranty work is a subsidiary portion of the contract work, and has a value to the Government of 1 percent of the project cost. The Contractor will assign a value of that amount in the breakdown for progress payments mentioned in the Contract Clause (FAR 52.232-5) "Payments Under Fixed-Price Construction". If the Contractor fails to respond to warranty items as provided in paragraph CONTRACTOR'S RESPONSE TO WARRANTY SERVICE REQUIREMENTS below, the Government may elect to acquire warranty repairs through other sources and, if so, shall backcharge the Contractor for the cost of such repairs. Such backcharges shall be accomplished under the Contract Clause (FAR 52.243-4) "CHANGES" of the contract through a credit modification(s).

1.4 PERFORMANCE BOND:

The Contractor's Performance Bond will remain effective throughout the construction warranty period and warranty extensions.

1.4.1 Failure to Commence

In the event the Contractor or his designated representative(s) fail to commence and diligently pursue any work required under this clause, and in a manner pursuant to the requirements thereof, the Contracting Officer shall have the right to demand that said work be performed under the Performance Bond by making written notice on the surety. If the surety fails or refuses to perform the obligation it assumed under the Performance Bond, the Contracting Officer shall have the work performed by others, and after completion of the work, may demand reimbursement of any or all expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

1.5 PRE-WARRANTY CONFERENCE:

Prior to contract completion and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this

specification. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be reviewed at this meeting. The Contractor shall provide names, addresses, and telephone numbers of all subcontractors, equipment suppliers, or manufacturers with specific designation of their area of responsibilities if they are to be contacted directly on warranty corrections. This point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. Minutes of the meeting will be prepared by the Government and signed by both, the Contractor and the Contracting Officer. The minutes shall become part of the contract file.

1.6 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-14 Samples

Sample Tags; FIO.

To identify the warranty for all Contractor and Government furnished equipment which the Contractor installs.

1.7 ADDITIONAL REQUIREMENTS

1.7.1 Equipment Warranty Identification Tags:

The Contractor shall provide warranty identification tags on all Contractor and Government furnished equipment which he has installed.

1.7.1.1 Format and Size for Tags

The tags shall be similar in format and size to the exhibits provided by this specification, they shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation. etc. . These tags shall have a permanent pressure-sensitive adhesive back, and they shall be installed in a position that is easily (or most easily) noticeable. Contractor furnished equipment that has differing warranties on its components will have each component tagged.

1.7.1.2 Sample Tags

Sample tags shall be filled out representative of how the Contractor will complete all other tags. These tags shall be submitted to the Government.

1.7.1.3 Tags for Warranted Equipment:

The tag for this equipment shall be similar to the following. Exact format and size will be as approved.

EQUIPMENT WARRANTY CONTRACTOR FURNISHED EQUIPMENT	
MFG: _____	MODEL NO.: _____
SERIAL NO.: _____	CONTRACT NO.: _____
CONTRACTORS NAME: _____	
CONTRACTOR WARRANTY EXPIRES: _____	
MFG WARRANTY (IES) EXPIRE: _____	

EQUIPMENT WARRANTY GOVERNMENT FURNISHED EQUIPMENT	
MFG: _____	MODEL NO.: _____
SERIAL NO.: _____	CONTRACT NO.: _____
DATE EQUIPMENT PLACED IN SERVICE: _____	
MFG WARRANTY (IES) EXPIRES: _____	

1.7.1.4 Execution

The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. All tags shall be mechanically attached to the equipment as directed by the Contracting Officer.

1.7.1.5 Equipment Warranty Tag Replacement.

The contractor shall provide new tags on repaired or replaced equipment during the warranty period. The tag shall be identical to the original tag, except that the Contractor's warranty expiration date shall be updated to show the correct warranty expiration date.

1.8 CONTRACTOR'S RESPONSE TO WARRANTY SERVICE REQUIREMENTS.

1.8.1 Notification to Warranty Service Requirements

Following oral or written notification by authorized representative of the installation designated in writing by the Contracting Officer, the Contractor shall respond to warranty service requirements in accordance with the "Warranty Service Priority List" and the three categories of priorities listed below.

1.8.1.1 Categories of Priorities

- a. First Priority Code 1: Perform on site inspection to evaluate situation, determine course of action, initiate work within 24 hours and work continuously to completion or relief.
- b. Second Priority Code 2: Perform on site inspection to evaluate situation, determine course of action, initiate work within 48 hours and work continuously to completion or relief.
- c. Third Priority Code 3: All other work to be initiated within 5 work days and work continuously to completion or relief.

1.8.1.2 Warranty Service Priority List

ELECTRICAL:

Code 1:

- a. Power failure (entire area or any building operational after 1600 hours).
- b. Security lights.

Code 2:

- a. Power failure (no Power to a room or part of building),
- b. Receptacle and lights.
- c. Fire alarm systems.

PLUMBING

Code 2

- a. Valves.
- b. Water pipe leaking.

GENERAL FILTER OPERATION

Code 2

- a. Filter fails to operate properly in any manner (including proper communication).

1.8.2 Availability of Required Parts

Should parts be required to complete the work and the parts are not immediately available the Contractor shall have a maximum of 12 hours after arrival at the job site to provide authorized representative of the installation with firm written plan for emergency alternatives and temporary repairs for Government participation with the Contractor to provide emergency relief until the required parts are available on site for the Contractor to perform permanent warranty repair. The Contractors plan shall include a firm date and time that the required parts shall be available on site to complete the permanent warranty repair.

PART 2 PRODUCTS
NOT APPLICABLE

PART 3 EXECUTION
NOT APPLICABLE

-- End of Section --

SECTION 01330
SUBMITTAL PROCEDURES
09/97

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers as follows:

- SD-01 Data
- SD-04 Drawings
- SD-06 Instructions
- SD-07 Schedules
- SD-08 Statements
- SD-09 Reports
- SD-13 Certificates
- SD-14 Samples
- SD-18 Records
- SD-19 Operation and Maintenance Manuals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.2.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. Submittal Register ENG FORM 4288, column labeled "Reviewer", this column is blank and is understood that the reviewer is "WA" (Washington Aqueduct).

1.3 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any

error which may exist, as the Contractor under the CQC requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.5 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each item shall be stamped, signed, and dated by the CQC representative indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

At the end of this section is one set of ENG Form 4288 listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Contractor will also be given the submittal register as a diskette containing the computerized ENG Form 4288 and instructions on the use of the diskette. Columns "d" through "r" have

been completed by the Government; the Contractor shall complete columns "a" and "s" through "u" and submit the forms (hard copy plus associated electronic file) to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The Contractor shall keep this diskette up-to-date and shall submit it to the Government together with the monthly payment request. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. The submittal register and the progress schedules shall be coordinated.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 15 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

3.4 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE

Six (6) copies of submittals shall be made as follows:

3.5.1 Procedures

In the signature block provided on ENG Form 4025 the Contractor certifies that each item has been reviewed in detail and is correct and is in strict conformance with the contract drawings and specifications unless noted otherwise. The accuracy and completeness of submittals is the responsibility of the Contractor. Any costs due to resubmittal of documents caused by inaccuracy, lack of coordination, and/or checking shall be the responsibility of the Contractor. This shall include the handling and review time on the part of the Government. Each variation from the contract specifications and drawings shall be noted on the form; and, attached to the form, the Contractor shall set forth, in writing, the reason for and description of such variations. If these requirements are not met, the submittal may be returned for corrective action.

3.5.2 Responsibility

The Contractor is responsible for the total management of his work. The quantities, adequacy and accuracy of information contained in the submittals are the responsibility of the Contractor. Approval actions taken by the Government will not in any way relieve the Contractor of its quality control requirements.

3.5.3 Additional Requirements

The above is in addition to the requirements set forth in Contract Clause entitled "Specifications and Drawings for Construction." (ER 415-1-10)

3.5.4 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Five copies of the submittal will be retained by the Contracting Officer and two copies of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.9 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

<p>CONTRACTOR</p> <p>(Firm Name)</p> <p>_____ Approved</p> <p>_____ Approved with corrections as noted on submittal data and/or attached sheets(s).</p> <p>SIGNATURE: _____</p> <p>TITLE: _____</p> <p>DATE: _____</p>

-- End of Section --

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

A --	Approved as submitted.	E --	Disapproved (See attached).
B --	Approved, except as noted on drawings.	F --	Receipt acknowledged.
C --	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX --	Receipt acknowledged, does not comply as noted with contract requirements.
D --	Will be returned by separate correspondence.	G --	Other (Specify)
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

(Reverse of ENG Form 4025-R)

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H #	G O V T C L A S S I F I C A T I O N A R E T I V E S	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R I M A L A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H	D A T E F W D T O O T H R E V I E W E R	D A T E R C D F R O M O T H R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01000	SD-01 Data														
			Cost or Pricing Data	1.1	GA WA												
			Equipment Data	1.1	FIO												
			SD-06 Instructions														
			O and M Data	1.1	FIO												
			SD-07 Schedule														
			Progress Schedule	1.1	GA WA												
			Modified Chart	1.1	GA WA												
			SD-18 Records														
			Title Evidence	1.1	FIO												
			Invoice Copies	1.1	FIO												
			Photographs	1.1	FIO												
		01005	SD-07 Schedules														
			Shutdown Plan	1.2	GA WA												
		01050	SD-07 Schedules														
			Shutdown Request	1.3	GA WA												
			Advance Notice	1.3	FIO												
		01060	SD-01 Data														
			Safety Supervisor	1.2	FIO												
			SD-09 Reports														
			Activity Phase Hazard	1.2	FIO												

SUBMITTAL REGISTER

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A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H #	G O V T C L A S S I F I C A T I O N A R E T I V E C O D E	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R / D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H / A U T H	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H E R R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			Analysis Plan														
			Outline Report	1.2	GA WA												
			OSHA Log	1.2	FIO												
			SD-18 Records														
			Language Certificate	1.2	GA WA												
		01200	SD-14 Samples														
			Sample Tags	1.6	FIO												
		01451	SD-01 Data														
			CQC Plan	1.3	GA WA												
			SD-06 Instructions														
			CQC Plan	1.3	GA WA												
			SD-07 Schedule														
			CQC Plan	1.3	GA WA												
			SD-08 Statements														
			Change Notification	1.3	FIO												
			Phase Notification	1.3	FIO												
			Punchlist	1.3	FIO												
			SD-09 Reports														
			CQC Plan	1.3	GA WA												
			Request	1.3	GA WA												

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Dalecarlia Water Treatment Plant – West Filter Controls																	
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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			Tests	1.3	FIO												
			Test Reports	1.3	FIO												
			SD-13 Certification														
			CQC Plan	1.3	GA WA												
			CQC Mgr Qualification	1.3	GA WA												
		01451	SD-14 Samples														
			CQC Mgr Qualification	1.3	GA WA												
			SD-18 Records														
			CQC Plan	1.3	GA WA												
			Minutes	1.3	FIO												
			CQC Mgr Qualification	1.3	GA WA												
			Tests Performed	1.3	FIO												
			QC Records	1.3	GA WA												
		01562	SD-01 Pre-Construction Implementation	1.1	GA WA												
		01720	SD-01 Data														
			CADD Files	1.3	FIO												
			SD-04 Drawings														
			Progress Prints	1.3	GA WA												
			Final Prints	1.3	GA WA												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION ITEM SUBMITTED	P A R A G R A P H	G O V T C L A S S I F I C A T I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R / D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H / D A T E R C D F R O M C O N T R	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H R E V I E W E R	C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02120	SD-03 Product Data														
			On-site Hazardous Waste Management	1.2	G WA												
			Notices of Non-Compliance and Notices of Violation	1.2	FIO												
			SD-07 Certificates														
			Shipping Documents and Packages Certification	1.2	G WA												
		02220	SD-03 Product Data														
			Work Plan	1.3	GA WA												
		03252	SD-01 Data														
			Anchor Bolts	1.3	GA WA												
			Wedge Expansion Anchors	1.3	GA WA												
			Concrete Inserts	1.3	GA WA												
			Adhesive Anchors for Concrete	1.3	GA WA												
		03307	SD-03 Product Data														
			Air-Entraining Admixture	1.2	GA WA												
			Accelerating Admixture	1.2	GA WA												
			Water-Reducing or Retarding Admixture	1.2	GA WA												
			Curing Materials	1.2	GA WA												
			Reinforcing Steel	1.2	GA WA												
			Batching and Mixing	1.2	FIO												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR												
Dalecarlia Water Treatment Plant – West Filter Controls																		
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H G #	G O V T C L A S S I F I C A T I O N A R E T I V E R E V I E W E R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY						M A I L E D T O C O N T R I B U T I O N D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H / A U T H	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H E R R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
			Equipment															
			Conveying and Placing Concrete	1.2	FIO													
			Formwork	1.2	FIO													
			SD-06 Test Reports															
			Aggregates	1.2	GA WA													
			Concrete Mixture Proportions	1.2	GA WA													
			SD-07 Certificates															
			Cementitious Materials	1.2	FIO													
			Aggregates	1.2	FIO													
		03600	SD-01 Data															
			Manufacturer's specs and installation instructions for all proprietary materials	1.3	GA WA													
			For ordinary cement grout, copies of grout design mix and laboratory test reports for grout strength tests.	1.3	GA WA													
			For proprietary materials, reports on quality control tests.	1.3	GA WA													
			Certification that materials meet specification requirements for nonproprietary materials.	1.3	FIO													
		04200	SD-01 Data															
			Concrete Masonry Units	1.2	G WA													

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TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION ITEM SUBMITTED	P A R A G R A P H #	G O V T C L A S S I F I C A T I O N A R E T I V E R O W N E R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R A C T O R D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H / A U T H	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			SD-04 Drawings														
			Masonry Work	1.2	G WA												
			SD-13 Certificates														
			Concrete Masonry Units (CMU)	1.2	G WA												
			Control Joint Keys	1.2	G WA												
			Anchors, Ties, and Positioners	1.2	G WA												
			Expansion-Joint Materials	1.2	G WA												
			Joint Reinforcement	1.2	G WA												
			Reinforcing Steel Bars and Rods	1.2	G WA												
			Masonry Cement	1.2	G WA												
			Mortar coloring	1.2	G WA												
			Mortar Admixtures	1.2	G WA												
			Grout Admixtures	1.2	G WA												
			SD-14 Samples														
			Concrete Masonry Units (CMU)	1.2	G WA												
			Anchors, Ties, and Bar Positioners	1.2	G WA												
			Expansion-Joint Material	1.2	G WA												
			Joint Reinforcement	1.2	G WA												

SUBMITTAL REGISTER

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TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION ITEM SUBMITTED	P A R A G R A P H	G O V T C L A S S I F I C A T I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R / D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H / C O N T R	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H R E V I E W E R	C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		05093	SD-02 Shop Drawings														
			Pressure Piping	1.3	G WA												
			SD-03 Product Data														
			Qualifications	1.3	G WA												
			Welding Operations	1.3	FIO												
			SD-07 Certificates														
			Qualifications	1.3	G WA												
		06610	SD-01 Data														
			Load Test Certification	1.3	FIO												
			Structural Design Calculations	1.3	GA WA												
			Manufacturer Apprised Certification	1.3	FIO												
			Manufacturer's Qualifications	1.3	FIO												
			SD-04 Drawings														
			Fabrications and Erection	1.3	GA WA												
			SD-14 Samples														
			Full-Size Post Assembly	1.3	GA WA												
			Ladder Components														
			SD-19 O and M Manuals														
			Owner's Manual	1.3	FIO												

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CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H G #	G O V T C L A S S I F I C A T I O N A R E T I V E I T E M S	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R A C T O R D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H/ D A T E R C D F R O M C O N T R	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H E R R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		06611	SD-01 Data														
			Product Data	1.3	GA WA												
			Experience	1.3	GA WA												
			Field Support	1.3	FIO												
			Manufacturer Color Chart	1.3	GA WA												
			Shop Test Data	1.3	FIO												
			SD-04 Drawings														
			Shop Drawings	1.3	GA WA												
			SD-14 Samples														
			Product Sample	1.3	GA WA												
		07900	SD-03 Data														
			Backing	1.2	G WA												
			Bond-Breaker	1.2	G WA												
			Sealer	1.2	G WA												
			SD-07 Certificates														
			Sealant	1.2	G WA												
		08110	SD-02 Shop Drawings														
			Doors	1.2	G WA												
			Frames	1.2	G WA												
			Accessories	1.2	G WA												
			Weatherstripping	1.2	G WA												

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TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H G #	G O V T C L A S S I F I C A T I O N A R E T I V E R E V I E W E R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R A C T O R D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H	D A T E R C D F R O M C O N T R	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H R E V I E W E R	A C T I O N C O D E		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			SD-03 Product Data														
			Doors	1.2	G WA												
			Frames	1.2	G WA												
			Accessories	1.2	G WA												
			Weatherstripping	1.2	G WA												
			SD-04 Samples														
			Doors and Frame Samples	1.2	G WA												
		08700	SD-02 Shop Drawings														
			Exit Devices	1.2	G WA												
			Drawings	1.2	G WA												
			SD-03 Product Data														
			Exit Device Accessories	1.2	G WA												
			Hardware Schedule	1.2	G WA												
			SD-07 Certificates														
			Hardware and Accessories	1.2	G WA												
		09900	SD-03 Product Data														
			Paint	1.2	GA WA												
			Mixing and Thinning	1.2	FIO												
			Application	1.2	FIO												
			SD-04 Samples														
			Paint	1.2	FIO												

