

US Army Corps
of Engineers
Baltimore District

CONSTRUCTION SPECIFICATIONS

DALECARLIA PUMPING STATION ROOF REPAIR

**WASHINGTON AQUEDUCT, WASHINGTON,
DC**

INVITATION FOR BIDS **DACW31-02-B-0029**

CONTRACT NO.

DATE **JUN 17, 2002**

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SECTION 01000

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 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

Title Evidence

Proof of purchase for equipment and/or materials.

Invoice Copies

Proof of rental equipment costs.

Payment Evidence

Proof of full payment.

Photographs

SD-03 Product Data

Cost or Pricing Data

Proof of actual equipment costs.

SD-05 Design Data

Progress Schedule; G WA.

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

1.2 PROGRESS SCHEDULING AND REPORTING (AUG. 1999)

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. Contractor prepared form shall contain the same information as shown on the attached NADB Form 1153 ("Physical Construction Progress Chart" (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 proactive 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 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)

1.8 PHOTOGRAPHS

PHOTOGRAPHIC COVERAGE: (SEP 85) The Contractor shall furnish ten each 8" x 10" (commercial grade color photographs of the project (with negatives) to the Contracting Officer). These photographs shall be taken at systematic intervals during the contract where and when directed by the Contracting Officer. (CENAB-CO)

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

NOT APPLICABLE

ATTACHMENTS:

NADB Form 1153 ("Physical Construction Progress Chart")

-- End of Section --

SECTION 01050

JOB CONDITIONS

PART 1 GENERAL

1.1 LAYOUT OF WORK

(APR 1984) The Contractor shall lay out his work and shall be held responsible for all measurement's in connection therewith. The Contractor shall furnish, at his own expense, all stakes, 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 grades as may be established or indicated by the Contracting Officer. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed, by the Contractor or through his negligence, prior to their authorized removal, they may be placed by the Contracting Officer at his discretion. The expense of replacement will be deducted from any amounts due or to become due the Contractor. (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 to the Dalecarlia Water Treatment Plant is MacArthur Boulevard. Public bus service is provided by the Washington Metropolitan Area Transit service.

1.2.2 Explorations

The physical conditions indicated on the drawings and in the specifications are the result of site investigations by surveys, drawings examination and observation.

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-01 Preconstruction Submittals

Shut Down Utility Services; G WA.

Prior approval for service/utility interruptions.

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, piping, 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)

1.5 DISPOSAL OF EXISTING MATERIAL: (DEC 1975)

All removed, dismantled or demolished material 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 WATER TREATMENT PLANT REGULATIONS: (JUL 1980)

The site of the work is on Corps of Engineers property and all rules and regulations issued by the Chief, Washington Aqueduct Division 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.

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 exterior and doorways to allow minimal disruption of normal activities around the building. No equipment or new materials are to be stored in the building. All existing equipment, materials and debris removed during the work that are not to be reinstalled shall be removed daily by the Contractor from around 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. 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 and other Contractors' personnel 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 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)

1.10 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)

1.11 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

1.11.1 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.

1.11.2 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

Washington Aqueduct Division (WAD), Washington, D.C.

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

1.11.3 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 paragraph "Anticipated Adverse Weather Delays", 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)".

1.12 WORKING HOURS

WORKING HOURS: Contractor working hours at the site are 7:00 am to 3:30 pm, Monday through Friday.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

NOT APPLICABLE

-- End of Section --

SECTION 01060

SAFETY

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. All interim changes (changes made between publications of new editions) to the U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, will be posted on the Headquarters Website. The date that it is posted shall become the official effective date of the change and contracts awarded after this date shall require to comply accordingly. The website location where these changes can be found is under the button entitled "Changes to EM", located at: "http://www.hq.usace.army.mil/soh/hqusace_soh.htm".

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 "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

Safety Supervisor; G WA.

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

SD-07 Certificates

Language Certification

It is the Contractors responsibility to ensure that all employees understand the basic English language.

SD-09 Reports

Activity Phase Hazard Analysis Plan; G WA.

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

Outline Report

A report for each past activities review.

OSHA Log

A log shall be reported monthly for injuries.

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, language 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 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 Contracting Officer's Representative 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:

- a. Written designation of safety representative.
- b. Written project specific accident prevention plan.
- c. Written activity phase hazard analysis plan.

PART 2 PRODUCT
NOT APPLICABLE

PART 3 EXECUTION
NOT APPLICABLE

-- End of Section --

SECTION 01200

WARRANTY REQUIREMENT

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 WARRANTY PAYMENT

Warranty work is a subsidiary portion of the contract work, and has a value to the Government of \$5,000. 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).

1.3 PERFORMANCE BOND:

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

1.3.1 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.

1.4 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.

PART 2 PRODUCTS - NOT APPLICABLE

PART 3 EXECUTION - NOT APPLICABLE

-- End of Section --

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

SD-02 Shop Drawings

SD-03 Product Data

SD-04 Samples

SD-05 Design Data

SD-06 Test Reports

SD-07 Certificates

SD-11 Closeout Submittals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

Government 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 Contractor Quality Control (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 used)

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) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager 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

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 files, containing the computerized ENG Form 4288 and instructions on the use of the files. These submittal register files will be furnished on the Award CD-ROM disk. Columns "c" through "f" have been completed by the Government; the Contractor shall complete columns "a" and "g" through "i" 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 30 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)

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 30 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.

3.5 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 his 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. Four (4) copies of the submittal will be retained by the Contracting Officer and two (2) 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>
--

3.10 CERTIFICATES OF COMPLIANCE: (MAY 1969)

Any Certificate required for demonstrating proof of compliance of materials with specification requirements shall be executed in four (4) copies. Each certificate shall be signed by an official authorized to certify in behalf on the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements. (CENAB)

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

Dalecarlia Pumping Station Roof Repair

CONTRACTOR

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 I F I C S E C T	D E S C R I P T I O N	P A R A G R A P H #	G O V E R N M E N T C L A S S I F I C A T I O N	C O N T R A C T O R : S C H E D U L E D A T E S			C O N T R A C T O R A C T I O N		A P P R O V I N G A U T H O R I T Y				M A I L E D T O C O N T R A C T O R	R E M A R K S	
						S U B M I T	B Y	B Y	A C T I O N	D A T E O F	D A T E F R O M	D A T E F R O M	D A T E F R O M	D A T E O F			D A T E O F
	01000		SD-01 Preconstruction Submittals														
			Title Evidence														
			Invoice Copies														
			Payment Evidence														
			Photographs	1.8													
			SD-03 Product Data														
			Cost or Pricing Data	1.6													
			SD-05 Design Data														
			Progress Schedule	1.2	G WA												
	01050		SD-01 Preconstruction Submittals														
			Shut Down Utility Services		G WA												
	01060		SD-01 Preconstruction Submittals														
			Safety Supervisor	1.3	G WA												
			SD-07 Certificates														
			Language Certification	1.3													
			SD-09 Manufacturer's Field														
			Reports														
			Activity Phase Hazard Analysis	1.3	G WA												
			Plan														
			Outline Report														
			OSHA Log														
	01451		SD-01 Preconstruction Submittals														
			CQC Plan	3.2	G WA												
			Phase Notification														
			Request		G WA												
			CQC Mgr Qualification		G WA												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Dalecarlia Pumping Station Roof Repair																	
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION	PARAGRAPH	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					REMARKS	
						APPROVAL NEEDED	MATERIAL NEEDED		ACTION	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	DATE OF ACTION	DATE RCD FRM APPR AUTH		MAILED TO CONTR/
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
	01451		SD-05 Design Data														
			Notification of Changes	3.2.4													
			Punchlist	3.7.1													
			Minutes	3.3													
			SD-06 Test Reports														
			QC Records		G WA												
	01510		SD-02 Shop Drawings														
			Temporary Work Platform	1.5	G WA												
	01562		SD-01 Preconstruction Submittals														
			Implementation	1.5	G WA												
	01720		SD-11 Closeout Submittals														
			Progress Prints		G WA												
			Final Requirements	1.6	G WA												
			CADD Files														
	02220		SD-03 Product Data														
			Work Plan		G WA												
	03910		SD-03 Product Data														
			Proportions of Mixture	1.10	G WA												
			Qualifications	1.5													
			SD-04 Samples														
			Materials	2.1	G WA												
			SD-07 Certificates														
			Materials	2.1													
	06100		SD-07 Certificates														
			Grading and Marking	2.1.1	G WA												
	07310		SD-02 Shop Drawings														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