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Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H #	G O V T C L A S S I F I C A T I O N A R E T I V E C O D E	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R A C T O R D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H / A U T H	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H E R R E V I E W E R	C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			SD-06 Test Reports														
			Paint	1.2	GA WA												
			SD-07 Certification														
			Lead	1.2	FIO												
			Mildewcide and Insecticide	1.2	FIO												
			Volatile Organic Content VOC Content	1.2	FIO												
		13281	SD-03 Product Data														
			Materials and Equipment	1.4	GA WA												
			Expendable Supplies	1.4	GA WA												
			Qualifications	1.4	GA WA												
			SD-06 Test Reports														
			Pressure Differential Log	1.4	FIO												
			Licenses, Permits, & Notification	1.4	GA WA												
			Accident Prevention Plan (APP)	1.4	GA WA												
			Sampling and Analysis	1.4	GA WA												
			Clearance Report	1.4	GA WA												
		13621	SD-01 Data														
			Supplier Qualifications	1.6	GA AE												
			Pre-Submittal Conference	1.6	FIO												

SUBMITTAL REGISTER

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TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H #	G O V T C L A S S I F I C A T I O N A R E V I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R / D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H /	D A T E R C D F R O M C O N T R	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H E R R E V I E W E R	A C T I O N C O D E		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			Data														
			WFB-SCADA System Information	1.6	GA AE												
			Panels and Cabinets Information	1.6	GA AE												
			WFB-SCADA System I/O Loop Wiring Diagrams	1.6	GA AE												
		13621	System Software Documentation	1.6	FIO												
			SD-18 Records														
			Record Drawings and Documentation	1.6	FIO												
			SD-19 O and M Manuals														
			WFB-SCADA System O and M Manuals	1.6	GA WA												
		13623	SD-09 Reports														
			Certified Calibration Reports	1.5	FIO												
			Installation Inspection Report	1.5	FIO												
		13624	SD-06 Instructions														
			Training Plan	1.2	GA WA												
		13630	SD-01 Data														
			Distributed Process	1.3	GA WA												

SUBMITTAL REGISTER

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TITLE AND LOCATION						CONTRACTOR												
Dalecarlia Water Treatment Plant – West Filter Controls																		
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H #	G O V T C L A S S I F I C A T I O N A R E V I E W R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY						M A I L E D T O C O N T R / D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H E R R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
			Controllers															
		13631	SD-01 Data															
			Process Taps, Sensing Lines, And Accessories	1.4	GA WA													
			Differential Pressure Transmitters	1.4	GA WA													
			Turbidity Transmitters	1.4	GA WA													
			Single Loop Digital Controller	1.4	GA WA													
		13640	SD-1 Data															
			Panels and Enclosures	1.3	GA WA													
		13641	SD-01 Data															
			Power Supplies	1.4	GA WA													
			Signal Isolator	1.4	GA WA													
			Control Relay	1.4	GA WA													
			Time Delay Relay	1.4	GA WA													
			Selector Switch, Pushbuttons, And Indicator Lights	1.4	GA WA													
			Operator Interface Terminal Hardware	1.4	GA AE													
		13801	SD-01 Data															
			Venturi Meter Inspector	1.3	FIO													
			Rehabilitation Provider	1.3	FIO													
			Venturi Meter Calibrator	1.3	FIO													

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TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H G #	G O V T C L A S S I F I C A T I O N A R E I T E M N O	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R A C T O R D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H / A U T H	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			SD-09 Reports														
			Inspection Report	1.3	FIO												
			Certified Calibration Report	1.3	FIO												
			Installation Certification	1.3	FIO												
		15080	SD-04 Samples														
			Thermal Insulation Materials	1.4	G WA												
		15100	SD-01 Data														
			Pneumatic Actuator Cylinders And Accessories	1.3	GA AE												
			Installation Conformance Certification	1.3	FIO												
			SD-09 Reports														
			Pneumatic Actuator Cylinders And Accessories	1.3	GA AE												
			SD-19 O and M Manuals														
			Pneumatic Actuator Cylinders And Accessories	1.3	GA WA												
		15190	SD-02 Shop Drawings														
			Gas Piping System	1.3	G WA												
			SD-03 Product Data														

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CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H G #	G O V T C L A S S I F I C A T I O N A R E T I V E R E G I S T E R E D	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R A C T O R D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H	D A T E R C D F R O M C O N T R	D A T E F W D T O O T H E R R E V I E W E R	D A T E R C D F R O M O T H E R R E V I E W E R	A C T I O N C O D E		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			Qualifications	1.3	G WA												
			SD-06 Test Reports														
			Testing	1.3	FIO												
			Pressure Tests	1.3	FIO												
			SD-13 Certificates														
			Material Certificates	1.3	FIO												
	15200		SD-02 Shop Drawings														
			Pipe Equipment	1.4	GA WA												
			SD-03 Product Data														
			Welders	1.4	FIO												
			Waste Water Disposal	1.4	FIO												
			Delivery, Storage, and Handling	1.4	FIO												
			Materials and Equipment	1.4	GA WA												
			Installation	1.4	GA WA												
			SD-07 Certificates														
			Plastic Piping System	1.4	FIO												
	15483		SD-01 Data														
			Air Compressor System	1.3	GA WA												
			Refrigerated Air Dryer	1.3	GA WA												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Water Treatment Plant – West Filter Controls																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N I T E M S U B M I T T E D	P A R A G R A P H G #	G O V T C L A S S I F I C A T I O N A R E T I V E R I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					M A I L E D T O C O N T R A C T O R D A T E R C D F R M A P P R A U T H	R E M A R K S
						S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F W D T O A P P R A U T H	D A T E F W D T O O T H R E V I E W E R	D A T E R C D F R O M O T H R E V I E W E R	A C T I O N C O D E	D A T E O F A C T I O N		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
			SD-09 Reports														
			Air Compressor Systems	1.3	GA WA												
			Refrigerated Air Dryers	1.3	GA WA												
			SD-19 O and M Manuals														
			Air Compressor System	1.3	GA WA												
			Refrigerated Air Dryers	1.3	GA WA												
		15501	SD-01 Data														
			Condensate Recovery System	1.3	GA WA												
			SD-04 Drawings														
			Condensate Recovery System	1.3	GA WA												
			SD-06 Test Reports														
			Condensate Recovery System	1.3	GA WA												
			SD-13 Certificates														
			Factory Test Report	1.3	FIO												
			SD-19 O and M Data														
			Condensate Recovery System	1.3	GA WA												

SECTION 01451

CONTRACTOR QUALITY CONTROL
09/98

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 basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740 (1994a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E 329 (1995b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

CQC Plan; GA|WA.

Identifies personnel, procedures, control, instructions, test, records, and forms to be used.

SD-06 Instructions

CQC Plan; GA|WA.

Identifies personnel, procedures, control, instructions, test, records, and forms to be used.

SD-07 Schedules

CQC Plan; GA|WA.

Identifies personnel, procedures, control, instructions, test, records, and

forms to be used.

SD-08 Statements

Change Notification; FIO.

Any changes made by the Contractor.

Phase Notification; FIO.

The Government shall be notified in a specified amount of time in advance of beginning the preparatory control phase.

Punchlist; FIO.

Near the completion of all work, the CQC System Manager shall prepare a list of items which do not conform to the approved drawings and specifications.

SD-09 Reports

CQC Plan; GA|WA.

Identifies personnel, procedures, control, instructions, test, records, and forms to be used..

Request; GA|WA.

The requesting of specialized individuals in specific disciplines to perform quality control.

Tests; FIO.

Specified or required tests shall be done by the Contractor to verify that control measures are adequate.

Test Reports; FIO.

Results of tests taken..

SD-13 Certification

CQC Plan; GA|WA.

Identifies personnel, procedures, control, instructions, test, records, and forms to be used..

CQC Mgr Qualification; GA|WA.

The evaluation of the project to determine the level of CQC System Manager required.

SD-14 Samples

CQC Mgr Qualification; GA|WA.

The evaluation of the project to determine the level of CQC System Manager required.

SD-18 Records

CQC Plan; GA|WA.

Identifies personnel, procedures, control, instructions, test, records, and forms to be used..

Minutes; FIO.

Prepared by the Government and signed by both the Contractor and the Contracting Officer and shall become a part of the contract file.

CQC Mgr Qualification; FIO.

The evaluation of the project to determine the level of CQC System Manager required.

Tests Performed; FIO.

An information copy provided directly to the Contracting Officer.

QC Records; GA|WA.

Provid factual evidence that required quality control activities and/or tests have been performed.

PART 2 PRODUCTS
NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.2 CQC PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 60 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the

particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature

of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 14 calendar days prior to the Coordination Meeting.

During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 General

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, or an experienced construction person, with a minimum of 5 years construction experience on construction similar to this contract. This CQC System Manager shall be on

the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as System Manager but may have duties as project superintendent in addition to quality control. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors" within 45 calendar days after NTP is a mandatory requirement for the position of the Quality Control Systems Manager. Certification is good for five (5) years at which time re-training is required. The Contractor's QC Systems Manager may be appointed and serve fully in that capacity pending certification. If the CQC Systems Manager fails to successfully complete the training, the Contractor should promptly appoint a new CQSM who shall then attend the next available course. The course is nine (9) hours long (1 day). The Construction Quality Management Course (CQMC) will be taught at least nine (9) times per year by the Baltimore District Corps of Engineers, at various locations around Baltimore and Washington, DC, or at another site if conditions warrant. The CQMC cost will be borne by the Contractor and is one hundred and twenty-five dollars (\$125.00) per course, per person. Payment shall be made by check payable to either sponsors of the course: Associated Builders and Contractors, Inc, (ABC) 14120 Park Long Court, Suite 111, Chantilly, Virginia 20151 (Phone: 703-968-6205), or to The Associated General Contractors of America (AGC), Maryland Chapter, 1301 York Road, Heaver Plaza, Suite 202, Lutherville, Maryland 21093 (Phone: 410-321-7870) prior to the start of the course. Reservations to attend the course should be made directly to the organization sponsoring the course they attend. The Contractor has forty-five (45) calendar days to attend the course after the issuance of the NTP. The contractor shall contact the Contracting Officer upon award of the contract for arrangements for the course.

3.4.4 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS

Submittals shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications.
- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. The Government shall be notified at least 72 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 72 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.

- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of \$1,500.00 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Furnishing or Transportation of Samples for Testing: Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the following address:

Field Exploration Unit
or
Soils Laboratory Unit
(indicate which on shipping or mailing forms)
Fort McHenry Yard
Baltimore, Maryland 21230"

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause in Section 00800 of the Solicitation entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a punchlist of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at this inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.

- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals reviewed, with contract reference, by whom, and action taken.
- g. Off-site surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order

stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

04/1998

Contractor's Name: _____
Address: _____
Phone Number: _____

CONSTRUCTION QUALITY CONTROL REPORT

PROJECT NAME: _____
 LOCATION: _____ DATE: _____
 CONTRACT NUMBER: _____ REPORT NO.: _____

SUPERINTENDENT: _____			
TYPE OF WORKERS	NUMBER	TYPES OF CONSTRUCTION EQUIPMENT ON SITE	NUMBER
SUBCONTRACTORS			
COMPANY	RESPONSIBILITY	FOREMAN	NO. OF WORKERS
TOTALS			
NO. OF WORKERS TODAY	MANHOURS TODAY	MANHOURS FOR THIS PERIOD	
CONTRACT MATERIALS AND EQUIPMENT DELIVERED TO SITE:			
WEATHER: _____ SITE CONDITIONS: _____			
DID A DELAY OR WORK STOPPAGE OCCUR TODAY? _____ IF YES, EXPLAIN.			
HAS ANYTHING DEVELOPED IN THE WORK WHICH MAY LEAD TO A CHANGE OR FINDING OF FACT? _____ IF YES, EXPLAIN.			

DESCRIPTION OF ALL WORK PERFORMED TODAY
(LIST BY DEFINABLE FEATURES OF WORK)

PREPARATORY INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION.
ATTACH MINUTES OF MEETING AND LIST OF ALL ATTENDEES.

HAVE ALL REQUIRED SUBMITTALS AND SAMPLES OF CONSTRUCTION BEEN
APPROVED.

DO THE MATERIALS AND EQUIPMENT TO BE USED CONFORM TO THE SUBMITTALS?

HAS ALL PRELIMINARY WORK BEEN INSPECTED, TESTED, AND COMPLETED?

TEST REQUIRED AND INSPECTION TECHNIQUES TO BE EXECUTED TO PROVE
CONTRACT COMPLIANCE (INCLUDE BOTH EXPECTED AND ACTUAL RESULTS)

HAS A PHASE HAZARD ANALYSIS BEEN PERFORMED?

COMMENTS AND DEFICIENCIES NOTED AND CORRECTIVE ACTIONS TAKEN:

ALL INSTRUCTIONS RECEIVED FROM QA PERSONNEL AND ACTIONS TAKEN:

JOB SAFETY (INCLUDE MEETINGS HELD AND DEFICIENCIES NOTED WITH CORRECTIVE ACTIONS):

INITIAL INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION. COMMENTS AND/OR DEFICIENCIES NOTED AND CORRECTIVE ACTION TAKEN:

FOLLOW-UP INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION. COMMENTS AND/OR DEFICIENCIES NOTED AND CORRECTIVE ACTION TAKEN.

SIGNATURE: _____
QUALITY CONTROL REPRESENTATIVE/MANAGER

THE ABOVE REPORT IS COMPLETE AND CORRECT. ALL MATERIALS AND EQUIPMENT USED AND ALL WORK PERFORMED DURING THIS REPORTING PERIOD ARE IN COMPLIANCE WITH THE CONTRACT SPECIFICATIONS, AND SUBMITTALS, EXCEPT AS NOTED ABOVE.

SIGNATURE: _____
CONTRACTOR'S APPROVED AUTHORIZED REPRESENTATIVE

Contractor's Name:	_____
Address:	_____ _____
Phone Number:	_____

CONSTRUCTION QUALITY CONTROL REPORT

PROJECT NAME: _____
 LOCATION: _____ DATE: _____
 CONTRACT NUMBER: _____ REPORT NO.: _____

SUPERINTENDENT: _____			
TYPE OF WORKERS	NUMBER	TYPES OF CONSTRUCTION EQUIPMENT ON SITE	NUMBER
SUBCONTRACTORS			
COMPANY	RESPONSIBILITY	FOREMAN	NO. OF WORKERS
TOTALS			
NO. OF WORKERS TODAY	MANHOURS TODAY	MANHOURS FOR THIS PERIOD	
CONTRACT MATERIALS AND EQUIPMENT DELIVERED TO SITE:			
WEATHER: _____		SITE CONDITIONS: _____	
DID A DELAY OR WORK STOPPAGE OCCUR TODAY? _____ IF YES, EXPLAIN.			
HAS ANYTHING DEVELOPED IN THE WORK WHICH MAY LEAD TO A CHANGE OR FINDING OF FACT? _____ IF YES, EXPLAIN.			

DESCRIPTION OF ALL WORK PERFORMED TODAY
(LIST BY DEFINABLE FEATURES OF WORK)

PREPARATORY INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION.
ATTACH MINUTES OF MEETING AND LIST OF ALL ATTENDEES.

HAVE ALL REQUIRED SUBMITTALS AND SAMPLES OF CONSTRUCTION BEEN
APPROVED.

DO THE MATERIALS AND EQUIPMENT TO BE USED CONFORM TO THE SUBMITTALS?

HAS ALL PRELIMINARY WORK BEEN INSPECTED, TESTED, AND COMPLETED?

TEST REQUIRED AND INSPECTION TECHNIQUES TO BE EXECUTED TO PROVE
CONTRACT COMPLIANCE (INCLUDE BOTH EXPECTED AND ACTUAL RESULTS)

HAS A PHASE HAZARD ANALYSIS BEEN PERFORMED?

COMMENTS AND DEFICIENCIES NOTED AND CORRECTIVE ACTIONS TAKEN:

ALL INSTRUCTIONS RECEIVED FROM QA PERSONNEL AND ACTIONS TAKEN:

JOB SAFETY (INCLUDE MEETINGS HELD AND DEFICIENCIES NOTED WITH CORRECTIVE ACTIONS):

INITIAL INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION.
COMMENTS AND/OR DEFICIENCIES NOTED AND CORRECTIVE ACTION TAKEN:

FOLLOW-UP INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION.
COMMENTS AND/OR DEFICIENCIES NOTED AND CORRECTIVE ACTION TAKEN.