Dalecarlia Pumping Station Roof Repair

CONTRACTOR

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 T S E C T	D E S C R I P T I O N	P A R A G R A P H G #	C L A S S I F I C A T I O N	C O N T R A C T O R : S C H E D U L E D A T E S			C O N T R A C T O R : A C T I O N		A P P R O V I N G A U T H O R I T Y				M A I L E D T O C O N T R A C T O R / A U T H O R I T Y	R E M A R K S					
						S U B M I T	B Y	B Y	A C T I O N	C O D E	D A T E O F	D A T E F W D F R O M	D A T E F W D T O O T H E R	D A T E R C D F R O M			D A T E R C D F R O M	A C T I O N	C O D E	D A T E O F	D A T E R C D F R O M
	07310		Drawings		G WA																
			SD-03 Product Data																		
			Protection Plan	3.1.1	G WA																
			Qualifications	1.3	G WA																
			SD-04 Samples																		
			Slate	2.1.2	G WA																
			Accessories for Slate Roofs	3.5	G WA																
			Sealants		G WA																
			Underlayment Membrane	2.1.3	G WA																
			Fasteners		G WA																
			SD-07 Certificates																		
			Materials	2.1																	
	07625		SD-02 Shop Drawings																		
			Sheet Metal	3.11	G WA																
			SD-03 Product Data																		
			Contractor Quality Control	3.11																	
			SD-04 Samples																		
			Materials	2.1	G WA																

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 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) |
- THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED**
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

SECTION 01420

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

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

1.2 ORDERING INFORMATION

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

ACI INTERNATIONAL (ACI)

P.O. Box 9094
Farmington Hills, MI 48333-9094
Ph: 248-848-3700
Fax: 248-848-3701
Internet: <http://www.aci-int.org>
AOK 6/00
LOK 6/00

AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC)

7012 So. Revere Parkway, Suite 140
Englewood, CO 80112
Ph: 303-792-9559
Fax: 303-792-0669
Internet: www.aitc-glulam.org
AOK 6/00
LOK 6/00

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
Ph: 610-832-9585
Fax: 610-832-9555
Internet: www.astm.org

AOK 6/00
LOK 6/00

NOTE: The annual ASTM Book of Standards (66 Vol) is available for \$3500.00. Prices of individual standards vary.

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

P.O. Box 5690
Grandbury, TX 76049-0690
Ph: 817-326-6300
Fax: 817-326-6306
Internet: <http://www.awpa.com>
AOK 8/00
LOK 6/00

NOTE: AWPA Book of Standards is published yearly @\$75.00; individual standards may be ordered separately for \$12.00 to \$28.00 each.

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

P.O.Box 11700
Tacoma, WA 98411-0700
Ph: 253-565-6600
Fax: 253-565-7265
Internet: www.apawood.org
AOK 8/00
LOK 6/00

Note: Prices are available only by calling APA

CORPS OF ENGINEERS (COE)

Order from:
U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services
Branch, TIC
3909 Halls Ferry Rd.
Vicksburg, MS 39180-6199
Ph: 601-634-2664
Fax: 601-634-2388
Internet: www.usace.army.mil
AOK 8/00
LOK 6/00

NOTE: COE Handbook for Concrete and Cement (Documents w/prefix CRD-C) (1949-present; 2 Vol) free to Government offices; \$10.00 plus \$8.00 per yr for 4 qtrly supplements to others). Individual documents, single copies free. Order from address above.

NATIONAL HARDWOOD LUMBER ASSOCIATION (NHLA)

P.O. Box 34518
Memphis, TN 38184-0518
Ph: 901-377-1818
Fax: 901-382-6419
e-mail: nhla@natlhardwood.org
Internet: natlhardwood.org
AOK 8/00
LOK 6/00

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

10255 W. Higgins Rd., Suite 600
Rosemont, IL 60018
Ph: 847-299-9070
Fax: 847-299-1183
Internet: www.nrca.net
AOK 8/00
LOK 6/00

NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION (NELMA)

272 Tuttle Road
P.O. Box 87A
Cumberland Center, ME 04021
Ph: 207-829-6901
Fax: 207-829-4293
Internet: www.nelma.org
e-mail: nelma@javanet.com
AOK 8/00
LOK 6/00

SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION
(SMACNA)

4201 Lafayette Center Dr.,
Chantilly, VA 20151-1209
Ph: 703-803-2980
Fax: 703-803-3732
Internet: http://www.smacna.org
e-mail: info@smacna.org
AOK 8/00
LOK 6/00

SOUTHERN CYPRESS MANUFACTURERS ASSOCIATION (SCMA)

400 Penn Center Boulevard, Suite 530
Pittsburgh, PA 15235
Ph: 412-829-0770
Fax: 412-829-0844
Internet: www.cypressinfo.org
AOK 8/00

LOK 6/00

SOUTHERN PINE INSPECTION BUREAU (SPIB)

4709 Scenic Highway
Pensacola, FL 32504-9094
Ph: 850-434-2611
Fax: 850-433-5594
e-mail: spib@spib.org
Internet: www.spib.org
AOK 8/00
LOK 6/00

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)

P.O. Box 23145
Portland, OR 97281
Ph: 503-639-0651
Fax: 503-684-8928
internet: www.wclib.org
e-mail: info@wclib.org
AOK 8/00
LOK 6/00

WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)

Yeon Bldg.
522 SW 5th Ave.
Suite 500
Portland, OR 97204-2122
Ph: 503-224-3930
Fax: 503-224-3934
Internet: www.wwpa.org
e-mail: info@wwpa.org
AOK 8/00
LOK 6/00

-- End of Section --

SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 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.

1.2 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

CQC Plan; G WA.

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

Phase Notification

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

Request; G WA.

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

CQC Mgr Qualification; G WA.

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

SD-05 Design Data

Notification of Changes

Any changes made by the Contractor.

Punchlist

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.

Minutes

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

SD-06 Test Reports

QC Records; G WA.

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

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

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 site 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 the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

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, tests, 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. The Contractor shall include a copy of his proposed laboratory's latest Corps of Engineers inspection report in the Quality Control Plan. The inspection report details the tests that the lab has been validated to perform under Corps of Engineers contracts. (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 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility

to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, show drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to 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 construction person with a minimum of 3 years in related work. 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 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, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables 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, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.
- 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 COMPLETION INSPECTION

3.7.1 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.

3.7.2 Pre-Final Inspection

The Government will perform pre-final 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 of the work if the project is divided into increments by separate completion dates.

3.7.3 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 the final acceptance 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".

3.8 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 shall 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 and deliverables 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.

3.9 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.10 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 --

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

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 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-02 Shop Drawings

Temporary Work Platform; G WA.

The Contractor shall submit a temporary work platform sketch showing how he intends to erect and install the platform prior to performing any work on the roof.

1.3 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)

1.4 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)

1.5 TEMPORARY WORK PLATFORM

The temporary work platform shall be in accordance with Section 22 of EM 385-1-1 U.S. Army Corps of Engineers Safety and Health Requirements Manual. The Contractor shall submit for approval a sketch of the temporary work platform prior to performing any work on the roof. The submittal package shall also include the following information; how the platform will be erected and installed, its max. load capacity, personnel access, methodology for material removal and installation, etc. The Contractor shall not be allowed to attach any anchors to the masonry brick or cast stone.

1.5.1 Safety

To ensure the safety of the workers, the work platform shall be erected all around the perimeter of the building.

1.5.2 Access

The Contractor ensure that his temporary work platform does not block access via any of the doors leading into the Pumping Station.

1.6 BARRICADES

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazardous areas during both day and night. (CENAB)

PART 2 PRODUCT

NOT APPLICABLE

PART 3 EXECUTION

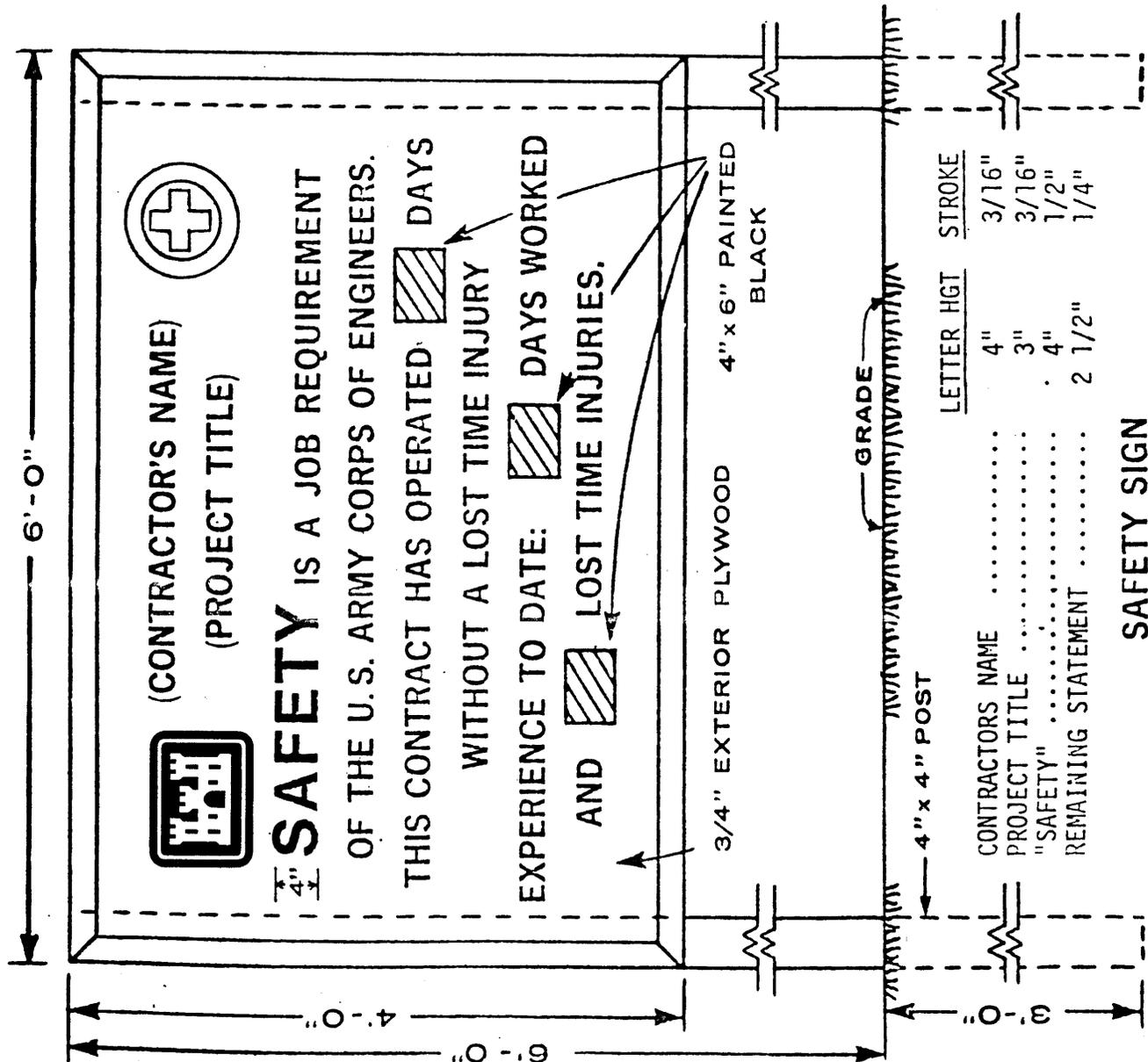
NOT APPLICABLE

ATTACHMENTS:

Attachment 1 Project Sign

Attachment 2 Safety Sign

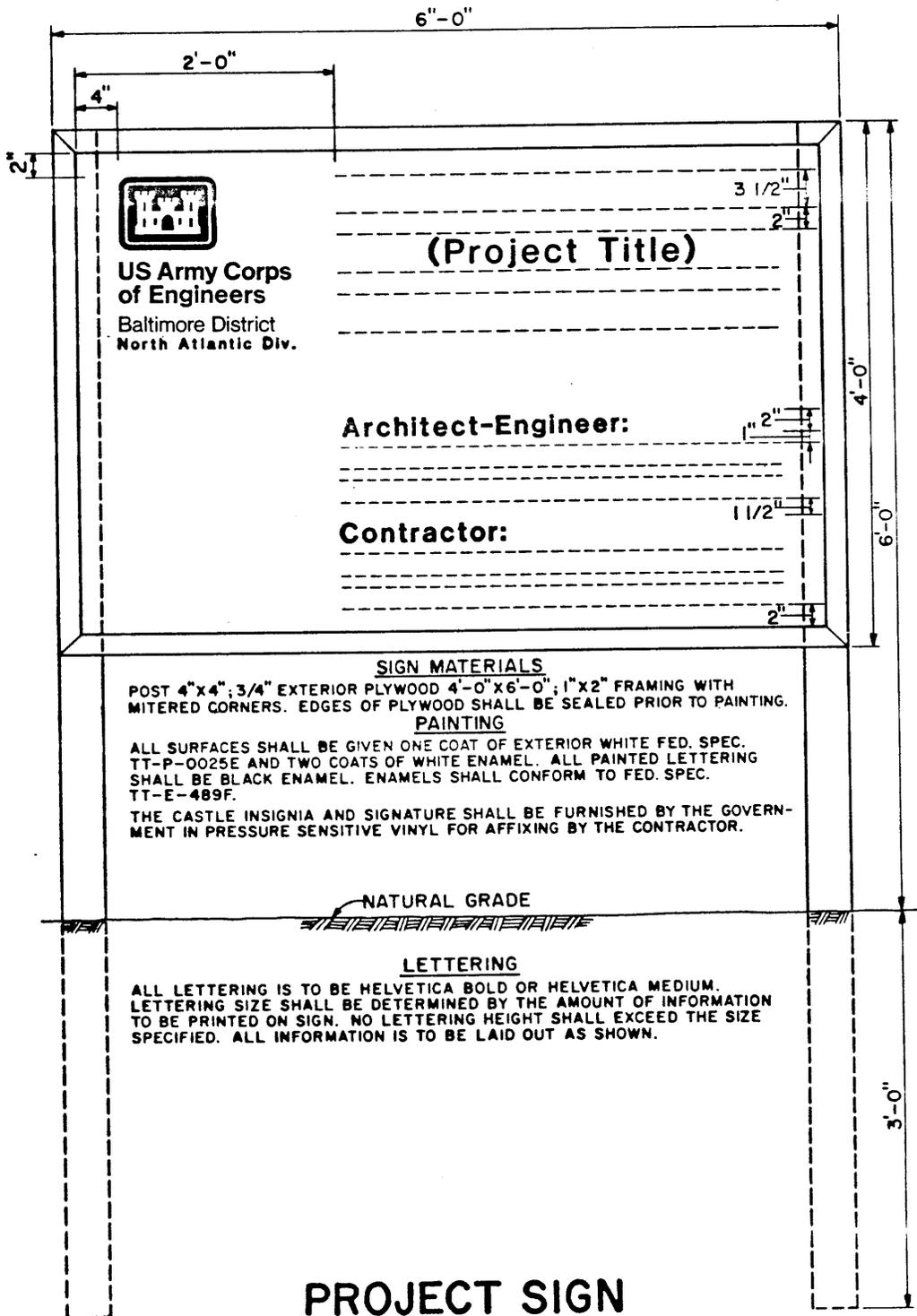
-- End of Section --



SIGN MATERIALS

POST 4"x4"; 3/4" EXTERIOR PLYWOOD 4'-0"x6'-0", 2"x2" 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

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 WA.

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

Burning shall not be allowed.

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

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

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, dimensions of equipment foundations, etc.

The topography, invert elevations and grades of all drainage installed or affected as a part of the project construction.

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 "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-11 Closeout Submittals

Progress Prints; G WA.

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

Final Requirements; G WA.

CADD Files.

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 a CALS Type 1, Group 4, Raster Image File of each contract drawing.

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 Release 2000 and CAD Overlay Release 2000 CADD software system. The mediafiles 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 inch 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 - while the title block sample attachments do not depict the contract drawings' title blocks,

the sample revision blocks above these attachments are to be used as guidance in completing the actual contract drawings' revision blocks.

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 400 dpi 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 02220

DEMOLITION

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

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.

1.5.2 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, 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.

1.5.3 Protection From the Weather

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

1.5.4 Protection of Trees

Trees within the project site which might be damaged during demolition, and which are indicated to be left in place, shall be protected by a 6 foot high fence. The fence shall be securely erected a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the work under this contract shall be replaced in kind or as approved by the Contracting Officer.

1.5.5 Environmental Protection

The work shall comply with the requirements of Section 01562 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.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EXISTING SLATE ROOF, COPPER GUTTER LININGS AND DOWNSPOUTS

Existing structures indicated shall be removed as indicated in drawings.

3.2 DISPOSITION OF MATERIAL

Title to material and equipment to be demolished, 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.

3.2.1 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.

3.2.2 Unsalvageable Material

All unsalvageable material shall be disposed of immediately in the Contractor's own disposal area located off Government-controlled land.

3.3 CLEAN UP

Debris and rubbish shall be removed from adjacent roof areas. Debris 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 03910

CAST STONE REPAIRS AND CLEANING

PART 1 GENERAL

1.1 SCOPE OF WORK

The work covered by this section consists of furnishing all material, labor and equipment in connection with the cleaning, caulking and repair of the architectural cast stone, in accordance with this specification and the contract drawings. The Contractor shall plan to repair approximately 5 cubic feet of roof perimeter cast stone as directed by the Contracting Officer. He shall also re-caulk all joints (approx. 600 LF) between the cast stones above elevation 175.85.

1.2 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 201.1R	(1992) Guide for Making a Condition Survey of Concrete in Service
ACI 211.1	(1991) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 224.1R	(1993) Causes, Evaluation, and Repair of Cracks in Concrete Structures
ACI 301	(1996) Standard Specifications for Structural Concrete
ACI 304R	(1989) Guide for Measuring, Mixing, Transporting and Placing Concrete
ACI 315	(1992) Details and Detailing of Concrete Reinforcement
ACI 364.1R	(1994) Guide for Evaluation of Concrete Structures Prior to Rehabilitation
ACI 437R	(1991) Strength Evaluation of Existing Concrete Buildings
ACI Compilation 10	(1990) Repair and Rehabilitation of Concrete Structures
ACI Compilation 20	(1993) Repair and Rehabilitation II

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 33	(1999a) Concrete Aggregates
ASTM C 39	(1996) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42	(1999) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 109/C 109M	(1999) Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens)
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 150	(1999a) Portland Cement
ASTM C 171	(1997a) Sheet Materials for Curing Concrete
ASTM C 192/C 192M	(1998) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 260	(1998) Air-Entraining Admixtures for Concrete
ASTM C 295	(1998) Petrographic Examination of Aggregates for Concrete
ASTM C 457	(1998) Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete
ASTM C 494	(1999) Chemical Admixtures for Concrete
ASTM C 618	(1999) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 642	(1997) Density, Absorption, and Voids in Hardened Concrete
ASTM C 823	(1995) Examination and Sampling of Hardened Concrete in Construction
ASTM C 856	(1995e1) Petrographic Examination of Hardened Concrete
ASTM C 881	(1999) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 920	(1998) Elastomeric Joint Sealants

ASTM C 979	(1999) Pigments for Integrally Colored Concrete
ASTM C 989	(1999) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM C 1017	(1998) Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1107	(1999) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C 1218/C 1218M	(1999) Water-Soluble Chloride in Mortar and Concrete
ASTM D 75	(1987; R 1997) Sampling Aggregates

CORPS OF ENGINEERS (COE)

COE CRD-C 300	(1990) Specifications for Membrane-Forming Compounds for Curing Concrete
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1.3 GENERAL REQUIREMENTS

The Contractor shall be responsible for equipment, materials, testing, labor and other items and services required to accomplish the work. Equipment and techniques proposed for use in the work shall not be used until they have been demonstrated and approved. Materials and equipment which have not been approved for use in the work shall not be stored or brought on to Government property. The Contractor shall provide equipment, materials, and labor to demonstrate materials, equipment, and techniques proposed for use in the work. The demonstrations shall be performed at the site, at a time and location as directed. The demonstration shall include surface cleaning, surface patching (including finishing, texturing, and curing materials and methods), curing, safety procedures, surface finish and appearance. The Contractor's quality control shall conform to Section 01451 CONTRACTOR QUALITY CONTROL.

1.3.1 Concrete Mixture

The concrete mixture shall match that of the existing concrete to be repaired unless otherwise directed and shall be designed in accordance with ACI 211.1. The mixture proportions shall include consideration of the finishes required.