SIGNATURE: _____
QUALITY CONTROL REPRESENTATIVE/MANAGER

THE ABOVE REPORT IS COMPLETE AND CORRECT. ALL MATERIALS AND EQUIPMENT USED AND ALL WORK PERFORMED DURING THIS REPORTING PERIOD ARE IN COMPLIANCE WITH THE CONTRACT SPECIFICATIONS, AND SUBMITTALS, EXCEPT AS NOTED ABOVE.

SIGNATURE: _____
CONTRACTOR'S APPROVED AUTHORIZED REPRESENTATIVE

SECTION 01510

TEMPORARY CONSTRUCTION ITEMS
01/95

PART 1 GENERAL

1.1 General

The work covered by this section consists of furnishing all labor, materials, equipment, and services and performing all work required for or incidental to the items herein specified. No separate payment will be made for the construction and services required by this section, and all costs in connection therewith shall be included in the overall cost of the work unless specifically stated otherwise.

1.2 PROJECT SIGN: (AUG 1974)

A project sign shall be provided and erected at a location designated by the Contracting Officer. The sign shall conform to the requirements as shown on Attachment No. 1, a copy of which is attached hereto. The sign shall be erected as soon as possible and within 15 days after the date of receipt of notice to proceed. Upon completion of the project, the sign shall be removed and disposed of by the Contractor. (CENAB)

1.3 SAFETY SIGN (AUG 1974)

A safety sign shall be provided and erected at a location designated by the Contracting Officer. The sign shall conform to the requirements as shown on Attachment No. 2, a copy of which is attached hereto. The sign shall be erected as soon as possible and within 15 days after the date of receipt of notice to proceed. The data required by the sign shall be corrected daily, with light colored metallic or non-metallic numerals. Numerals, including mounting hardware, shall be subject to the approval of the Contracting Officer. Upon completion of the project, the sign shall be removed and disposed of by the Contractor. (CENAB)

1.4 TEMPORARY ELECTRICAL WORK: (APR 1962)

Interior work which will be visible in the finished project will be executed only under conditions of illumination of an intensity equal to or greater than 20 foot (6 10 m) candles. If the Contractor fails to maintain the required illumination the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop order shall be made subject of claim for extension of time or for excess costs or damages by the Contractor. (CENAB-EN-DT)

1.5 BULLETIN BOARD: (NOV 1983)

Immediately upon beginning of work under this contract, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36 x 48 inches (914.4 mm x 1,219.2 mm) in size, for displaying the Equal Employment Opportunity Poster, a copy of the wage decision contained in the contract, Wage Rate Information Poster, and other information approved by the Contracting Officer. The bulletin board

shall be located at the site of work in a conspicuous place easily accessible to all employees as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work under the contract is complete. Upon completion of work under this contract the bulletin board shall be removed by and remain the property of the Contractor. (AFRCE)

ATTACHMENTS:

Attachment 1 Project Sign

Attachment 2 Safety Sign

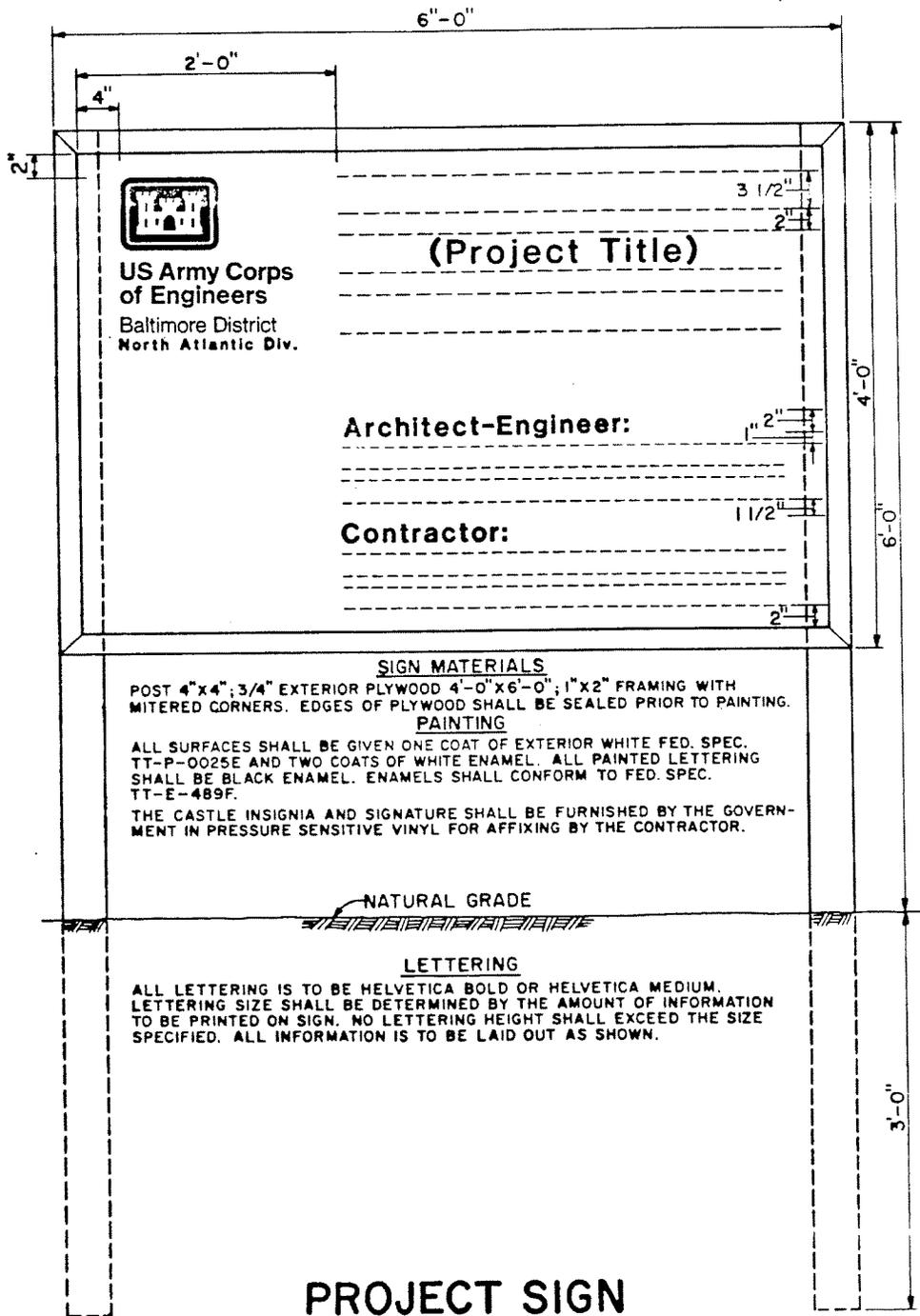
PART 2 PRODUCT

NOT APPLICABLE

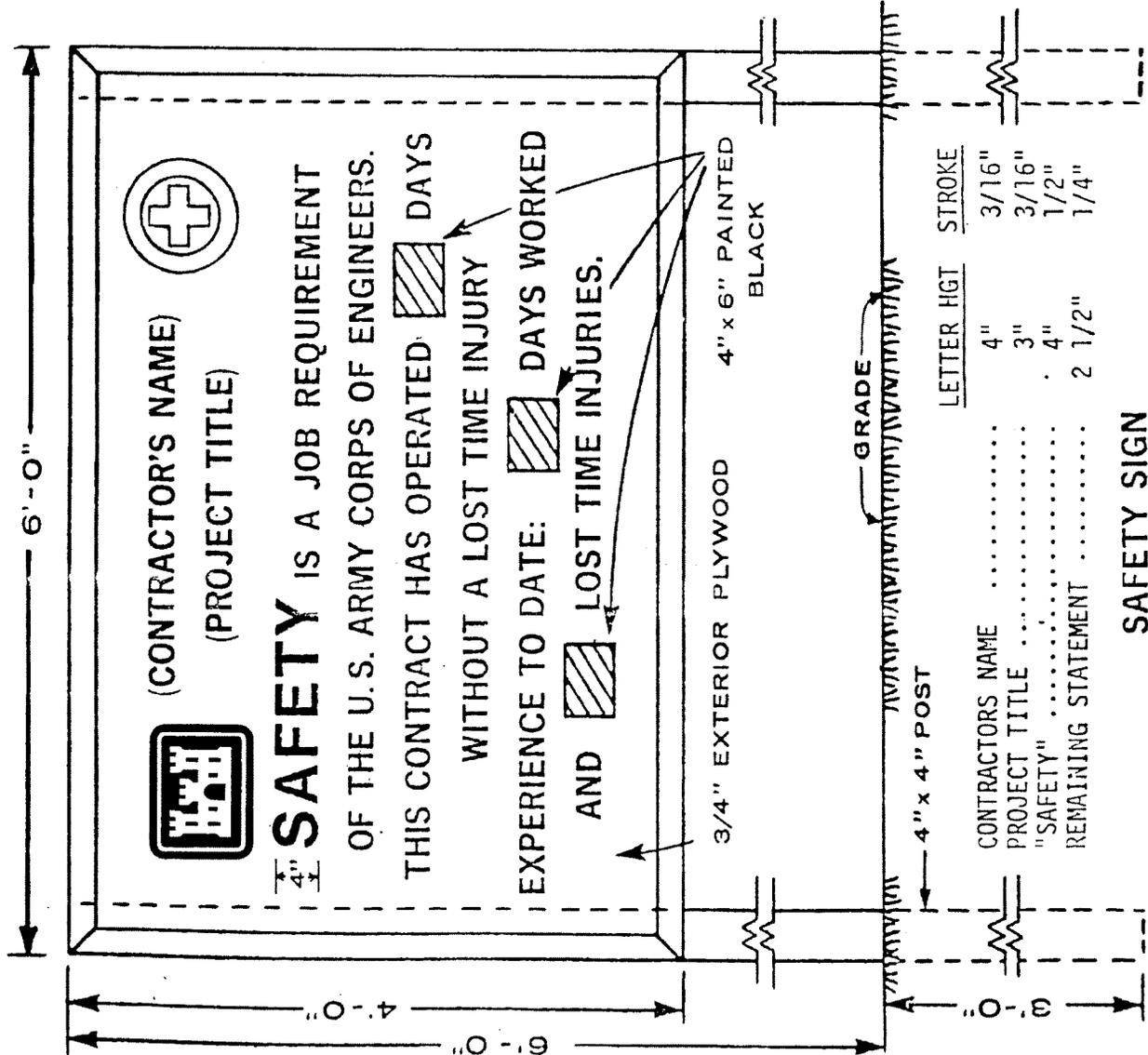
PART 3 EXECUTION

NOT APPLICABLE

-- End of Section --



PROJECT SIGN



SIGN MATERIALS

POST 4"x4"; 3/4" EXTERIOR PLYWOOD 4' - 0" x 6' - 0", 2" x 2" FRAMING WITH MITERED CORNERS. FRAMING ENCLOSED EDGES OF PLYWOOD AND BE INSTALLED FLUSH ON BACK SIDE AND PROJECTING IN FRONT. OUTSIDE WHITE, HOUSE PAINT-2 COATS; BOTH SIDES AND EDGES; COLORS IN OIL FOR LETTERING - LAMP BLACK AND BULLETIN RED; CASTLE SHALL BE RED; LETTERING SHALL BE BLACK; THE CROSS SHALL BE GREEN

THE CASTLE INSIGNIA SHALL BE FURNISHED BY THE GOVERNMENT IN PRESSURE SENSITIVE VINYL FOR AFFIXING BY THE CONTRACTOR.

SECTION 01562

ENVIRONMENTAL PROTECTION
01/01

PART 1 GENERAL

The work covered by this section consists of furnishing all labor, materials and equipment and performing all work required for the prevention of environmental pollution during and as the result of construction operations under this contract except for those measures set forth in other Technical Provisions of these specifications. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importances to human life or affect other species of importance to man. The control of environmental pollution requires consideration of air, water, and land.

1.1 APPLICABLE REGULATIONS

In order to prevent, and to provide for abatement and control of any environmental pollution arising from construction activities, the Contractor and his subcontractors in the performance of this contract, shall comply with all applicable Federal, State, and local laws, and regulations concerning environmental pollution control and abatement, and all applicable provisions of the Corps of Engineers Manual, EM 385-1-1, entitled "Safety and Health Requirements Manual" in effect on the date of solicitation as well as the specific requirements stated elsewhere in the contract specifications.

1.2 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 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Implementation; G AR.

Contractor's proposal to put into practice the environmental pollution control.

1.3 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any non-compliance with the foregoing provisions and the action to be taken.

The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient notification for the purpose. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it was later determined that the Contractor was in compliance.

1.4 SUBCONTRACTORS

Compliance with the provisions of this section by subcontractors will be the responsibility of the Contractor.

1.5 IMPLEMENTATION

Prior to commencement of the work the Contractor will:

1.5.1 Approval

Submit in writing, for approval, his proposals for implementing this section for environmental pollution control;

1.5.2 Environmental Pollution Control

Meet with the representatives of the Contracting Officer to develop mutual understanding relative to compliance with this provision and administration of the environmental pollution control program.

1.6 PROTECTION OF WATER RESOURCES

The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acid construction wastes or other harmful materials. It is the responsibility of the Contractor to investigate and comply with all applicable Federal, State, County and Municipal laws concerning pollution of rivers and streams. All work under this contract shall be performed in such a manner that objectionable conditions will not be created in streams through or adjacent to the project areas.

1.7 BURNING

Unless otherwise specified in other sections of the specifications, burning will be allowed only if authorized in writing by the Contracting Officer. However, the specific time, location and manner of burning shall be subject to the approval of the Contracting Officer. Fires shall be guarded at all times and shall be under constant surveillance until they have burned out or have been extinguished. All burning shall be so thorough that the materials will be reduced to ashes.

1.8 DUST CONTROL

The Contractor shall maintain all work areas free from dust which would contribute to air pollution. Approved temporary methods of stabilization consisting of sprinkling, chemical treatment, light bituminous treatment or similar methods will be permitted to control dust. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

1.9 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

During the life of this contract, the Contractor shall maintain all facilities constructed for pollution control under this contract as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

1.10 MEASUREMENT AND PAYMENT

Except as noted in paragraph, PERFORMANCE AND PAYMENT BOND REIMBURSEMENT above, no separate measurement and payment will be made for the work performed in this Section 01562 ENVIRONMENTAL PROTECTION specified herein and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor, and shall be included in the overall cost of the work.

PART 2 PRODUCT
NOT APPLICABLE

PART 3 EXECUTION
NOT APPLICABLE

-- End of Section --

SECTION 01720

AS-BUILT DRAWINGS - CADD
10/97

PART 1 GENERAL

1.1 Preparation

This section covers the preparation of as-built drawings complete, as a requirement of this contract. The terms "drawings," "contract drawings," "drawing files," and "final as-built drawings" refer to a set of computer-aided design and drafting (CADD) contract drawings in electronic file format which are to be used for as-built drawings.

1.2 PROGRESS MARKED UP AS-BUILT PRINTS

The Contractor shall revise one set of paper prints to show the as-built conditions during the prosecution of the project. These as-built marked prints shall be kept current and available on the jobsite at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. The as-built marked prints will be jointly reviewed for accuracy and completeness by the Contracting Officer and a responsible representative of the construction Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings and will continue the monthly deduction of the 10% retainage even after 50% completion of the contract. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and a representative of the Contractor regarding the accuracy and completeness of updated drawings. The prints shall show the following information, but not be limited thereto:

1.2.1 Location and Description

The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.

1.2.2 Location and Dimensions

The location and dimensions of any changes within the building or structure.

1.2.3 Corrections

Correct grade, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

Correct elevations if changes were made in site grading.

1.2.4 Changes

Changes in details of design or additional information obtained from

working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

All changes or modifications which result from the final inspection.

1.2.5 Options

Where contract drawings or specifications present options, only the option selected for construction shall be shown on the as-built prints.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

CADD Files; FIO.

Shall consist of two sets of completed as-built contract drawings on separate media consisting of both CADD files (compatible with the Using Agency/Sponsor's system on electronic storage media identical to that supplied by the Government) and mylars.

SD-04 Drawings

Progress Prints; GA|WA.

Preparation of two copies of as-builts from the Contractor to the Contracting Officer for review and approval.

Final Prints; GA|WA.

Receipt by the Contractor of the approved marked as-built prints.

1.4 PRELIMINARY SUBMITTAL

At the time of final inspection, the Contractor shall prepare two copies of the progress as-built prints and these shall be delivered to the Contracting Officer for review and approval. These as-built marked prints shall be neat, legible and accurate. The review by Government personnel will be expedited to the maximum extent possible. Upon approval, one copy of the as-built marked prints will be returned to the Contractor for use in preparation of final as-built drawings. If upon review, the as-built marked prints are found to contain errors and/or omissions, they shall be returned to the Contractor for corrections. The Contractor shall complete the corrections and return the as-built marked prints to the Contracting Officer within ten (10) calendar days.