1.4 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

Proportions of Mixture; G WA

The results of trial mixture along with a statement giving the maximum nominal coarse aggregate size, aggregate grading, and the proportions of all ingredients that will be used in the manufacture of each strength of concrete, at least 14 days prior to commencing concrete placing operations. Aggregate quantities (by mass) shall be based on the saturated surface-dry condition. The statement shall include a complete petrographic analysis of the aggregate proposed for use in the concrete. The statement shall be accompanied by test results from an independent commercial testing laboratory, attesting that the proportions selected will produce concrete of the qualities indicated. No substitutions shall be made in the materials used in the work without additional tests to show that the quality of the concrete is satisfactory.

Qualifications

A statement certified by the Contractor attesting that the experience and qualification of the workers (journeymen) comply with the specifications.

SD-04 Samples

Materials; G WA

A minimum of 3 sample specimens for each proposed mixture at least 14 days prior to any placements, in order to demonstrate range of variation of each mixture. Samples of cured concrete and mortar patching specimens for each mixture shall be submitted for comparison with the cleaned structure. Samples of concrete and mortar shall be approximately 12 by 12 inches in plan dimension and 1 to 1-1/2 inches thick. The samples shall clearly indicate the mixture represented by the specimen, and shall have been produced, placed, finished, textured, and cured in the same manner as proposed for use in the work. The samples shall be checked for matches in color and shade, finish, texture, and surface defects. The samples shall be compared to that part of the structure on which the mixture is proposed to be used. The samples shall be compared to the thoroughly cleaned structure. The samples and structure surfaces shall be clean and completely dry during the comparison. Following the comparison to dry surfaces, the sample and structure shall be dampened with clean, potable water and the surfaces shall be compared for acceptability to the Contracting Officer.

SD-07 Certificates

Materials

Certificates of compliance attesting that the materials meet specification requirement.

1.5 QUALIFICATIONS

The Contractor shall provide qualified workers trained and experienced in restoration of concrete in historic structures for at least 5 consecutive years. A list of similar jobs shall be provided identifying when, where, and for whom the work was done.

1.6 EQUIPMENT

Equipment that is dependable and adequate to accomplish the specified work shall be assembled at the work site in sufficient time before the start of the work to permit thorough inspection, calibration of weighing and measuring devices, adjustment of parts, and the making of any repairs that may be required. The equipment shall be maintained in acceptable working condition during the life of the project.

1.6.1 Cleaning

Equipment used in cleaning shall not cause staining, erosion, marring, or other damage or changes in the appearance of the surfaces to be cleaned.

1.6.1.1 Water Blasting

Water blasting equipment shall include a trailer-mounted water tank, pumps, high-pressure hose, and with safety release cutoff control, nozzle, and auxiliary water re-supply equipment. The equipment shall not be operated at a pressure which will cause etching or other damage to the concrete surface. The equipment shall be operated at a discharge capacity of 55 psi to 500 psi and 2.5 to 3 gpm for general surface cleaning operations. The water tank and auxiliary re-supply equipment shall be of sufficient capacity to permit continuous operations. The Contractor shall provide protective covers and barriers as required to prevent over-spray onto adjacent surfaces.

1.6.2 Finishing and Texturing

Hand tools used for placing, finishing and texturing concrete and mortar shall be commercially available and commonly used in concrete construction and repair. Equipment used for finishing and texturing concrete and mortar surfaces shall be a type commonly used in the concrete construction and repair industry for that application. Surface grinders, impact tools, and other equipment shall conform to the requirements specified herein, except as specifically required by the type of finish and texture, and subject to approval.

1.6.3 Compressed Air Supplies

Compressed air shall provide clean, oil and moisture free compressed air at the surface to be cleaned. The compressed air line shall have at least two in-line air filters to remove oil and moisture from the air supply. The compressed air supply shall be tested during each shift for the presence of oil and moisture.

1.7 SAMPLING AND LABORATORY TESTING MATERIALS

Sampling and testing shall be performed by an approved independent commercial testing laboratory, or by the Contractor subject to approval. Should the Contractor elect to establish testing facilities, no work requiring testing shall be permitted until the Contractor's facilities have been inspected and approved. All sampling and testing shall be the Contractor's responsibility.

1.7.1 Existing Concrete Testing

Representative samples of existing concrete shall be taken from areas of the structure to be repaired at indicated locations. The samples shall be taken in accordance with ASTM C 42 and ASTM C 823 and tested in accordance with ASTM C 39, ASTM C 42, ASTM C 295, ASTM C 457, ASTM C 856, ASTM C 1218/C 1218M. Aggregates in the existing concrete shall be evaluated in accordance with ASTM C 136 and ASTM C 295. The air content of the existing concrete shall be determined in accordance with ASTM C 457 and ASTM C 642.

1.7.2 Acceptance of Cement

Cement for repair concrete and mortars shall be tested as prescribed in the referenced specifications under which it is furnished. Cement may be accepted on the basis of mill tests and the manufacturer's certification of compliance with the specification. The mill test reports and certification of compliance shall clearly reference the applicable ASTM documents and present the test result data. Cement shall conform to the specified requirements, and where the cement consists of a blend of cement and pozzolan, the pozzolan shall conform to the specified requirements for pozzolan, and the blend of cement and pozzolan shall conform to ASTM C 1107 and all other specified requirements.

1.7.3 Aggregate

Aggregate samples for repair concrete and mortars for laboratory testing shall be taken in conformance with ASTM D 75 and tested in accordance with ASTM C 33, ASTM C 136, and ASTM C 295.

1.7.4 Epoxy-Resin Grout

Epoxy-resin grout shall be tested for conformance with ASTM C 881.

1.8 SAMPLE PANELS

Sample panels of each mixture proposed for use in the work shall be submitted for approval. No concrete or mortar shall be used in the work until the samples and the represented mixture has been approved. Materials proposed for use in producing concrete and mortar shall not be brought on to Government property until the samples and mixtures have been approved. Samples for each side of the structure shall be evaluated both close up and at a distance under both wet and dry conditions. Each patch location and each side of the structure may require a separate or different mixture.

1.9 SPECIFIC REQUIREMENTS

1.9.1 Compressive Strength

Each class or mixture of concrete and mortar proposed for use in the work shall have a 28-day compressive strength matching the compressive strength of the adjacent existing concrete in the structure as determined by ASTM C 39 for concrete and ASTM C 109/C 109M for mortar. The compressive strength of the existing concrete shall be determined from testing of samples for each portion of the work in accordance with ASTM C 42. Test specimens of existing concrete shall be taken from a sound and intact representative portion of the structure, at locations indicated.

1.9.2 Admixtures

Concrete may contain admixtures, such as pigments, water reducers, high-range water reducers, or set retarders to provide special properties to the concrete. Use of admixtures shall be subject to approval.

1.9.3 Cementitious Content

Each class or mixture of concrete and mortar proposed for use in the work shall have a cement content matching the cement content of the adjacent existing concrete in order to provide uniform strength, weathering characteristics, and appearances of repaired surfaces in relation to existing surfaces.

1.10 PROPORTIONS OF MIXTURE

Trial batches shall contain materials proposed to be used in the project. Trial mixtures having proportions, consistencies and air content suitable for the work shall be made based on methodology described in ACI 211.1, using at least three different water/cement (w/c) ratios. Trial mixtures shall be proportioned to produce concrete matching the qualities specified.