1.5 DRAWING PREPARATION

1.5.1 As-Built Drawings Approval

Upon approval of the as-built prints submitted, the Contractor will be furnished by the Government one set of contract drawings, with all

amendments incorporated, to be used for as-built drawings. These contract drawings will be furnished on CD-ROM. These drawings shall be modified as may be necessary to correctly show all the features of the project as it has been constructed by bringing the contract set into agreement with the approved as-built prints, adding such additional drawings as may be necessary. These drawings are part of the permanent records of this project and the Contractor shall be responsible for the protection and safety thereof until returned to the Contracting Officer. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.5.2 Proficient Personnel

Only personnel proficient in the preparation of engineering CADD drawings to standards satisfactory and acceptable to the Government shall be employed to modify the contract drawings or prepare additional new drawings. All additions and corrections to the contract drawings shall be equal in quality to that of the originals. Line work, line weights, lettering, layering conventions, and symbols shall be the same as the original line work, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same guidance specified for original drawings. The title block and drawing border to be used for any new as-built drawings shall be identical to that used on the contract drawings. All additions and corrections to the contract drawings shall be accomplished using CADD media files supplied by the Government. These contract drawings will already be compatible with the Using Agency/Sponsor's system when received by the Contractor. The Using Agency/Sponsor uses AutoCAD 2000 CADD software system. The media files will be supplied on ISO 9660 Format CD-ROM. The Contractor is responsible for providing all program files and hardware necessary to prepare as-built drawings. The Contracting Officer will review all as-built drawings for accuracy and the Contractor shall make all required corrections, changes, additions, and deletions.

1.5.3 Final Revisions

When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the General Contractor in letters at least 3/16" (5 mm) high. All other contract drawings shall be marked either "As-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. All original contract drawings shall be dated in the revision block (SEE ATTACHMENT 1) located at the end of this section.

1.6 FINAL REQUIREMENTS

After receipt by the Contractor of the approved marked as-built prints and the original contract drawing files the Contractor will, within 30 days for contracts less than \$5 million or 60 days for contracts \$5 million and above, make the final as-built submittal. The submittal shall consist of the following:

a) Two sets of the as-built contract drawings on separate CD's (ISO 9660 Format CD-ROM) consisting of the updated CADD files and a CALS Type 1 Group 4 Raster Image File of each contract drawing plate. The CALS files shall be exact duplicates of the full sized plots of the completed as-built contract drawings at a resolution of 400dpi and may be either plotted to CALS files directly from the CADD files, or scanned to file from the prints.

b) Two sets of full size paper prints (plots) of the completed as-built contract drawings.

c) The return of the approved marked as-built prints.

They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any translations or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with its CADD system. All paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit as-built drawing files and marked prints as required herein shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.7 PAYMENT

No separate payment will be made for the as-built drawings required under this contract, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor.

PART 2 PRODUCT
NOT APPLICABLE

PART 3 EXECUTION
NOT APPLICABLE

-- End of Section --

RECORD DRAWING AS-BUILT
 XYZ CONTRACTOR

Plate: 1
 Sheet Number: T-1

FT. INDIANTOWN GAP PENNSYLVANIA
 EQUIPMENT CONCENTRATION SITE
 COVER SHEET

U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND	Designed by:		Date: JAN 2001	Rev.
	Dwn by:	Ckd by:	Design file no.	
A/E FIRM/CONTRACTOR 3 LINES PROVIDED OR LOGO	Reviewed by:		Drawing Number: F-XXX-XX-XX	
	Submitted by: Chief, Branch		File name: FILENAME Plot date: 12/25/00 Plot scale: 1=1	

Mark	Description	Date	Appr.	Mark	Description	Date	Appr.
	AS-BUILT	10 SEP 02					
3	REVISED SECTION A-A AND C-C	5 JAN 01	A.E. D.P.				
2	REVISED PER AMENDMENT NO. 2	30 DEC 00	A.E. D.P.				
1	REVISED PER AMENDMENT NO. 1	25 DEC 00	A.E. D.P.				

SECTION 02120

TRANSPORTATION AND DISPOSAL OF HAZARDOUS MATERIALS
10/96

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 basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
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 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
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 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

49 CFR 107	Hazardous Materials Program Procedures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 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 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

On-site Hazardous Waste Management; G|WA

Prior to start of work, a plan detailing the manner in which hazardous wastes shall be managed.

Notices of Non-Compliance and Notices of Violation, FIO

Notices of non-compliance or notices of violation by a Federal, state, or local regulatory agency issued to the Contractor in relation to any work performed under this contract. The Contractor shall immediately provide copies of such notices to the Contracting Officer's Representative. The Contractor shall also furnish all relevant documents regarding the incident and any information requested by the Contracting Officer's Representative, and shall coordinate its response to the notice with the Contracting Officer's Representative or his designated representative prior to submission to the notifying authority. The Contractor shall also furnish a copy to the Contracting Officer's Representative of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

SD-07 Certificates

Shipping Documents and Packagings Certification; G|WA

All transportation related shipping documents to the Contracting Officer's Representative, including draft hazardous waste manifests, draft bill of lading for hazardous materials, lists of corresponding proposed labels, packages, marks, and placards to be used for shipment, for review a minimum of 14 days prior to anticipated pickup. Packaging assurances shall be furnished prior to transporting hazardous material; bill of lading shall be furnished when shipments are originated; and "receipt copies" of asbestos waste shipment records at the designated disposal facility shall be furnished not later than 35 days after acceptance of the shipment.

1.3 QUALIFICATIONS

1.3.1 Transportation and Disposal Coordinator

The Contractor shall designate, by position and title, one person to act as the Transportation and Disposal Coordinator (TDC) for this contract. The TDC shall serve as the single point of contact for all environmental regulatory matters and shall have overall responsibility for total environmental compliance at the site including, but not limited to, accurate identification and classification of hazardous waste and hazardous materials; determination of proper shipping names; identification of marking, labeling, packaging and placarding requirements; completion of waste profiles, hazardous waste manifests, asbestos waste shipment records, PCB manifests, bill of lading, exception and discrepancy reports; and all other environmental documentation. The TDC shall have, at a minimum, one year of specialized experience in the management and transportation of hazardous waste.

1.3.2 Training

The Contractor's employees transporting hazardous materials or preparing hazardous materials for transportation shall be trained, tested, and certified in accordance with 49 CFR 172.

1.3.3 Certification

The Contractor and/or subcontractors transporting hazardous materials shall possess a current certificate of registration issued by the Research and Special Programs Administration (RSPA), U.S. Department of Transportation, when required by 49 CFR 107, Subpart G.

1.4 LAWS AND REGULATIONS REQUIREMENTS

Work shall meet or exceed the minimum requirements established by Federal, state, and local laws and regulations which are applicable. These requirements are amended frequently and the Contractor shall be responsible for complying with amendments as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, the Contractor shall notify the Contracting Officer's Representative immediately.

1.5 DEFINITIONS

- a. Hazardous Material. A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to the Hazardous Materials Transportation Act, 49 U.S.C. Appendix Section 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172, Sections .101 and .102 and materials which meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA designated hazardous wastes are also hazardous materials.
- b. Hazardous Waste. A waste which meets criteria established in RCRA or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.

PART 2 PRODUCTS

2.1 MATERIALS

The Contractor shall provide all of the materials required for the packaging, labeling, marking, placarding and transportation of hazardous wastes and hazardous materials in conformance with Department of Transportation standards. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

2.1.1 Packagings

The Contractor shall provide bulk and non-bulk containers for packaging hazardous materials/wastes consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 8. Bulk and non-bulk packaging shall meet the corresponding specifications in 49 CFR 173 referenced in the Hazardous Materials Table, 49 CFR 172, Section .101. Each packaging shall conform to the general packaging requirements of Subpart B of 49 CFR 173, to the requirements of 49 CFR 178 at the specified packing group performance level, to the requirements of special provisions of column 7 of the Hazardous Materials Table in 49 CFR 172, Section .101, and shall be compatible with the material to be packaged as required by 40 CFR 262. The Contractor shall also provide other packaging related materials such as materials used to cushion or fill voids in overpacked containers, etc. Sorbent materials shall not be capable of reacting dangerously with, being decomposed by, or being ignited by the hazardous materials being packaged. Additionally, sorbents used to treat free liquids to be disposed of in landfills shall be non-biodegradable as specified in 40 CFR 264, Section .314.

2.1.2 Markings

The Contractor shall provide markings for each hazardous material/waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D and 40 CFR 262, Section .32 (for hazardous waste). Markings shall be capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.3 Labeling

The Contractor shall provide primary and subsidiary labels for hazardous materials/wastes consistent with the requirements in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 6. Labels shall meet design specifications required by 49 CFR 172, Subpart E including size, shape, color, printing, and symbol requirements. Labels shall be durable and weather resistant and capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.4 Placards

For each off-site shipment of hazardous material/waste, the Contractor shall provide primary and subsidiary placards consistent with the requirements of 49 CFR 172, Subpart F. Placards shall be provided for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without

deterioration, a 30 day exposure to open weather conditions and shall meet design requirements specified in 49 CFR 172, Subpart F.

2.1.5 Spill Response Materials

The Contractor shall provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials shall be available at all times in which hazardous materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of material being handled.

2.2 EQUIPMENT AND TOOLS

The Contractor shall provide miscellaneous equipment and tools necessary to handle hazardous materials and hazardous wastes in a safe and environmentally sound manner.

PART 3 EXECUTION

3.1 ON-SITE HAZARDOUS WASTE MANAGEMENT

These paragraphs apply to Government owned waste only. Contractors are prohibited by 10 U.S.C. 2692 from storing contractor owned waste on site for any length of time. The Contractor shall be responsible for ensuring compliance with all Federal, state, and local hazardous waste laws and regulations and shall verify those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents. The Contractor shall identify hazardous wastes using criteria set forth in 40 CFR 261 or all applicable state and local laws, regulations, and ordinances. When accumulating hazardous waste on-site, the Contractor shall comply with generator requirements in 40 CFR 262 and any applicable state or local law or regulations. On-site accumulation times for this facility shall be 90 days. Accumulation start dates shall commence when waste is first generated (i.e. containerized or otherwise collected for discard). The Contractor shall only use containers in good condition and compatible with the waste to be stored. The Contractor shall be responsible for ensuring containers are closed except when adding or removing waste. The Contractor shall be responsible for immediately marking all hazardous waste containers with the words "hazardous waste" and other information required by 40 CFR 262, Section .32 and any applicable state or local law or regulation as soon as the waste is containerized. An additional marking shall be placed on containers of "unknowns" designating the date sampled, and the suspected hazard. The Contractor shall be responsible for inspecting containers for signs of deterioration and shall be responsible for responding to any spills or leaks. The Contractor shall inspect all hazardous waste areas weekly and shall provide written documentation of the inspection. Inspection logs shall contain date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken.

3.1.1 Hazardous Waste Classification

The Contractor, in consultation with the Contracting Officer's Representative, shall identify all waste codes applicable to each hazardous waste stream based on requirements in 40 CFR 261 or any applicable state or local law or regulation. The Contractor shall also identify all applicable treatment standards in 40 CFR 268 and state land disposal restrictions and shall make a determination as to whether or not the waste meets or exceeds

the standards. Waste profiles, analyses, classification and treatment standards information shall be submitted to Contracting Officer's Representative for review and approval.

3.1.2 Management Plan

The Contractor shall prepare a plan detailing the manner in which hazardous wastes will be managed and describing the types and volumes of hazardous wastes anticipated to be managed as well as the management practices to be utilized. The plan shall identify the method to be used to ensure accurate piece counts and/or weights of shipments; shall identify waste minimization methods; shall propose facilities to be utilized for treatment, storage, and/or disposal; shall identify areas on-site where hazardous wastes are to be handled; shall identify whether transfer facilities are to be utilized; and if so, how the wastes will be tracked to ultimate disposal.

3.2 OFF-SITE HAZARDOUS WASTE MANAGEMENT

The Contractor shall use RCRA Subtitle C permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265. Off-site treatment, storage, and/or disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into ground water, surface water, soil, or air) shall not be used.

3.2.1 Description of TSD Facility and Transporter

The Contractor shall provide the Contracting Officer's Representative with EPA ID numbers, names, locations, and telephone numbers of TSD facilities and transporters. This information shall be contained in the Hazardous Waste Management Plan for approval prior to waste disposal.

3.2.2 Status of the Facility

Facilities receiving hazardous waste must be permitted in accordance with 40 CFR 270 or operating under interim status in accordance with 40 CFR 265 requirements, or must be permitted by an authorized state program. Additionally, prior to using a TSD Facility, the Contractor shall contact the EPA Regional Off-site Coordinator specified in 40 CFR 300, Section .440, to determine the facility's status, and document all information necessary to satisfy the requirements of the EPA Off-Site policy and furnish this information to the Contracting Officer's Representative.

3.2.3 Shipping Documents and Packagings Certification

Prior to shipment of any hazardous material off-site, the Contractor's TDC shall provide written certification to the Contracting Officer's Representative that hazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements.

3.2.4 Transportation

The Contractor shall use manifests for transporting hazardous wastes as required by 40 CFR 263 or any applicable state or local law or regulation. Transportation shall comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series. The Contractor shall acquire manifests in accordance with the hierarchy established in 40 CFR 262, Section .21. The Contractor shall prepare hazardous waste

manifests for each shipment of hazardous waste shipped off-site. Manifests shall be completed using instructions in 40 CFR 262, Subpart B and any applicable state or local law or regulation. Manifests and waste profiles shall be submitted to Contracting Officer's Representative for review and approval. The Contractor shall prepare land disposal restriction notifications as required by 40 CFR 268 or any applicable state or local law or regulation for each shipment of hazardous waste. Notifications shall be submitted with the manifest to the Contracting Officer's Representative for review and approval. When the additional cost of sending a qualified USACE representative to a remote location for a small clean up project is unwarranted, the option of requiring the on-site Contractor to sign the manifests on behalf of the generator is permitted and should be considered. This option shall only be exercised on a project specific basis, if prior to the solicitation process, written authorization of the customer and approval of the Chief, Construction Division at the executing district has been obtained, and the technical provisions of the contract solicitation provide competing contractors notice of the requirement.

3.2.5 Treatment and Disposal of Hazardous Wastes

The hazardous waste shall be transported to an approved hazardous waste treatment, storage, or disposal facility within 90 days of the accumulation start date on each container. The Contractor shall ship hazardous wastes only to facilities which are properly permitted to accept the hazardous waste or operating under interim status. The Contractor shall ensure wastes are treated to meet land disposal treatment standards in 40 CFR 268 prior to land disposal. The Contractor shall propose TSD facilities via submission of the Hazardous Waste Management Plan, subject to the approval of the Contracting Officer's Representative.

3.3 HAZARDOUS MATERIALS MANAGEMENT

The Contractor, in consultation with the Contracting Officer's Representative, shall evaluate, prior to shipment of any material off-site, whether the material is regulated as a hazardous waste in addition to being regulated as a hazardous material; this shall be done for the purpose of determining proper shipping descriptions, marking requirements, etc., as described below.

3.3.1 Identification of Proper Shipping Names

The Contractor shall use 49 CFR 172, Section .101 to identify proper shipping names for each hazardous material (including hazardous wastes) to be shipped off-site. Proper shipping names shall be submitted to the Contracting Officer's Representative in the form of draft shipping documents for review and approval.

3.3.2 Packaging, Labeling, and Marking

The Contractor shall package, label, and mark hazardous materials/wastes using the specified materials and in accordance with the referenced authorizations. The Contractor shall mark each container of hazardous waste of 104 gallons or less with the following:

"HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal.
If found, contact the nearest police or public safety authority or the U.S.
Environmental Protection Agency.
Generator's name _____

Manifest Document Number _____".

3.3.3 Shipping Documents

The Contractor shall ensure that each shipment of hazardous material sent off-site is accompanied by properly completed shipping documents.

3.3.3.1 Other Hazardous Material Shipment Documents

The Contractor shall prepare a bill of lading for each shipment of hazardous material which is not accompanied by a hazardous waste manifest or asbestos waste shipment record which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C, and any applicable state or local law or regulation, and shall be submitted to the Contracting Officer's Representative for review and approval. For laboratory samples and treatability study samples, the Contractor shall prepare bills of lading and other documentation as necessary to satisfy conditions of the sample exclusions in 40 CFR 261, Section .4(d) and (e) and any applicable state or local law or regulation. Bill of ladings requiring shipper's certifications shall be signed by the Government.

3.4 OBTAINING EPA ID NUMBERS

The Contracting Officer's Representative will provide an EPA ID number upon request.

3.5 WASTE MINIMIZATION

The Contractor shall minimize the generation of hazardous waste to the maximum extent practicable. The Contractor shall take all necessary precautions to avoid mixing clean and contaminated wastes. The Contractor shall identify and evaluate recycling and reclamation options as alternatives to land disposal.

3.6 RECORDKEEPING

The Contractor shall be responsible for maintaining adequate records to support information provided to the Contracting Officer's Representative regarding exception reports, annual reports, and biennial reports. The Contractor shall be responsible for maintaining asbestos waste shipment records for a minimum of 3 years from the date of shipment or any longer period required by any applicable law or regulation or any other provision of this contract.

3.7 SPILL RESPONSE

The Contractor shall respond to any spill of hazardous material or hazardous waste which are in the custody or care of the Contractor, pursuant to this contract. Any direction from the Contracting Officer's Representative concerning a spill or release shall not be considered a change under the contract. The Contractor shall comply with all applicable requirements of Federal, state, or local laws or regulations regarding any spill incident.

3.8 EMERGENCY CONTACTS

The Contractor shall be responsible for complying with the emergency contact provisions in 49 CFR 172, Section .604. Whenever the Contractor

ships hazardous materials, the Contractor shall provide a 24 hr emergency response contact and phone number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information. The phone must be monitored on a 24 hour basis at all times when the hazardous materials are in transportation, including during storage incidental to transportation. The Contractor shall ensure that information regarding this emergency contact and phone number are placed on all hazardous material shipping documents. The Contractor shall designate an emergency coordinator and post the following information at areas in which hazardous wastes are managed:

- a. The name of the emergency coordinator.
- b. Phone number through which the emergency coordinator can be contacted on a 24 hour basis.
- c. The telephone number of the local fire department.
- d. The location of fire extinguishers and spill control materials.

Attachment A
SAMPLE OFF-SITE POLICY CERTIFICATION MEMO

Project/Contract #: _____
Waste Stream: _____
Primary TSD Facility, EPA ID # and Location: _____
Alter. TSD Facility, EPA ID # and Location: _____

EPA Region	Primary Contact	Secondary Contact
I	(617) 565-9446	(617) 573-1754
II	(212) 637-4139	(212) 264-2638
III	(814) 566-3450	(215) 597-8338
IV	(404) 562-8589	(404) 347-7603
V	(312) 886-3587	(312) 886-4445
VI	(214) 665-2282	(214) 655-2281
VII	(913) 551-7883	(913) 551-7667
VIII	(303) 312-6419	(303) 293-1506
IX	(415) 744-2091	(415) 744-2114
X	(206) 553-1061	(206) 553-1061

EPA representative contacted: _____
EPA representative phone number: _____
Date contacted: _____

Comment: _____
The above EPA representative was contacted on _____. As of that date the above sites were considered acceptable in accordance with the Off-Site Policy in 40 CFR 300.440.

Signature: _____ Date: _____
Phone number: _____

-- End of Section --

SECTION 02220

DEMOLITION

12/97

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 basic designation only.

ENGINEERING MANUALS (EM)

EM 385-1-1 (1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2 GENERAL REQUIREMENTS

The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections. In the interest of conservation, salvage shall be pursued to the maximum extent possible; salvaged items and materials shall be disposed of as specified.

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 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Work Plan; G|WA

The procedures proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations in accordance with EM 385-1-1.

1.4 DUST CONTROL

The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.

1.5 PROTECTION

1.5.1 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element 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.

1.5.2 Protection of Structures

Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, shall remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the Contracting Officer. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.3 Protection of Existing Property

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.4 Protection From the Weather

The interior of buildings to remain; salvageable materials and equipment shall be protected from the weather at all times.

1.5.5 Environmental Protection

The work shall comply with the requirements of Section 01561 ENVIRONMENTAL PROTECTION.

1.6 BURNING

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

1.7 USE OF EXPLOSIVES

Use of explosives will not be permitted.

1.8 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be as indicated on the Drawings and in the Specifications.

PART 2 PRODUCTS
NOT APPLICABLE

PART 3 EXECUTION

3.1 EXISTING STRUCTURES

Existing structures indicated shall be removed as shown on the Drawings.

3.2 UTILITIES

Existing utilities shall be removed as indicated. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area.

3.3 DISPOSITION OF MATERIAL

Title to material and equipment to be demolished, except Government salvage and historical items, is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.3.1 Salvageable Items and Material

Contractor shall salvage items and material to the maximum extent possible.

3.3.1.1 Material Salvaged for the Contractor

Material salvaged for the Contractor shall be stored as approved by the Contracting Officer and shall be removed from Government property before completion of the contract. Material salvaged for the Contractor shall not be sold on the site.

3.3.2 Unsalvageable Material

Concrete, masonry, and other noncombustible material, except concrete permitted to remain in place, shall be disposed of in the disposal area located off the site in accordance with all federal, state, and local laws and ordinances, as may be applicable. Combustible material shall be disposed of in a permitted sanitary fill area located off the site.

3.4 CLEAN UP

Debris and rubbish shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations

regarding hauling and disposal shall apply.

-- End of Section --

SECTION 03252

CONCRETE ANCHORS

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 Scope

1.1.1.1 Contractor shall provide all labor, materials, equipment and incidentals as shown, specified, and required to furnish and install anchor bolts, expansion anchors, and adhesive anchors.

1.1.1.2 This Section includes all bolts and anchors required for the Work but not specified under other Sections.

1.1.1.3 The types of work using concrete anchors includes but is not limited to the following:

- a. Hangers and brackets.
- b. Equipment.
- c. Piping.
- d. FRP platform.
- e. FRP ladders.
- f. Electrical work.

1.1.2 Related Divisions and Sections:

1.1.2.1 Division 1, General Requirements.

1.1.2.2 Division 6, Wood and Plastics.

1.1.2.3 Division 15, Mechanical.

1.1.2.4 Division 16, Electrical.

1.2 QUALITY ASSURANCE

1.2.1 Reference Standards:

Comply with the applicable provisions and recommendations of the following, except as otherwise shown and specified.

1.2.1.1 ASTM A 36, Standard Specification for Structural Steel.

1.2.1.2 ASTM A 123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

1.2.1.3 ASTM A 153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

- 1.2.1.4 ASTM A 276, Standard Specification for Stainless Steel Bars and Shapes.
 - 1.2.1.5 ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 1.2.1.6 ASTM A 320, Standard Specification for Alloys - Steel Bolting Materials for Low-Temperature Service.
 - 1.2.1.7 ASTM A 484, Standard Specification for General Requirements for Stainless and Heat-Resisting Steel Bars, Billets and Forgings.
 - 1.2.1.8 ASTM A 525, Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - 1.2.1.9 ASTM A 536, Standard Specification for Ductile Iron Castings.
 - 1.2.1.10 ASTM A 570, Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.
 - 1.2.1.11 ASTM B 633, Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
 - 1.2.1.12 ASTM F 594, Standard Specification for Stainless Steel Nuts.
 - 1.2.1.13 Federal Specification FF-S-325 for Concrete Expansion Anchors.
 - 1.2.1.14 Federal Specifications WW-H-171E for Malleable Iron.
- 1.2.2 Expansion anchors and inserts shall be UL or FM approved.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Anchor Bolts; GA|WA.

Wedge Expansion Anchors; GA|WA.

Adhesive Anchors; GA|WA.

Manufacturer's descriptive data and technical literature which demonstrates compliance with applicable specifications and requirements.

Data shall also include manufacturer's installation instructions and load tables.

PART 2 PRODUCTS

2.1 DESIGN CRITERIA

2.1.1 General

When the size, length or load carrying capacity of an anchor bolt or expansion anchor is not shown, provide the size, length and capacity required to carry the design load times a minimum safety factor of four.

2.1.2 Determine design loads as follows:

2.1.2.1 For equipment anchors, use the design load recommended by the manufacturer and approved by Contracting Officer.

2.1.2.2 For pipe hangers and supports, use one half the total weight of pipe, fittings, valves, accessories and water contained in pipe, between the hanger or support in question and adjacent hangers and supports on both sides.

2.1.2.3 Allowances for vibration are included in the safety factor specified above.

2.1.2.4 Anchors shall develop ultimate shear and pull-out loads of not less than the following values in concrete:

<u>Bolt Diameter</u> <u>(Inches)</u>	<u>Min Shear</u> <u>(Pounds)</u>	<u>Min Pull-Out Load</u> <u>(Pounds)</u>
1/2	4,500	6,300
5/8	6,900	7,700
3/4	10,500	9,900

2.2 MATERIALS

2.2.1 Anchor Bolts:

2.2.1.1 Provide stainless steel bolts complying with ASTM A 320, AISI Type 316, non-headed type unless otherwise indicated.

2.2.1.2 In buried or submerged locations, provide stainless steel bolts complete with nuts and washers complying with ASTM A 320, AISI Type 316. Other AISI types may be used subject to Contracting Officer's approval.

2.2.1.3 For equipment provide anchor bolts which meet the equipment manufacturer's recommendations for size, material, and strength.

2.2.1.4 Provide anchor bolts as shown or as required to secure structural steel to concrete or masonry.

2.2.1.5 Locate and accurately set the anchor bolts using templates or other devices as necessary.

2.2.1.6 Protect threads and shank from damage during installation of equipment and structural steel.

2.2.1.7 Comply with required embedment length and necessary anchor bolt projections

2.2.2 Wedge Expansion Anchors:

2.2.2.1 Provide stainless steel wedge expansion anchors, nuts and washers complying with 276 or F 594 and AISI Type 316.

2.2.2.2 Product and Manufacturer: Provide one of the following:

- a. Hilti Kwik Bolt, as manufactured by Hilti, Incorporated.
- b. Trubolt Wedge, as manufactured by ITW Ramset/Red Head, Incorporated.
- c. Or equal.

2.2.3 Adhesive Anchors:

2.2.3.1 Anchors shall be rod or rebar type as indicated on drawings.

- a. Provide stainless steel rod anchors complying with ASTM A 320, AISI Type 316.
- b. Provide rebar anchors complying with ASTM A615, Grade 60.

2.2.3.2 Anchors shall be of the size indicated on the drawings or as recommended by manufacturer.

2.2.3.3 Adhesive anchors shall consist of threaded rods or bolts anchored with an adhesive system into hardened concrete or grout-filled masonry. The adhesive system shall use a two-component adhesive mix and shall be injected with a static mixing nozzle following manufacturer's instructions. The embedment depth of the rod/bolt shall provide a minimum allowable bond strength that is equal to the allowable tensile capacity of the rod/bolt, unless noted otherwise on the Drawings.

2.2.3.4 Product and Manufacturer: Provide one of the following:

- a. HIT HY-150 Injection Adhesive Anchor System, as manufactured by Hilti, Incorporated.
- b. Or equal.

PART 3 EXECUTION

3.1 INSPECTION

Contractor shall examine areas and conditions under which anchor bolts and expansion anchors Work is to be installed, and notify Contracting Officer in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected in a manner acceptable to Contracting Officer.

3.2 INSTALLATION

3.2.1 Manufacturer's Instructions:

Drilling equipment used and installation of expansion anchors shall be in accordance with manufacturer's instructions.

3.2.2 Embedded Items:

Assure that embedded items are protected from damage and are not filled in with concrete.

3.2.3 Expansion Anchors:

3.2.3.1 Expansion anchors may be used for hanging or supporting pipe 2

inches diameter and smaller. Expansion anchors shall not be used for larger pipe unless otherwise shown or approved by Contracting Officer.

3.2.3.2 Unless otherwise shown or approved by Contracting Officer, conform to the following:

- a. Minimum embedment depth in concrete: 5 diameters.
- b. Minimum anchor spacing on centers: 10 diameters.
- c. Minimum distance to edge of concrete: 5 diameters.
- d. Increase dimensions above if required to develop the required anchor load capacity.

3.2.4 Adhesive Anchors:

3.2.4.1 For the adhesive anchors and adhesive material, Contractor shall comply with the manufacturer's installation instructions on the hole diameter and depth required to fully develop the tensile strength of the anchor rod or reinforcing bar. Contractor shall properly clean out the hole utilizing a wire brush and compressed air to remove all loose material from the hole, prior to installing adhesive material.

3.2.4.2 Adhesive anchor system manufacturer's representative shall observe and demonstrate the proper installation procedures for the adhesive anchors system at no additional expense to Contracting Officer. Each installer shall be certified in writing by the manufacturer to be qualified to install the adhesive anchors.

3.3 CLEANING

After embedding concrete is placed, remove protection and clean bolts.

3.4 FIELD QUALITY CONTROL

3.4.1 Field Quality Control Requirements:

3.4.1.1 Contractor shall employ a testing laboratory to perform field quality testing of installed anchors. Contracting Officer is to determine the level of testing which is required for the various types of expansion anchors and bolts. A minimum of ten percent of the adhesive anchors are to be tested to 1/3 of the ultimate tensile capacity of the anchor.

3.4.1.2 If failure of any of the adhesive rod anchors occur, Contractor will be required to pay for the costs involved in testing the remaining ninety percent.

3.4.1.3 Contractor shall correct improper workmanship, remove and replace, or correct as instructed, all anchors found unacceptable or deficient.

3.4.1.4 Contractor shall pay for all corrections and subsequent tests required to confirm the integrity of the anchor.

3.4.1.5 The independent testing and inspection agency shall complete a report on each area. The report should summarize the observations made by the inspector and be submitted to Contracting Officer.

3.4.1.6 Provide access for the testing agency to places where work is being produced so that required inspection and testing can be accomplished.

-- End of Section --

SECTION 03307

CONCRETE FOR MINOR STRUCTURES
12/92

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 basic designation only.

ACI INTERNATIONAL (ACI)

ACI 308	(1992; R 1997) Standard Practice for Curing Concrete
ACI 318/318R	(1999) Building Code Requirements for Structural Concrete and Commentary
ACI 318M	(1995) Metric Building Code Requirements for Structural Concrete and Commentary
ACI 347R	(1994) Guide to Formwork for Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 185	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 615/A 615M	(1996ael) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C 31/C 31M	(1998) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1999ael) Concrete Aggregates
ASTM C 39/C 39M	(1999) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 94/C 94M	(2000) Ready-Mixed Concrete
ASTM C 143/C 143M	(1998) Slump of Hydraulic Cement Concrete
ASTM C 150	(1999a) Portland Cement
ASTM C 171	(1997a) Sheet Materials for Curing Concrete
ASTM C 172	(1999) Sampling Freshly Mixed Concrete
ASTM C 231	(1997el) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(1998) Air-Entraining Admixtures for Concrete

ASTM C 309	(1998a) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 494/C 494M	(1999a) Chemical Admixtures for Concrete
ASTM C 595	(1998) Blended Hydraulic Cements
ASTM C 595M	(1997) Blended Hydraulic Cements (Metric)
ASTM C 618	(1999) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 685	(1998a) Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C 920	(1998) Elastomeric Joint Sealants
ASTM D 75	(1987; R 1997) Sampling Aggregates
ASTM D 98	(1998) Calcium Chloride
ASTM D 1752	(1984; R 1996e1) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM E 96	(1995) Water Vapor Transmission of Materials

CORPS OF ENGINEERS (COE)

COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete
COE CRD-C 572	(1974) Corps of Engineers Specifications for Polyvinylchloride Waterstop

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having a "FIO" 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 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Air-Entraining Admixture; G|WA
[Accelerating Admixture]; G|WA
Water-Reducing or Retarding Admixture; G|WA
Curing Materials; G|WA
[Reinforcing Steel]; G|WA

Provide Manufacturer's literature which demonstrates compliance with applicable specifications for the above materials.

Batching and Mixing Equipment; FIO

Batching and mixing equipment will be accepted on the basis of manufacturer's data which demonstrates compliance with the applicable specifications.

Conveying and Placing Concrete; FIO

The methods and equipment for transporting, handling, depositing, and consolidating the concrete shall be submitted prior to the first concrete placement.

Formwork; FIO

Formwork design shall be submitted prior to the first concrete placement.

SD-06 Test Reports

Aggregates; G|WA

Aggregates will be accepted on the basis of certificates of compliance and test reports that show the material(s) meets the quality and grading requirements of the specifications under which it is furnished.

Concrete Mixture Proportions; G|WA

Ten days prior to placement of concrete, the contractor shall submit the mixture proportions that will produce concrete of the quality required. Applicable test reports shall be submitted to verify that the concrete mixture proportions selected will produce concrete of the quality specified.

SD-07 Certificates

Cementitious Materials; FIO

Certificates of compliance attesting that the concrete materials meet the requirements of the specifications shall be submitted in accordance with the Special Clause "CERTIFICATES OF COMPLIANCE". Cementitious material will be accepted on the basis of a manufacturer's certificate of compliance, accompanied by mill test reports that the material(s) meet the requirements of the specification under which it is furnished.

Aggregates; FIO

Aggregates will be accepted on the basis of certificates of compliance and tests reports that show the material(s) meet the quality and grading requirements of the specifications under which it is furnished.

1.3 DESIGN AND PERFORMANCE REQUIREMENTS

The Government will maintain the option to sample and test [joint sealer, joint filler material, waterstop,] aggregates and concrete to determine compliance with the specifications. The Contractor shall provide facilities and labor as may be necessary to assist the Government in procurement of representative test samples. Samples of aggregates will be

obtained at the point of batching in accordance with ASTM D 75. Concrete will be sampled in accordance with ASTM C 172. Slump and air content will be determined in accordance with ASTM C 143/C 143M and ASTM C 231, respectively, when cylinders are molded. Compression test specimens will be made, cured, and transported in accordance with ASTM C 31/C 31M. Compression test specimens will be tested in accordance with ASTM C 39/C 39M.