In the case where ground granulated iron blast-furnace slag conforming to ASTM C 989 is used, the mass of the slag will be substituted in the equations for the term P which is used to denote the mass of pozzolan. Trial mixtures shall be designed for maximum permitted slump and air content. The concrete and mortar patching mixtures shall be designed using the lowest practical w/c ratio. The temperature, slump, and air content of the concrete and mortar mixtures in each trial batch shall be reported. For each w/c ratio at least three test specimens for each test age shall be made and cured in accordance with ASTM C 192/C 192M and ASTM C 109/C 109M. They shall be tested at 7 and 28 days in accordance with ASTM C 39 for concrete and ASTM C 109/C 109M for mortar. From these test results a curve shall be plotted showing the relationship between w/c ratio and strength. For each strength of concrete the maximum allowable w/c ratio shall be that shown by these curves to produce an average strength as specified in paragraph Average Strength. Materials, physical and chemical properties, and composition of concrete and mortar patch mixtures shall match the existing concrete to be repaired, except that patching mixtures shall have the lowest total chlorides content practical and shall conform to ACI recommendation for maximum permitted total chloride content.

1.11 STORAGE OF MATERIALS

Cement and pozzolan shall be stored in weathertight buildings, bins, or silos which will exclude moisture and contaminants. Cement shall be furnished in suitable bags used for packaging cements. Labeling of packages shall clearly define contents, manufacturer, batch identification, etc. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of aggregates. Reinforcing bars and accessories shall be stored in such a manner as to avoid contamination and deterioration. Admixtures which have been in storage at the project site for longer than six months or which have been subjected to freezing shall not be used unless retested and proven to meet the specified requirements. Epoxy shall be stored in accordance with the manufacturer's recommendations.

1.12 WEATHER LIMITATIONS

Concrete, mortar, and epoxy adhesives shall not be placed when weather conditions detrimentally affect the quality of the finished product. No concrete or mortar shall be placed when the air temperature is below 40 degrees F in the shade. When air temperature is likely to exceed 90 degrees F, concrete and mortar shall have a temperature not exceeding 90 degrees F when deposited, and the surface of the placed concrete shall be kept damp with a water fog until the approved curing medium is applied. Materials proposed for use in the work shall not be produced and placed during periods of rain or other precipitation. Material placements shall be stopped and all in-place material shall be protected from exposure during periods of rain or other precipitation.

PART 2 PRODUCTS

2.1 MATERIALS

Materials, physical and chemical properties, and composition of new concrete shall match that of existing concrete to be repaired, unless samples and testing determine that existing mixtures and materials are faulty or non-performing.

2.1.1 Admixtures

Air entraining admixtures shall conform to ASTM C 260, water-reducing or -retarding admixtures shall conform to ASTM C 494, and pigments for integrally colored concrete shall conform to ASTM C 979 and ASTM C 1017. Admixtures shall not contain added chlorides.

2.1.2 Aggregates

Aggregates shall match existing aggregates as determined by samples and testing and shall otherwise conform to ASTM C 33.

2.1.3 Bonding Agents

Bonding agents for use in bonding concrete and mortar patching materials to concrete and steel are specifically prohibited for use in the work.

2.1.4 Cementitious Materials

Cementitious materials shall each be of one type and from one source when used in concrete which will have surfaces exposed in the finished structure. Cementitious materials shall conform to one of the following:

2.1.4.1 Cement

Cement composition shall match that of cement used in existing concrete to be repaired as determined by samples and testing and shall conform to the basic requirements of ASTM C 150, Type I. Cement shall have non-shrink (shrinkage compensating) properties and shall conform to ASTM C 1107, Class B or C, expansive cement type.

2.1.4.2 Pozzolan

Pozzolan shall conform to ASTM C 618, Class F, including limit on available alkalis, "Table 2 - Supplementary Optional Chemical Requirements," and uniformity requirements, "Table 4 - Supplementary Optional Physical Requirements."

2.1.5 Epoxy Anchor Adhesives

An epoxy-resin grout shall be used to bond steel anchors to concrete, and shall be a 100 percent solids, moisture insensitive, low creep, structural adhesive. The epoxy shall conform to ASTM C 881, type IV; grade and class selected to conform to the manufacturer's recommendations for the application. The epoxy adhesive shall be conditioned, proportioned, mixed, and applied in accordance with the manufacturer's recommendations, except as otherwise specified herein or indicated on the drawings.

2.1.6 Water

Water used in cleaning concrete surfaces, used in producing concrete and mortars, and used for curing concrete shall be potable.

2.1.7 Curing Materials

2.1.7.1 Burlap

AASHTO M 182.

2.1.7.2 Impervious Sheets

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

2.1.7.3 Membrane-Forming Compounds

COE CRD-C 300, non-pigmented, containing a fugitive dye.

2.1.8 Joint Sealing

The Contractor shall use a polyurethane elastomeric sealant; grade NS,

Class 12.5, for no traffic use conforming to ASTM C 920. He shall ensure that the sealant color matches that of the cleaned cast stone.

2.1.9 Epoxy-Resin Grout

Epoxy-resin grout shall be a two-component material, 100 percent solids by weight, formulated to meet the requirements of ASTM C 881, Type I or II. Type I material shall be used when materials or atmospheric temperatures are 70 degrees F or above. Type II material shall be used when materials or atmospheric temperatures are below 70 degrees F. Epoxy-resin grout shall have the ability to structurally rebond cracks, delaminations, and hollow plane conditions in concrete; shall be insensitive to the presence of water; and shall have the capability to penetrate cracks down to 5 mils in width. Materials shall have been used in similar conditions for a period of at least five years.

PART 3 EXECUTION

3.1 EVALUATION AND ANALYSIS

Evaluation and analysis shall conform to the requirements specified herein, and the requirements specified in Section 01451 CONTRACTOR QUALITY CONTROL.

3.1.1 Existing Concrete

Concrete renovation shall be undertaken only after a complete evaluation and analysis of the areas to be repaired is completed. This shall include sampling and testing of the existing concrete to determine its composition and qualities. A condition survey of the area to be repaired shall conform to ACI 201.1R and ACI 364.1R. Strength evaluation shall be per ACI 437R. Cracks shall be evaluated per ACI 224.1R. Examination and sampling procedures shall conform to ASTM C 823.

3.2 PREPARATION OF CONCRETE SURFACES

3.2.1 Initial Surface Cleaning

The cleaning materials, equipment, and methods shall not result in staining, erosion, marring, or other damage to the surfaces of the structure. The materials, equipment, and methods proposed for use in cleaning shall be demonstrated in a 3 by 3 foot square test section. The location of the test section, and the completed test section shall be on the building where directed by the Contracting Officer. The cleaning process shall be adjusted as required and the test section rerun until an acceptable process is obtained. Following an initial inspection and evaluation of the structure and surfaces, the structure shall be given an initial surface cleaning. The initial surface cleaning shall be completed prior to start of repair work, and sampling and testing for mixtures. The initial cleaning procedure shall provide for the complete cleaning of all exterior concrete cast stone surfaces above elevation 175.85. The initial cleaning procedure shall thoroughly clean the concrete surface to remove all traces of moss, dirt, and other contaminants. The cleaning shall provide a clean concrete surface to allow determination of the concrete's color and shades, finish and texture, and other properties. The initial surface

washing shall consist of washing the surface with a clean, low pressure water (pressure of 55 psi to 500 psi and 2.5 to 3 gpm discharge) and manual surface scrubbing using handheld natural or plastic bristle brushes, followed by a clean water rinse. Following completion of the initial surface washing of the entire structure (or side of structure) the concrete shall be dried. A manual surface scrubbing with handheld natural or plastic bristle brushes shall be used on heavily soiled areas.