Samples for strength tests will be taken not less than once each shift in which concrete is produced [from each class of concrete required]. A minimum of three specimens will be made from each sample; two will be tested at 28 days (90 days if pozzolan is used) for acceptance, and one will be tested at 7 days for information.

1.3.1 Strength

Acceptance test results will be the average strengths of two specimens tested at 28 days (90 days if pozzolan is used). The strength of the concrete will be considered satisfactory so long as the average of three consecutive acceptance test results equal or exceed the specified compressive strength, f'c, and no individual acceptance test result falls below f'c by more than 500 psi.

1.3.2 Concrete Mixture Proportions

Concrete mixture proportions shall be the responsibility of the Contractor.

Mixture proportions shall include the dry weights of cementitious material(s); the nominal maximum size of the coarse aggregate; the specific gravities, absorptions, and saturated surface-dry weights of fine and coarse aggregates; the quantities, types, and names of admixtures; and quantity of water per cubic yard of concrete. All materials included in the mixture proportions shall be of the same type and from the same source as will be used on the project. Specified compressive strength f'c shall be 3,000 psi at 28 days (90 days if pozzolan is used). The maximum nominal size coarse aggregate shall be 3/4 inch, in accordance with ACI 318/318R. The air content shall be between 4.5 and 7.5 percent. The slump shall be between 2 and 5 inches. The maximum water cement ratio shall be 0.45.

1.4 REGULATORY REQUIREMENTS

The [state statutory and regulatory requirements] [_____] listed below form a part of this specification to the extent referenced.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cementitious Materials

Cementitious materials shall conform to the appropriate specifications listed:

2.1.1.1 Portland Cement

ASTM C 150, Type II.

2.1.1.2 Pozzolan

Pozzolan shall conform to ASTM C 618, Class F.

2.1.2 Aggregates

Aggregates shall meet the quality and grading requirements of ASTM C 33 Class Designations 4M or better.

2.1.3 Admixtures

Admixtures to be used, when required or approved, shall comply with the appropriate specification listed. Chemical admixtures that have been in storage at the project site for longer than 6 months or that have been subjected to freezing shall be retested at the expense of the contractor at the request of the Contracting Officer and shall be rejected if test results are not satisfactory.

2.1.3.1 Air-Entraining Admixture

Air-entraining admixture shall meet the requirements of ASTM C 260.

2.1.3.2 Accelerating Admixture

Accelerators shall meet the requirements of ASTM C 494/C 494M, Type C or E.

2.1.3.3 Water-Reducing or Retarding Admixture

Water-reducing or retarding admixture shall meet the requirements of ASTM C 494/C 494M, Type A, B, or D. [High-range water reducing admixture Type F may be used only when approved, approval being contingent upon particular placement requirements as described in the Contractor's Quality Control Plan.]

2.1.4 Water

Water for mixing and curing shall be fresh, clean, potable, and free from injurious amounts of oil, acid, salt, or alkali.

2.1.5 Reinforcing Steel

Reinforcing steel bar shall conform to the requirements of ASTM A 615/A 615M, Grade 60. Welded steel wire fabric shall conform to the requirements of ASTM A 185. Details of reinforcement not shown shall be in accordance with ACI 318/318R, Chapters 7 and 12.

2.1.6 Formwork

The design and engineering of the formwork as well as its construction, shall be the responsibility of the Contractor.

2.1.7 Form Coatings

Forms for exposed surfaces shall be coated with a nonstaining form oil, which shall be applied shortly before concrete is placed.

2.1.8 Curing Materials

Curing materials shall conform to the following requirements.

2.1.8.1 Impervious Sheet Materials

Impervious sheet materials, ASTM C 171, type optional, except polyethylene film, if used, shall be white opaque.

2.1.1.8.2 Membrane-Forming Curing Compound

ASTM C 309, Type 1-D or 2, Class A.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 General

Construction joints shall be prepared to expose coarse aggregate, and the surface shall be clean, damp, and free of laitance. Ramps and walkways, as necessary, shall be constructed to allow safe and expeditious access for concrete and workmen. Snow, ice, standing or flowing water, loose particles, debris, and foreign matter shall have been removed. Earth foundations shall be satisfactorily compacted. Spare vibrators shall be available. The entire preparation shall be accepted by the Government prior to placing.

3.1.2 Embedded Items

Reinforcement shall be secured in place; joints, anchors, and other embedded items shall have been positioned. Internal ties shall be arranged so that when the forms are removed all metal will be not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structures. Embedded items shall be free of oil and other foreign matters such as loose coatings or rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed. All equipment needed to place, consolidate, protect, and cure the concrete shall be at the placement site and in good operating condition.

3.1.3 Formwork Installation

Forms shall be properly aligned, adequately supported, and mortar-tight. The form surfaces shall be smooth and free from irregularities, dents, sags, or holes when used for permanently exposed faces. All exposed joints and edges shall be chamfered, unless otherwise indicated.

3.1.4 Production of Concrete

3.1.4.1 Ready-Mixed Concrete

Ready-mixed concrete shall conform to ASTM C 94/C 94M except as otherwise specified.

3.1.4.2 Concrete Made by Volumetric Batching and Continuous Mixing

Concrete made by volumetric batching and continuous mixing shall conform to ASTM C 685.

3.1.4.3 Batching and Mixing Equipment

The contractor shall have the option of using an on-site batching and mixing facility. The facility shall provide sufficient batching and mixing equipment capacity to prevent cold joints. The method of measuring materials, batching operation, and mixer shall be submitted for review. [On-site plant shall conform to the requirements of either ASTM C 94/C 94M

or ASTM C 685.]

3.2 CONVEYING AND PLACING CONCRETE

Conveying and placing concrete shall conform to the following requirements.

3.2.1 General

Concrete placement shall not be permitted when weather conditions prevent proper placement and consolidation without approval. When concrete is mixed and/or transported by a truck mixer, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours [or 45 minutes when the placing temperature is 85 degrees F or greater unless a retarding admixture is used]. Concrete shall be conveyed from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. Concrete shall be in place and consolidated within 15 minutes after discharge from the mixer. Concrete shall be deposited as close as possible to its final position in the forms and be so regulated that it may be effectively consolidated in horizontal layers 18 inches or less in thickness with a minimum of lateral movement. The placement shall be carried on at such a rate that the formation of cold joints will be prevented.

3.2.2 Consolidation

Each layer of concrete shall be consolidated by internal vibrating equipment. Internal vibration shall be systematically accomplished by inserting the vibrator through the fresh concrete in the layer below at a uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1.5 times the radius of action of the vibrator and overlay the adjacent, just-vibrated area by a few inches. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the layer below, if such a layer exists. It shall be held stationary until the concrete is consolidated and then withdrawn slowly at the rate of about 3 inches per second.

3.2.3 Cold-Weather Requirements

No concrete placement shall be made when the ambient temperature is below 35 degrees F or if the ambient temperature is below 40 degrees F and falling. Suitable covering and other means as approved shall be provided for maintaining the concrete at a temperature of at least 50 degrees F for not less than 72 hours after placing and at a temperature above freezing for the remainder of the curing period. Salt, chemicals, or other foreign materials shall not be mixed with the concrete to prevent freezing. Any concrete damaged by freezing shall be removed and replaced at the expense of the contractor.

3.2.4 Hot-Weather Requirements

When the rate of evaporation of surface moisture, as determined by use of Figure 1 of ACI 308, is expected to exceed 0.2 pound per square foot per hour, provisions for windbreaks, shading, fog spraying, or covering with a light-colored material shall be made in advance of placement, and such protective measures shall be taken as quickly as finishing operations will allow.

3.3 FORM REMOVAL

Forms shall not be removed before the expiration of 24 hours after concrete placement except where otherwise specifically authorized. Supporting forms and shoring shall not be removed until the concrete has cured for at least 5 days. When conditions on the work are such as to justify the requirement, forms will be required to remain in place for longer periods.

3.4 FINISHING

3.4.1 General

No finishing or repair will be done when either the concrete or the ambient temperature is below 50 degrees F.

3.4.2 Finishing Formed Surfaces

All fins and loose materials shall be removed, and surface defects including tie holes shall be filled. All honeycomb areas and other defects shall be repaired. All unsound concrete shall be removed from areas to be repaired. Surface defects greater than 1/2 inch in diameter and holes left by removal of tie rods in all surfaces not to receive additional concrete shall be reamed or chipped and filled with dry-pack mortar. The prepared area shall be brush-coated with an approved epoxy resin or latex bonding compound or with a neat cement grout after dampening and filled with mortar or concrete. The cement used in mortar or concrete for repairs to all surfaces permanently exposed to view shall be a blend of portland cement and white cement so that the final color when cured will be the same as adjacent concrete.

3.4.3 Finishing Unformed Surfaces

All unformed surfaces that are not to be covered by additional concrete or backfill shall be float finished to elevations shown, unless otherwise specified. Surfaces to receive additional concrete or backfill shall be brought to the elevations shown and left as a true and regular surface. Exterior surfaces shall be sloped for drainage unless otherwise shown. Joints shall be carefully made with a jointing tool. Unformed surfaces shall be finished to a tolerance of 3/8 inch for a float finish [and 5/16 inch for a trowel finish] as determined by a 10 foot straightedge placed on surfaces shown on the plans to be level or having a constant slope. Finishing shall not be performed while there is excess moisture or bleeding water on the surface. No water or cement shall be added to the surface during finishing.

3.4.3.1 Float Finish

Surfaces to be float finished shall be screeded and darbied or bullfloated to eliminate the ridges and to fill in the voids left by the screed. In addition, the darby or bullfloat shall fill all surface voids and only slightly embed the coarse aggregate below the surface of the fresh concrete. When the water sheen disappears and the concrete will support a person's weight without deep imprint, floating should be completed. Floating should embed large aggregates just beneath the surface, remove slight imperfections, humps, and voids to produce a plane surface, compact the concrete, and consolidate mortar at the surface.

3.5 CURING AND PROTECTION

Beginning immediately after placement and continuing for at least 7 days, all concrete shall be cured and protected from premature drying, extremes in temperature, rapid temperature change, freezing, mechanical damage, and exposure to rain or flowing water. All materials and equipment needed for adequate curing and protection shall be available and at the site of the placement prior to the start of concrete placement. Preservation of moisture for concrete surfaces not in contact with forms shall be accomplished by one of the following methods:

- a. Continuous sprinkling or ponding.
- b. Application of absorptive mats or fabrics kept continuously wet.
- c. Application of sand kept continuously wet.
- d. Application of impervious sheet material conforming to ASTM C 171.
- e. Application of membrane-forming curing compound conforming to ASTM C 309, Type 1-D, on surfaces permanently exposed to view and Type 2 on other surfaces shall be accomplished in accordance with manufacturer's instructions.

The preservation of moisture for concrete surfaces placed against wooden forms shall be accomplished by keeping the forms continuously wet for 7 days [, except for concrete made with Type III cement, 3 days]. If forms are removed prior to end of the required curing period, other curing methods shall be used for the balance of the curing period. During the period of protection removal, the temperature of the air in contact with the concrete shall not be allowed to drop more than 25 degrees F within a 24 hour period.

3.6 TESTS AND INSPECTIONS

3.6.1 General

The individuals who sample and test concrete as required in this specification shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

3.6.2 Inspection Details and Frequency of Testing

3.6.2.1 Preparations for Placing

Foundation or construction joints, forms, and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor to certify that it is ready to receive concrete.

3.6.2.2 Air Content

Air content shall be checked at least once during each shift that concrete is placed. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 231.

3.6.2.3 Slump

Slump shall be checked once during each shift that concrete is produced. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 143/C 143M.

3.6.2.4 Consolidation and Protection

The Contractor shall ensure that the concrete is properly consolidated, finished, protected, and cured.

3.6.3 Action Required

3.6.3.1 Placing

The placing foreman shall not permit placing to begin until he has verified that an adequate number of acceptable vibrators, which are in working order and have competent operators, are available. Placing shall not be continued if any pile is inadequately consolidated.

3.6.3.2 Air Content

Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment shall be made to the dosage of the air-entrainment admixture.

3.6.3.3 Slump

Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment should be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the water-cement ratio does not exceed that specified in the submitted concrete mixture proportion.

3.6.4 Reports

The results of all tests and inspections conducted at the project site shall be reported informally at the end of each shift and in writing weekly and shall be delivered within 3 days after the end of each weekly reporting period. See Section 01451 CONTRACTOR QUALITY CONTROL.

-- End of Section --

SECTION 03600

GROUT

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 Scope:

1.1.1.1 CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified and required to furnish and install grout.

1.1.1.2 Grout shall be placed at the following locations:

- a. Column bearing.
- b. Equipment bases.
- c. Masonry work.

1.1.1.3 The types of grout include the following:

- a. Non-shrink, epoxy type.
- b. Non-shrink, non-metallic type.
- c. Ordinary cement-sand type.

1.1.2 Classes of Ordinary Cement Type Grout:

1.1.2.1 Class "B" ordinary cement type grout shall have a compression strength of 3000 PSI and shall be used in the following:

- a. Masonry lintels, bond beams, reinforced masonry cells, and pilasters.

1.1.3 Related Sections:

1.1.3.1 Section 06611, Fiberglass Reinforced Plastic Grating and Structural Shapes.

1.1.3.2 Section 04200, Masonry.

1.2 QUALITY CONTROL

1.2.1 Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

1.2.1.1 ASTM C 144, Standard Specification for Aggregate for Masonry Mortar.

1.2.1.2 ASTM C 150, Standard Specification for Portland Cement.

1.2.1.3 ASTM C 109, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2-in. or 50 mm. Cube Specimens).

1.2.1.4 CRD-C-619, Specification for Grout Fluidifier.

1.2.1.5 CRD-C-621, Specification for Non-Shrink Grout.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Manufacturer's specifications and installation instructions for all proprietary materials. GA|WA

For ordinary cement grout, copies of grout design mix and laboratory test reports for grout strength tests. GA|WA

For proprietary materials, submit copies of reports on quality control tests. GA|WA

Submit certification that materials meet specification requirements for nonproprietary materials. FIO

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

1.4.1 Delivery of Materials: Grout materials from manufacturers shall be delivered in unopened containers and shall bear intact manufacturer's labels.

1.4.2 Storage of Materials: Grout materials shall be stored in a dry shelter and shall be protected from moisture.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Nonmetallic, 100 percent solids, high strength epoxy grout.

2.1.1.1 Use prepackaged, solvent-free, moisture insensitive, high strength epoxy grout.

2.1.1.2 Product and Manufacturer: Provide one of the following:

- a. Euco High Strength Grout, as manufactured by The Euclid Chemical Company.
- b. Sikadur 42 Grout Pak, as manufactured by Sika Corporation.
- c. Five Star Epoxy Grout by Five Star Products, Incorporated.
- d. Or equal.

2.1.2 Nonshrink, Nonmetallic Grout:

2.1.2.1 Prepackaged non-staining cementitious grout which shall meet the minimum requirements of CRD C-621 and requiring only the addition of water at the jobsite.

2.1.2.2 Product and Manufacturer: Provide one of the following:

- a. Euco N-S, as manufactured by The Euclid Chemical Company.
- b. Masterflow 928, as manufactured by Master Builders, Incorporated.
- c. Sika Grout 212, as manufactured by Sika Corporation.

d. Or equal.

2.1.3 Ordinary Cement-Sand Grout: Prepare design mixes of ordinary cement grout. Mixes subject to the following limitations:

2.1.3.1 Cement:

a. Portland cement, ASTM C150, Type II; or blended hydraulic cement, ASTM C595, Type 1P.

2.1.3.2 Aggregates: ASTM C33 and as herein specified.

a. Do not use aggregates containing soluble salts or other substances such as iron sulfides, pyrite, marcasite, ochre, or other materials that can cause stains on exposed concrete surfaces.

b. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances.

1) Dune sand, bank run sand and manufactured sand are not acceptable.

c. Coarse Aggregate: Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:

1) Crushed stone, processed from natural rock or stone.

2) Washed gravel, either natural or crushed. Use of slag and pit or bank run gravel is not permitted.

3) Coarse Aggregate Size: Size to be ASTM C33, No. 7 for Class "B" grout.

2.1.3.3 Admixtures: Provide admixtures produced by established reputable manufacturers, and use in compliance with the manufacturer's printed instruction. Do not use admixtures, which have not been incorporated and tested in the accepted mixes, unless otherwise authorized in writing by Contracting Officer.

2.1.3.4 Proportioning and Design of Mixes: Prepare design mixes for each class of grout. Mixes subject to the following limitations:

a. Class "B" Grout:

1) Specified 28-day Compressive Strength: 3,000 psi.

2) Maximum Water-Cement Ratio by Weight: 0.50.

3) Fine and Coarse Aggregate (No. 7) meeting ASTM C33.

4) Air Content Percentage: 7±1%.

5) Minimum Cement Content in Pounds per Cubic Yard: 611.

2.1.3.5 Use an independent testing company acceptable to Contracting Officer for preparing and reporting proposed mix designs.

a. The testing company shall not be the same as used for field quality control testing unless approved by Contracting Officer.

2.1.3.6 Proportion mixes by either laboratory trial batch or field experience methods, using materials to be employed on the Project for grout required. Comply with ACI 211.1 and report to Contracting Officer the following data:

- a. Complete identification of aggregate source of supply.
- b. Tests of aggregates for compliance with specified requirements.
- c. Scale weight of each aggregate.
- d. Absorbed water in each aggregate.
- e. Brand, type and composition of cement.
- f. Brand, type and amount of each admixture.
- g. Amounts of water used in trial mixes.
- h. Proportions of each material per cubic yard.
- i. Gross weight and yield per cubic yard of trial mixtures.
- j. Measured slump.
- k. Measured air content.
- l. Compressive strength developed at 7 days and 28 days, from not less than 3 test specimens cast for each 7-day and 28-day test, and for each design mix.

2.1.3.7 Submit written reports to Contracting Officer of proposed mix of grout at least 30 days prior to start of Work. Do not begin grout production until mixes have been approved by Contracting Officer.

2.1.3.8 Laboratory Trial Batches: When laboratory trial batches are used to select grout proportions, prepare test specimens and conduct strength tests as specified by ACI.

2.1.3.9 Field Experience Method: When field experience methods are used to select grout proportions, establish proportions as specified by ACI.

2.1.3.10 Admixtures: Use air-entraining admixture in all grout. Provide not less than 4-1/2 percent nor more than 7-1/2 percent entrained air. Use amounts of admixtures as recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control. Do not use admixtures which have not been incorporated and tested in the accepted design mix, unless otherwise authorized in writing by Contracting Officer.

2.1.3.11 Slump Limits: Proportion and design mixes to result in grout slump at the point of placement of not more than 5 inches.

2.1.4 Water:

2.1.4.1 Use clean, fresh, potable water free from injurious amounts of oils, acids, alkalies or organic matter.

PART 3 EXECUTION

3.1 INSPECTION

3.1.1 CONTRACTOR and his installer shall examine the substrate and conditions under which grout is to be placed, and notify Contracting Officer in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to Contracting Officer.

3.2 INSTALLATION

3.2.1 General:

3.2.1.1 Place grout as shown and in accordance with manufacturer's instructions. If manufacturer's instructions conflict with the Specifications do not proceed until Contracting Officer provides clarification.

3.2.1.2 Drypacking will not be permitted.

3.2.1.3 Manufacturers of proprietary products shall make available upon 72 hours notification the services of a qualified, full time employee to aid in assuring proper use of the product under job conditions.

3.2.2 Columns and Equipment Bases:

3.2.2.1 After shimming columns and equipment to proper grade, securely tighten anchor bolts. Properly form around the base plates allowing sufficient room around the edges for placing the grout. Adequate depth between the bottom of the base plate and the top of concrete base must be provided to assure that the void is completely filled with the non-shrink, non-metallic grout.

3.2.3 Grout Fill Around Reinforcement in Masonry Work:

3.2.3.1 Provide ordinary Class "B" cement grout for grout fill around all reinforcement in masonry Work. Site mixing of grout is acceptable. Use of water-reducing admixture not required.

-- END OF SECTION --

SECTION 04200

MASONRY
07/92

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 basic designation only.

ACI INTERNATIONAL (ACI)

ACI SP-66 (1994) ACI Detailing Manual

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 82 (1997a) Steel Wire, Plain, for Concrete Reinforcement

ASTM A 153/A 153M (1998) Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A 615/A 615M (1996ael) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

ASTM C 91 (1999) Masonry Cement

ASTM C 129 (1999a) Nonloadbearing Concrete Masonry Units

ASTM C 140 (1999b) Sampling and Testing Concrete Masonry Units

ASTM C 270 (1999b) Mortar for Unit Masonry

ASTM C 476 (1999) Grout for Masonry

ASTM C 494/C 494M (1999a) Chemical Admixtures for Concrete

ASTM C 641 (1982; R 1998el) Staining Materials in Lightweight Concrete Aggregates

ASTM C 780 (1996el) Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry

ASTM C 1019 (1989a; R 1999) Sampling and Testing Grout

ASTM C 1072 (1999) Measurement of Masonry Flexural Bond Strength

ASTM D 2240 (1997el) Rubber Property - Durometer Hardness

ASTM D 2287	(1996a) Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
ASTM E 119	(1998) Fire Tests of Building Construction and Materials
ASTM E 447	(1997) Compressive Strength of Masonry Prisms

1.2 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 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Concrete Masonry Units; G|WA.

Manufacturer's descriptive data.

SD-04 Drawings

Masonry Work; G|WA.

Drawings including plans, elevations, and details of wall reinforcement; details of reinforcing bars at corners and wall intersections; offsets; tops, bottoms, and ends of walls; control and expansion joints; and wall openings. Bar splice locations shall be shown. Bent bars shall be identified on a bending diagram and shall be referenced and located on the drawings. Wall dimensions, bar clearances, and wall openings greater than one masonry unit in area shall be shown. No approval will be given to the shop drawings until the Contractor certifies that all openings, including those for mechanical and electrical service, are shown. If, during construction, additional masonry openings are required, the approved shop drawings shall be resubmitted with the additional openings shown along with the proposed changes. Location of these additional openings shall be clearly highlighted. The minimum scale for wall elevations shall be 1/4 inch per foot. Reinforcement bending details shall conform to the requirements of ACI SP-66.

SD-13 Certificates

Concrete Masonry Units (CMU); G|WA Control Joint Keys; G|WA Anchors, Ties, and Bar Positioners; G|WA Expansion-Joint Materials; G|WA Joint Reinforcement; G|WA Reinforcing Steel Bars and Rods; G|WA Masonry Cement; G|WA Mortar Coloring; G|WA Mortar Admixtures; G|WA Grout Admixtures; G|WA.

Certificates of compliance stating that the materials meet the specified requirements.

SD-14 Samples

Concrete Masonry Units (CMU); G|WA.

Anchors, Ties, and Bar Positioners; G|WA.

Two of each type used.

Expansion-Joint Material; G|WA.

One piece of each type used.

Joint Reinforcement; G|WA.

One piece of each type used, including corner and wall intersection pieces, showing at least two cross wires.

1.3 RELATED SECTIONS

1.3.1 Section 03600, Grout

1.4 DELIVERY, HANDLING, AND STORAGE

Materials shall be delivered, handled, stored, and protected to avoid chipping, breakage, and contact with soil or contaminating material.

1.4.1 Masonry Units

Concrete masonry units shall be covered or protected from inclement weather and shall conform to the moisture content as specified in ASTM C 90 when delivered to the jobsite. Prefabricated lintels shall be marked on top sides to show either the lintel schedule number or the number and size of top and bottom bars.

1.4.2 Reinforcement, Anchors, and Ties

Steel reinforcing bars, coated anchors, ties, and joint reinforcement shall be stored above the ground. Steel reinforcing bars and uncoated ties shall be free of loose mill scale and rust.

1.4.3 Cementitious Materials, Sand and Aggregates

Cementitious and other packaged materials shall be delivered in unopened containers, plainly marked and labeled with manufacturers' names and brands. Cementitious material shall be stored in dry, weathertight enclosures or be completely covered. Cement shall be handled in a manner that will prevent the inclusion of foreign materials and damage by water or dampness. Sand and aggregates shall be stored in a manner to prevent contamination or segregation.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

The source of materials which will affect the appearance of the finished work shall not be changed after the work has started except with Contracting Officer's approval.

- a. Mortar joint widths shall be maintained as specified.
- b. Rebars shall not be cut, bent or eliminated to fit into the inch-pound CMU products module.

c. Inch-pound CMU products shall not be reduced in size by more than one-third (1/3) in height and one-half (1/2) in length. Cut CMU products shall not be located at ends of walls, corners, and other openings.

d. Cut CMU products shall be held to a minimum and located where they would have the least impact on the architectural aesthetic goals of the facility.

2.2 CONCRETE MASONRY UNITS (CMU)

Hollow and solid concrete masonry units shall conform to ASTM C 90, Type I. Cement shall have a low alkali content and be of one brand.

2.2.1 Aggregates

Lightweight aggregates and blends of lightweight and heavier aggregates in proportions used in producing the units, shall comply with the following requirements when tested for stain-producing iron compounds in accordance with ASTM C 641: by visual classification method, the iron stain deposited on the filter paper shall not exceed the "light stain" classification.

2.2.2 Kinds and Shapes

Units shall be modular in size and shall include closer, jamb, header, lintel, and bond beam units and special shapes and sizes to complete the work as indicated. In exposed interior masonry surfaces, units having a bullnose shall be used for vertical external corners except at door, window, and louver jambs. Radius of the bullnose shall be 1 inch. Units used in exposed masonry surfaces in any one building shall have a uniform fine to medium texture and a uniform color.

2.3 MORTAR

Mortar shall be Type S in accordance with the proportion specification of ASTM C 270 except Type S cement-lime mortar proportions shall be 1 part cement, 1/2 part lime and 4-1/2 parts aggregate; when masonry cement ASTM C 91 is used the maximum air content shall be limited to 12 percent and performance equal to cement-lime mortar shall be verified. Verification of masonry cement performance shall be based on ASTM C 780 and ASTM C 1072. Cement shall have a low alkali content and be of one brand. Aggregates shall be from one source.

2.3.1 Admixtures

In cold weather, a non-chloride based accelerating admixture may be used subject to approval. Accelerating admixture shall be non-corrosive, shall contain less than 0.2 percent chlorides, and shall conform to ASTM C 494/C 494M, Type C.

2.4 GROUT

Grout shall conform to ASTM C 476. Cement used in grout shall have a low alkali content. Grout slump shall be between 8 and 10 inches. Grout shall be used subject to the limitations of Table III. Proportions shall not be changed and materials with different physical or chemical characteristics shall not be used in grout for the work unless additional evidence is furnished that the grout meets the specified requirements.

2.4.1 Admixtures

In cold weather, a non-chloride based accelerating admixture may be used subject to approval. Accelerating admixture shall be non-corrosive, shall contain less than 0.2 percent chlorides, and shall conform to ASTM C 494/C 494M, Type C.

2.4.2 Grout Barriers

Grout barriers for vertical cores shall consist of fine mesh wire, fiberglass, or expanded metal.

2.5 ANCHORS, TIES, AND BAR POSITIONERS

Anchors and ties shall be fabricated without drips or crimps and shall be zinc-coated in accordance with ASTM A 153/A 153M, Class B-2. Steel wire used for anchors and ties shall be fabricated from steel wire conforming to ASTM A 82. Anchors and ties shall be sized to provide a minimum of 5/8 inch mortar cover from either face.

2.5.1 Wall to Wall Ties

Wall ties shall be rectangular-shaped (corrugated) with 1 1/2 inch vertical leg and 5/16 inch hole. Rectangular wall ties shall be no less than 2 inch wide, 8 1/2 inch long, 12 gauge stainless steel.

2.5.2 Bar Positioners

Bar positioners, used to prevent displacement of reinforcing bars during the course of construction, shall be factory fabricated from 9 gauge steel wire or equivalent, and coated with a hot-dip galvanized finish. Not more than one wire shall cross the cell.

2.5.3 Wall to Concrete Slab Ties

Partition top anchor shall be a factory-fabricated, stainless steel assembly consisting of a 1/4 inch thick plate welded to a 3/8 inch diameter, 8 inch long rod at the center of the plate face. Provide plate with two holes to accept fasteners. Provide each anchor with a clear acrylic tube with compressible polyethylene filler.

2.6 JOINT REINFORCEMENT

Joint reinforcement shall be factory fabricated from steel wire conforming to ASTM A 82, welded construction. Tack welding will not be acceptable in reinforcement used for wall ties. Wire shall have zinc coating conforming to ASTM A 153/A 153M, Class B-2. All wires shall be a minimum of 9 gauge. Reinforcement shall be ladder type design, having one longitudinal wire in the mortar bed of each face shell for hollow units and one wire for solid units. Joint reinforcement shall be placed a minimum of 5/8 inch cover from either face. The distance between crosswires shall not exceed 16 inches. Joint reinforcement for straight runs shall be furnished in flat sections not less than 10 feet long. Joint reinforcement shall be provided with factory formed corners and intersections.

2.7 REINFORCING STEEL BARS AND RODS

Reinforcing steel bars and rods shall conform to ASTM A 615/A 615M, Grade 60.

2.8 EXPANSION-JOINT MATERIALS

Compressible Filler: Use foamed polyurethane strip saturated with polybutylene waterproofing material. When compressed to 50 percent of its original volume, filler shall hold 6 feet of water hydrostatically, and 10 feet at 60 percent compression. Filler shall maintain its resiliency to allow for installation in temperatures as low as 40 F. Filler shall be waterproof when compressed to 50 percent of its original volume in temperatures from -40 F to +200 F. Elongation shall be at least 325 percent with a tensile strength of not less than 53 pounds per square inch. No migration of polybutylene compound in the polyurethane strip will be allowed.

Backer rod and sealant shall be adequate to accommodate joint compression equal to 50 percent of the width of the joint. The backer rod shall be compressible rod stock of polyethylene foam, polyurethane foam, butyl rubber foam, or other flexible, nonabsorptive material as recommended by the sealant manufacturer. Sealant shall conform to Section 07900JOINT SEALING.

PART 3 EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

3.1.1 Hot Weather Installation

The following precautions shall be taken if masonry is erected when the ambient air temperature is more than 99 degrees F in the shade and the relative humidity is less than 50 percent. All masonry materials shall be shaded from direct sunlight; mortar beds shall be spread no more than 4 feet ahead of masonry; masonry units shall be set within one minute of spreading mortar; and after erection, masonry shall be protected from direct exposure to wind and sun for 48 hours.

3.1.2 Cold Weather Installation

Before erecting masonry when ambient temperature or mean daily air temperature falls below 40 degrees F, a written statement of proposed cold weather construction procedures shall be submitted for approval. The following precautions shall be taken during all cold weather erection.

3.1.2.1 Preparation

Ice or snow formed on the masonry bed shall be thawed by the application of heat. Heat shall be applied carefully until the top surface of the masonry is dry to the touch. Sections of masonry deemed frozen and damaged shall be removed before continuing construction of those sections.

- a. Air Temperature 40 to 32 Degrees F. Sand or mixing water shall be heated to produce mortar temperatures between 40 degrees F and 120 degrees F.
- b. Air Temperature 32 to 25 Degrees F. Sand and mixing water shall be heated to produce mortar temperatures between 40 degrees F and

120 degrees F. Temperature of mortar on boards shall be maintained above freezing.

- c. Air Temperature 25 to 20 Degrees F. Sand and mixing water shall be heated to provide mortar temperatures between 40 degrees F and 120 degrees F. Temperature of mortar on boards shall be maintained above freezing. Sources of heat shall be used on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 15 mph.
- d. Air Temperature 20 Degrees F and below. Sand and mixing water shall be heated to provide mortar temperatures between 40 degrees F and 120 degrees F. Enclosure and auxiliary heat shall be provided to maintain air temperature above 32 degrees F. Temperature of units when laid shall not be less than 20 degrees F.

3.1.2.2 Completed Masonry and Masonry Not Being Worked On

- a. Mean daily air temperature 40 degrees F to 32 degrees F. Masonry shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.
- b. Mean daily air temperature 32 degrees F to 25 degrees F. Masonry shall be completely covered with weather-resistant membrane for 24 hours.
- c. Mean Daily Air Temperature 25 Degrees F to 20 Degrees F. Masonry shall be completely covered with insulating blankets or equally protected for 24 hours.
- d. Mean Daily Temperature 20 Degrees F and Below. Masonry temperature shall be maintained above 32 degrees F for 24 hours by enclosure and supplementary heat, by electric heating blankets, infrared heat lamps, or other approved methods.

3.2 LAYING MASONRY UNITS

Masonry units shall be laid in running bond pattern. Each unit shall be adjusted to its final position while mortar is still soft and plastic. Units that have been disturbed after the mortar has stiffened shall be removed, cleaned, and relaid with fresh mortar. Air spaces, cavities, chases, expansion joints, and spaces to be grouted shall be kept free from mortar and other debris. Units used in exposed masonry surfaces shall be selected from those having the least amount of chipped edges or other imperfections detracting from the appearance of the finished work. Vertical joints shall be kept plumb. Units being laid and surfaces to receive units shall be free of water film and frost. Solid units shall be laid in a nonfurrowed full bed of mortar. Units shall be shoved into place so that the vertical joints are tight. Vertical face shells of concrete masonry units, except where indicated at control, expansion, and isolation joints, shall be completely filled with mortar. Mortar will be permitted to protrude up to 1/2 inch into the space or cells to be grouted. Means shall be provided to prevent mortar from dropping into the space below.