3.2.2 Areas to be Removed

Unsound, weak, or damaged concrete shall be removed. Loose particles, laitance, spalling, cracked, or debonded concrete and foreign materials shall be removed with hand tools unless otherwise noted. Surfaces of the structure, and surfaces adjacent to the excavation shall be protected from damage which may result from excavation, cleaning, and patching operations.

3.3 CONCRETE REPAIR

3.3.1 General Requisites

Repairs shall be accomplished in accordance with ACI Compilation 10, ACI Compilation 20, ACI 301, and ACI 304R. Cracks shall be repaired, if required, per ACI 224.1R. Detailing shall be per ACI 315. Repaired surfaces shall match adjacent existing surfaces in all respects. Formwork as necessary to reconstruct concrete to match adjacent surfaces shall be provided. Voids shall be filled flush with adjacent surfaces. Products shall be used in accordance with the manufacturer's instructions.

3.3.2 Spalls

Spalls less than 1 inch deep, where indicated to be repaired, shall be drypacked with an approved patching mortar. Spalls greater than 1 inch deep shall be excavated and patched with concrete.

3.3.3 Mixing Epoxy-Resin Grout Components

Epoxy-resin grout components shall be mixed in the proportions recommended by the manufacturer. The components shall be conditioned from 70 to 85 degrees F for 48 hours prior to mixing. The two epoxy components shall be mixed with a power-driven, explosion-proof stirring device in a metal or polyethylene container having a hemispherical bottom. The polysulfide curing agent component shall be added gradually to the epoxy-resin component with constant stirring until a uniform mixture is obtained. The rate of stirring shall be such that the entrained air is at a minimum.

3.3.3.1 Tools and Equipment

Tools and equipment used further in the work shall be thoroughly cleaned before the epoxy-resin grout sets.

3.3.3.2 Health and Safety Precautions

Full-face shields shall be provided for all mixing, blending, and placing operations as required. Protective coveralls and neoprene-coated gloves

shall be provided for all workers engaged in the operations. Protective creams of a suitable nature for the operation shall be supplied. Adequate fire protection shall be maintained at all mixing and placing operations. Smoking or the use of spark- or flame-producing devices shall be prohibited within 50 feet of mixing and placing operations. The mixing, placing, or storage of epoxy-resin grout or solvent shall be prohibited within 50 feet of any vehicle, equipment, aircraft, or machinery that could be damaged from fire or could ignite vapors from the material.

3.3.4 Application of Concrete and Patching Mortar

Concrete and mortar shall be placed to rebuild spalled or damaged areas to match the original surface finish, level, texture, and color. Concrete shall be cured as specified herein. The finished appearance of the patch shall match the adjacent existing surface.

3.4 CURING AND PROTECTION

Concrete and mortar patching shall be cured by an approved method for at least 7 days. Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, mechanical injury and injury from rain and flowing water. Air and forms in contact with concrete and mortar shall be maintained at a temperature above 50 degrees F for the first 3 days and at a temperature above 32 degrees F for the remainder of the specified curing period. Materials and equipment needed for adequate curing and protection shall be available and at the placement site prior to placing concrete and mortar. No fire or excessive heat shall be permitted near or in direct contact with the concrete and mortar at any time. Curing shall be accomplished by any of the following methods, or combination thereof, as approved:

3.4.1 Moist Curing

Concrete and mortar to be moist-cured shall be maintained continuously wet for the entire curing period. If water or curing materials stain or discolor concrete and mortar surfaces which are to be permanently exposed, the concrete and mortar surfaces shall be cleaned. Horizontal surfaces shall be cured by ponding, by covering with a 2 inch minimum thickness of continuously saturated sand, or by covering with waterproof paper, polyethylene sheet, polyethylene coated burlap, or saturated burlap.

3.4.2 Membrane Curing

Membrane curing shall not be used on surfaces that are to receive any subsequent treatment depending on adhesion or bonding to the concrete; except that a styrene acrylate or chlorinated rubber compound meeting COE CRD-C 300 requirements may be used for surfaces which are to be painted or are to receive bituminous roofing or waterproofing, or for floors that are to receive adhesive applications of resilient flooring. The curing compound selected shall be compatible with any subsequent paint, roofing, waterproofing, or flooring specified. Curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. Surfaces shall be thoroughly

moistened with water and the curing compound shall be applied to slab surfaces as soon as the bleeding water has disappeared, with the tops of joints being temporarily sealed to prevent entry of the compound and to prevent moisture loss during the curing period. Compound shall be applied in a one-coat continuous operation by mechanical spraying equipment, at a uniform coverage of 200 square feet per gallon. Concrete surfaces which have been subjected to rainfall within 3 hours after curing compound has been applied shall be resprayed by the method and at the coverage specified. Surfaces coated with curing compound shall be kept free of foot and vehicular traffic, and from other sources of abrasion and contamination during the curing period.

3.4.3 Epoxy Adhesives

Epoxy adhesives shall be protected and cured in accordance with the manufacturer's recommendations. The adjacent surfaces and ambient conditions shall be maintained within the manufacturer's recommendations. The patch anchors and epoxy adhesive shall be protected from displacement and disturbances.

3.5 CONCRETE AND MORTAR FINISHES AND COLOR

3.5.1 Matching Adjacent Concrete Cast Stone

Concrete and mortar finishes and color shall match the finish and color of the existing adjacent concrete cast stone. Finishing shall be accomplished at the time of concrete placement or immediately after formwork removal.

3.5.2 Non-Standard Finish

The exposed surfaces of concrete and mortar patching shall match the finish, texture, and surface detail of the original surface. Mechanical finishing and texturing may be required to produce the required finish and appearance. The finishing and texturing shall be accomplished in such a way as to help conceal bond lines between the patch and adjacent surfaces. The texturing shall provide replication of all surface details, including tooling and machine marks. The equipment used in finishing and texturing shall be a low-impact energy type which will not weaken the patch or damage the patch bond and the adjacent concrete. Equipment used for finishing and texturing shall be demonstrated on sample panels of concrete and mortar to demonstrate performance and suitability of the equipment and methods. Equipment and methods shall be subject to approval.

3.6 FINAL CLEANING

No sooner than 72 hours after completion of the curing period and after joints are sealed, faces and other exposed surfaces of concrete shall be washed down with water applied with a soft bristle brush, then rinsed with clean water. Discolorations which cannot be removed by these procedures, will be considered defective work. Cleaning work shall be done when temperature and humidity conditions are such that surfaces dry rapidly. Adjacent surfaces shall be protected from damage during cleaning operations.

3.7 SEALANT APPLICATION TO STONE JOINTS

The Contractor shall apply an elastomeric sealant to all open joints between cast stones above El. 175.85.

3.7.1 Surface Preparation

The surface of joints to receive sealant or caulk shall be free of all frost, condensation and moisture. Dirt, chalk, particles of mortar, dust, loose rust, loose mill scale, and other foreign substances shall be removed from surfaces of joints to be in contact with the sealant.

3.7.2 Application

Sealant shall be used before expiration of shelf life. Multi-component sealants shall be mixed according to manufacturer's printed instructions. Sealant in guns shall be applied with a nozzle of proper size to fit the width of joint. Joints shall be sealed as detailed in the drawings. Unless otherwise indicated, specified, or recommended by the manufacturer, the installed sealant shall be dry tooled to produce a uniformly smooth surface free of wrinkles and to ensure full adhesion to the sides of the joint; the use of solvents, soapy water, etc., will not be allowed. Sealants shall be installed free of air pockets, foreign embedded matter, ridges and sags. Sealer shall be applied over the sealant when and as specified by the sealant manufacturer.