3.2.1 Surface Preparation

Surfaces upon which masonry is placed shall be cleaned of laitance, dust, dirt, oil, organic matter, or other foreign materials and shall be slightly

roughened to provide a surface texture with a depth of at least 1/8 inch. Sandblasting shall be used, if necessary, to remove laitance from pores and to expose the aggregate.

3.2.2 Forms and Shores

Forms and shores shall be sufficiently rigid to prevent deflections which may result in cracking or other damage to supported masonry and sufficiently tight to prevent leakage of mortar and grout. Supporting forms and shores shall not be removed in less than 10 days.

3.2.3 Concrete Masonry Units

Units in piers, pilasters, columns, starting courses on footings, solid foundation walls, lintels, and beams, and where cells are to be filled with grout shall be full bedded in mortar under both face shells and webs. Other units shall be full bedded under both face shells. Head joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell. Foundation walls below grade shall be grouted solid. Jamb units shall be of the shapes and sizes to conform with wall units. Solid units may be incorporated in the masonry work where necessary to fill out at corners, gable slopes, and elsewhere as approved. Double walls shall be stiffened at wall-mounted plumbing fixtures by use of strap anchors, two above each fixture and two below each fixture, located to avoid pipe runs, and extending from center to center of the double wall. Walls and partitions shall be adequately reinforced for support of wall-hung plumbing fixtures when chair carriers are not specified.

3.2.4 [Enter Appropriate Subpart Title Here] 3.2.4.1 Solid Units

Bed and head joints shall be completely filled with mortar.

3.2.5 Tolerances

Masonry shall be laid plumb, true to line, with courses level. Bond pattern shall be kept plumb throughout. Corners shall be square unless noted otherwise. Masonry shall be laid within the following tolerances (plus or minus unless otherwise noted):

TABLE II
TOLERANCES

Variation from the plumb in the lines
and surfaces of columns, walls and arises

In adjacent masonry units	1/8 inch
In 10 feet	1/4 inch
In 20 feet	3/8 inch
In 40 feet or more	1/2 inch

Variations from the plumb for external corners,
expansion joints, and other conspicuous lines

In 20 feet	1/4 inch
In 40 feet or more	1/2 inch

TOLERANCES

Variations from the level for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines

In 20 feet	1/4 inch
In 40 feet or more	1/2 inch

Variation from level for bed joints and top surfaces of bearing walls

In 10 feet	1/4 inch
In 40 feet or more	1/2 inch

Variations from horizontal lines

In 10 feet	1/4 inch
In 20 feet	3/8 inch
In 40 feet or more	1/2 inch

Variations in cross sectional dimensions of columns and in thickness of walls

Minus	1/4 inch
Plus	1/2 inch

3.2.6 Cutting and Fitting

Full units of the proper size shall be used wherever possible, in lieu of cut units. Cutting and fitting, including that required to accommodate the work of others, shall be done by masonry mechanics using power masonry saws. Concrete masonry units may be wet or dry cut. Wet cut units, before being placed in the work, shall be dried to the same surface-dry appearance as uncut units being laid in the wall. Cut edges shall be clean, true and sharp. Openings in the masonry shall be made carefully so that wall plates, cover plates or escutcheons required by the installation will completely conceal the openings and will have bottoms parallel with the masonry bed joints. Reinforced masonry lintels shall be provided above openings over 12 inches wide for pipes, ducts, cable trays, and other wall penetrations, unless steel sleeves are used.

3.2.7 Jointing

Joints shall be tooled when the mortar is thumbprint hard. Horizontal joints shall be tooled last. Joints shall be brushed to remove all loose and excess mortar. Mortar joints shall be finished as follows:

3.2.7.1 Tooled Joints

Joints in exposed exterior and interior masonry surfaces shall be tooled slightly concave. Joints shall be tooled with a jointer slightly larger than the joint width so that complete contact is made along the edges of the unit. Tooling shall be performed so that the mortar is compressed and

the joint surface is sealed. Jointer of sufficient length shall be used to obtain a straight and true mortar joint.

3.2.7.2 Door and Window Frame Joints

On the exposed interior side of exterior frames, joints between frames and abutting masonry walls shall be raked to a depth of 3/8 inch. On the exterior side of exterior frames, joints between frames and abutting masonry walls shall be raked to a depth of 3/8 inch.

3.2.8 Joint Widths

Joint widths shall be as follows:

3.2.8.1 Concrete Masonry Units

Concrete masonry units shall have 3/8 inch joints, except for prefaced concrete masonry units.

3.2.9 Embedded Items

Spaces around built-in items shall be filled with mortar. Openings around flush-mount electrical outlet boxes in wet locations shall be pointed with mortar. Anchors, ties, wall plugs, accessories, flashing, pipe sleeves and other items required to be built-in shall be embedded as the masonry work progresses. Anchors, ties and joint reinforcement shall be fully embedded in the mortar. Cells receiving anchor bolts and cells of the first course below bearing plates shall be filled with grout.

3.2.10 Unfinished Work

Unfinished work shall be stepped back for joining with new work. Tothing may be resorted to only when specifically approved. Loose mortar shall be removed and the exposed joints shall be thoroughly cleaned before laying new work.

3.2.11 Partitions

Partitions shall be continuous from floor to underside of floor or roof deck where shown. An isolation joint shall be placed in the intersection between partitions and structural or exterior walls as shown. Cells within vertical plane of ties shall be filled solid with grout for full height of partition or solid masonry units may be used. Interior partitions having masonry walls over 4 inches thick shall be tied together with joint reinforcement.

3.3 MORTAR

Mortar shall be mixed in a mechanically operated mortar mixer for at least 3 minutes, but not more than 5 minutes. Measurement of ingredients for mortar shall be by volume. Ingredients not in containers, such as sand, shall be accurately measured by the use of measuring boxes. Water shall be mixed with the dry ingredients in sufficient amount to provide a workable mixture which will adhere to the vertical surfaces of masonry units. Mortar that has stiffened because of loss of water through evaporation shall be retempered by adding water to restore the proper consistency and workability. Mortar that has reached its initial set or that has not been used within 2-1/2 hours after mixing shall be discarded.

3.4 REINFORCING STEEL

Reinforcement shall be cleaned of loose, flaky rust, scale, grease, mortar, grout, or other coating which might destroy or reduce its bond prior to placing grout. Bars with kinks or bends not shown on the drawings shall not be used. Reinforcement shall be placed prior to grouting. Unless otherwise indicated, vertical wall reinforcement shall extend to within 2 inches of tops of walls.

3.4.1 Positioning Bars

Vertical bars shall be accurately placed within the cells at the positions indicated on the drawings. A minimum clearance of 1/2 inch shall be maintained between the bars and masonry units. Minimum clearance between parallel bars shall be one diameter of the reinforcement. Vertical reinforcing may be held in place using bar positioners located near the ends of each bar and at intermediate intervals of not more than 192 diameters of the reinforcement. Column and pilaster ties shall be wired in position around the vertical steel. Ties shall be in contact with the vertical reinforcement and shall not be placed in horizontal bed joints.

3.4.2 Splices

Bars shall be lapped a minimum of 48 diameters of the reinforcement. Welded or mechanical connections shall develop at least 125 percent of the specified yield strength of the reinforcement.

3.5 JOINT REINFORCEMENT

Joint reinforcement shall be installed at 16 inches on center or as indicated. Reinforcement shall be lapped not less than 6 inches. Prefabricated sections shall be installed at corners and wall intersections. The longitudinal wires of joint reinforcement shall be placed to provide not less than 5/8 inch cover to either face of the unit.

3.6 PLACING GROUT

Cells containing reinforcing bars shall be filled with grout. Hollow masonry units in walls or partitions supporting plumbing, heating, or other mechanical fixtures, voids at door and window jambs, and other indicated spaces shall be filled solid with grout. Cells under lintel bearings on each side of openings shall be filled solid with grout for full height of openings. Walls below grade, lintels, and bond beams shall be filled solid with grout. Units other than open end units may require grouting each course to preclude voids in the units. Grout not in place within 1-1/2 hours after water is first added to the batch shall be discarded. Sufficient time shall be allowed between grout lifts to preclude displacement or cracking of face shells of masonry units. If blowouts, flowouts, misalignment, or cracking of face shells should occur during construction, the wall shall be torn down and rebuilt.

3.6.1 Vertical Grout Barriers for Fully Grouted Walls

Grout barriers shall be provided not more than 30 feet apart, or as required, to limit the horizontal flow of grout for each pour.

3.6.2 Horizontal Grout Barriers

Grout barriers shall be embedded in mortar below cells of hollow units

receiving grout.

3.6.3 Grout Holes and Cleanouts

3.6.3.1 Grout Holes

Grouting holes shall be provided in slabs, spandrel beams, and other in-place overhead construction. Holes shall be located over vertical reinforcing bars or as required to facilitate grout fill in bond beams. Additional openings spaced not more than 16 inches on centers shall be provided where grouting of all hollow unit masonry is indicated. Openings shall not be less than 4 inches in diameter or 3 by 4 inches in horizontal dimensions. Upon completion of grouting operations, grouting holes shall be plugged and finished to match surrounding surfaces.

3.6.3.2 Cleanouts for Hollow Unit Masonry Construction

Cleanout holes shall be provided at the bottom of every pour in cores containing vertical reinforcement when the height of the grout pour exceeds 5 feet. Where all cells are to be grouted, cleanout courses shall be constructed using bond beam units in an inverted position to permit cleaning of all cells. Cleanout holes shall be provided at a maximum spacing of 32 inches where all cells are to be filled with grout. A new series of cleanouts shall be established if grouting operations are stopped for more than 4 hours. Cleanouts shall not be less than 3 by 4 inch openings cut from one face shell. Manufacturer's standard cutout units may be used at the Contractor's option. Cleanout holes shall not be closed until masonry work, reinforcement, and final cleaning of the grout spaces have been completed and inspected. For walls which will be exposed to view, cleanout holes shall be closed in an approved manner to match surrounding masonry.

3.6.4 Grouting Equipment

3.6.4.1 Grout Pumps

Pumping through aluminum tubes will not be permitted. Pumps shall be operated to produce a continuous stream of grout without air pockets, segregation, or contamination. Upon completion of each day's pumping, waste materials and debris shall be removed from the equipment, and disposed of outside the masonry.

3.6.4.2 Vibrators

Internal vibrators shall maintain a speed of not less than 5,000 impulses per minute when submerged in the grout. At least one spare vibrator shall be maintained at the site at all times. Vibrators shall be applied at uniformly spaced points not further apart than the visible effectiveness of the machine. Duration of vibration shall be limited to time necessary to produce satisfactory consolidation without causing segregation.

3.6.5 Grout Placement

Masonry shall be laid to the top of a pour before placing grout. Grout shall not be placed in two-wythe solid unit masonry cavity until mortar joints have set for at least 3 days during hot weather and 5 days during cold damp weather. Grout shall not be placed in hollow unit masonry until mortar joints have set for at least 24 hours. Grout shall be placed using a hand bucket, concrete hopper, or grout pump to completely fill the grout

spaces without segregation of the aggregates. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. The height of grout pours and type of grout used shall be limited by the dimensions of grout spaces as indicated in Table III. Low-lift grout methods may be used on pours up to and including 5 feet in height. High-lift grout methods shall be used on pours exceeding 5 feet in height.

3.6.5.1 Low-Lift Method

Grout shall be placed at a rate that will not cause displacement of the masonry due to hydrostatic pressure of the grout. Mortar protruding more than 1/2 inch into the grout space shall be removed before beginning the grouting operation. Grout pours 12 inches or less in height shall be consolidated by mechanical vibration or by puddling. Grout pours over 12 inches in height shall be consolidated by mechanical vibration and reconsolidated by mechanical vibration after initial water loss and settlement has occurred. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. Low-lift grout shall be used subject to the limitations of Table III.

3.6.5.2 High-Lift Method

Mortar droppings shall be cleaned from the bottom of the grout space and from reinforcing steel. Mortar protruding more than 1/4 inch into the grout space shall be removed by dislodging the projections with a rod or stick as the work progresses. Reinforcing, bolts, and embedded connections shall be rigidly held in position before grouting is started. CMU units shall not be pre-wetted. Grout, from the mixer to the point of deposit in the grout space shall be placed as rapidly as practical by pumping and placing methods which will prevent segregation of the mix and cause a minimum of grout splatter on reinforcing and masonry surfaces not being immediately encased in the grout lift. The individual lifts of grout shall be limited to 4 feet in height. The first lift of grout shall be placed to a uniform height within the pour section and vibrated thoroughly to fill all voids. This first vibration shall follow immediately behind the pouring of the grout using an approved mechanical vibrator. After a waiting period sufficient to permit the grout to become plastic, but before it has taken any set, the succeeding lift shall be poured and vibrated 12 to 18 inches into the preceding lift. If the placing of the succeeding lift is going to be delayed beyond the period of workability of the preceding, each lift shall be reconsolidated by reworking with a second vibrator as soon as the grout has taken its settlement shrinkage. The waiting, pouring, and reconsolidation steps shall be repeated until the top of the pour is reached. The top lift shall be reconsolidated after the required waiting period. The high-lift grouting of any section of wall between vertical grout barriers shall be completed to the top of a pour in one working day unless a new series of cleanout holes is established and the resulting horizontal construction joint cleaned. High-lift grout shall be used subject to the limitations in Table III.

TABLE III

POUR HEIGHT AND TYPE OF GROUT FOR VARIOUS GROUT SPACE DIMENSIONS

Maximum Grout Pour Height (feet) (4)	Grout Type	Grouting Procedure	Minimum Dimensions of the Total Clear Areas Within Grout Spaces and Cells (in.) (1,2)	
			Multiwythe Masonry (3)	Hollow-unit Masonry
1	Fine	Low Lift	3/4	1-1/2 x 2
5	Fine	Low Lift	2	2 x 3
8	Fine	High Lift	2	2 x 3
12	Fine	High Lift	2-1/2	2-1/2 x 3
24	Fine	High Lift	3	3 x 3
1	Coarse	Low Lift	1-1/2	1-1/2 x 3
5	Coarse	Low Lift	2	2-1/2 x 3
8	Coarse	High Lift	2	3 x 3
12	Coarse	High Lift	2-1/2	3 x 3
24	Coarse	High Lift	3	3 x 4

Notes:

- (1) The actual grout space or cell dimension must be larger than the sum of the following items:
 - a) The required minimum dimensions of total clear areas given in the table above;
 - b) The width of any mortar projections within the space;
 - c) The horizontal projections of the diameters of the horizontal reinforcing bars within a cross section of the grout space or cell.
- (2) The minimum dimensions of the total clear areas shall be made up of one or more open areas, with at least one area being 3/4 inch or greater in width.
- (3) For grouting spaces between masonry wythes.
- (4) Where only cells of hollow masonry units containing reinforcement are grouted, the maximum height of the pour shall not exceed the distance between horizontal bond beams.

3.7 BOND BEAMS

Bond beams shall be filled with grout and reinforced as indicated on the drawings. Grout barriers shall be installed under bond beam units to retain the grout as required. Reinforcement shall be continuous, including around corners, except through control joints or expansion joints, unless otherwise indicated on the drawings. Where splices are required for continuity, reinforcement shall be lapped 48 bar diameters. A minimum clearance of 1/2 inch shall be maintained between reinforcement and interior faces of units.

3.8 LINTELS

3.8.1 Masonry Lintels

Masonry lintels shall be constructed with lintel units filled solid with

grout in all courses and reinforced with a minimum of two No. 4 bars in the bottom course unless otherwise indicated on the drawings. Lintel reinforcement shall extend beyond each side of masonry opening 40 bar diameters or 24 inches, whichever is greater. Reinforcing bars shall be supported in place prior to grouting and shall be located 1/2 inch above the bottom inside surface of the lintel unit.

3.9 ANCHORAGE TO CONCRETE

3.9.1 Anchorage to Concrete

Anchorage of masonry to the face of existing concrete columns, beams, or walls shall be with wall tie anchors spaced not over 16 inches on centers.

3.9.2 Anchorage of Masonry

Anchorage of masonry to the face of existing concreted beams or slabs shall be with wall to concrete slab ties spaced not over 16 inches on centers.

3.10 POINTING AND CLEANING

After mortar joints have attained their initial set, but prior to hardening, mortar and grout daubs or splashings shall be completely removed from masonry-unit surfaces that will be exposed or painted. Before completion of the work, defects in joints of masonry to be exposed or painted shall be raked out as necessary, filled with mortar, and tooled to match existing joints. Immediately after grout work is completed, scum and stains which have percolated through the masonry work shall be removed using a high pressure stream of water and a stiff bristled brush. Masonry surfaces shall not be cleaned, other than removing excess surface mortar, until mortar in joints has hardened. Masonry surfaces shall be left clean, free of mortar daubs, dirt, stain, and discoloration, including scum from cleaning operations, and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning.

3.10.1 Concrete Masonry Unit

Exposed concrete masonry unit surfaces shall be dry-brushed at the end of each day's work and after any required pointing, using stiff-fiber bristled brushes.

-- End of Section --