3.8 PROTECTION OF WORK

Work shall be protected against damage from subsequent operations.

3.9 DEFECTIVE WORK

Defective work shall be repaired or replaced, as directed, using approved procedures.

3.10 FINAL INSPECTION

Following completion of the work, the structure shall be inspected for damage, staining, and other distresses. The patches shall be inspected for cracking, crazing, delamination, unsoundness, staining and other defects. The finish, texture, color and shade, and surface tolerances of the patches shall be inspected to verify that all requirements have been met. All surfaces exhibiting defects shall be repaired as directed.

-- End of Section --1

SECTION 06100

ROUGH CARPENTRY

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 INSTITUTE OF TIMBER CONSTRUCTION (AITC)

AITC 111 (1979) Recommended Practice for Protection of Structural Glued Laminated Timber During Transit, Storage and Erection

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 307 (2000) Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C9 (1997) Plywood - Preservative Treatment by Pressure Processes

AWPA M4 (1999) Standard for the Care of Preservative-Treated Wood Products

AWPA P5 (2000) Standards for Waterborne Preservatives

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA EWS R540C (1996) Builder Tips Proper Storage and Handling of Glulam Beams

APA PRP-108 (1980; Rev Jan 1996) Performance Standards and Policies for Structural-Use Panels

NATIONAL HARDWOOD LUMBER ASSOCIATION (NHLA)

NHLA Rules (1994) Rules for the Measurement & Inspection of Hardwood & Cypress

NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION (NELMA)

NELMA Grading Rules (1997) Standard Grading Rules for Northeastern Lumber

REDWOOD INSPECTION SERVICE (RIS)

RIS GCRL	(1997) Grades of California Redwood Lumber
SOUTHERN CYPRESS MANUFACTURERS ASSOCIATION (SCMA)	
SCMA Spec	(1986; Supple No. 1, Aug 1993) Standard Specifications for Grades of Southern Cypress
SOUTHERN PINE INSPECTION BUREAU (SPIB)	
SPIB Rules	(1994; Supple 8 thru 11) Standard Grading Rules for Southern Pine Lumber
U.S. DEPARTMENT OF COMMERCE (DOC)	
PS-1	(1995) Construction and Industrial Plywood
PS-2	(1993) Wood-Base Structural-Use Panels
WEST COAST LUMBER INSPECTION BUREAU (WCLIB)	
WCLIB 17	(1996; Supp. VII & VIII) Standard Grading and Dressing Rules for Douglas Fir, Western Hemlock, Western Red Cedar, White Fir, Sitka Spruce Lumber
WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)	
WWPA Grading Rules	(1999) Western Lumber Grading Rules 95

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-07 Certificates

Grading and Marking; G WA

Manufacturer's certificates (approved by an American Lumber Standards approved agency) attesting that lumber and material not normally grade marked meet the specified requirements. Certificate of Inspection for grade marked material by an American Lumber Standards Committee (ALSC) recognized inspection agency prior to shipment.

1.3 DELIVERY AND STORAGE

Materials shall be delivered to the site in undamaged condition, stored off ground in fully covered, well ventilated areas, and protected from extreme

changes in temperature and humidity. Laminated timber shall be handled and stored in accordance with AITC 111 or APA EWS R540C.

PART 2 PRODUCTS

2.1 LUMBER AND SHEATHING

2.1.1 Grading and Marking

2.1.1.1 Plywood and Other Sheathing Products

Materials shall bear the grademark or other identifying marks indicating grades of material and rules or standards under which produced, including requirements for qualifications and authority of the inspection organization. Except for plywood and wood structural panels, bundle marking will be permitted in lieu of marking each individual piece. Surfaces that are to be exposed to view shall not bear grademarks or other types of identifying marks.

2.1.2 Sizes

Lumber and material sizes shall conform to requirements of the rules or standards under which produced. Unless otherwise specified, lumber shall be surfaced on four sides. Unless otherwise specified, sizes indicated are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced.

2.1.3 Treatment

Exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWP A M4. Items of all-heart material of cedar, cypress, or redwood will not require preservative treatment, except when in direct contact with soil. Except as specified for all-heart material of the previously mentioned species, the following items shall be treated:

- a. Wood members in contact with or within 18 inches of soil.
- b. Wood members in contact with water.
- c. Wood members exposed to the weather and those used in roofing systems or as nailing strips or nailers over fiberboard or gypsum-board wall sheathing as a base for wood siding.
- d. Wood members set into concrete regardless of location, including flush-with-deck wood nailers for roofs.
- e. Wood members in contact with concrete that is in contact with soil or water or that is exposed to weather.

2.1.3.1 Plywood

Plywood shall be treated in accordance with AWP A C9 with waterborne preservatives listed in AWP A P5 to a retention level as follows:

- a. 0.25 pcf intended for above ground use.
- b. 0.40 pcf intended for ground contact and fresh water use.

2.1.4 Moisture Content

At the time lumber and other materials are delivered and when installed in the work their moisture content shall be as follows:

- a. Treated and Untreated Lumber Except Roof Planking: 4 inches or less, nominal thickness, 19 percent maximum. 5 inches or more, nominal thickness, 23 percent maximum in a 3 inch perimeter of the timber cross-section.
- b. Roof Planking: 15 percent maximum.
- c. Materials Other Than Lumber: In accordance with standard under which product is produced.

2.1.5 Sheathing

Sheathing shall be plywood.

2.1.5.1 Plywood

Plywood shall conform to PS-1, APA PRP-108 or PS-2, Grade C-D or sheathing grade with exterior glue. Sheathing for roof and walls without corner bracing of framing shall have a span rating of 16/0 or greater for supports 16 inches on center and a span rating of 24/0 or greater for supports 24 inches on center.

2.2 ACCESSORIES AND NAILS

Markings shall identify both the strength grade and the manufacturer. Accessories and nails shall conform to the following:

2.2.1 Anchor Bolts

ASTM A 307, size as indicated, complete with nuts and washers.

2.2.2 Bolts: Lag, Toggle, and Miscellaneous Bolts and Screws

Type, size, and finish best suited for intended use. Finish options include zinc compounds, cadmium, and aluminum paint impregnated finishes.

2.2.3 Expansion Shields

Type and size best suited for intended use.

PART 3 EXECUTION

3.1 INSTALLATION OF SHEATHING

3.1.1 Plywood and Wood Structural Panels

Sheathing shall be applied with edges 1/8 inch apart at side and end joints, and nailed at supported edges at 6 inches on center and at intermediate supports 12 inches on center unless otherwise shown. Nailing of edges shall be 3/8 inch from the edges. Roof sheathing shall be applied with long dimension at right angles to supports, end joints made over supports, and end joints staggered.

3.2 TABLES

TABLE I. SPECIES AND GRADE

Subflooring, Roof Sheathing, Wall Sheathing, Furring

Grading Rules	Species	Const Standard	No. 2 Comm	No. 2 Board Comm	No. 3 Comm
NHLA Rules	Cypress			X	
NELMA Grading Rules	Northern White Cedar				X
	Eastern White Pine	X			
	Northern Pine	X			
	Balsam Fir				X
	Eastern Hemlock- Tamarack				X
RIS GCRL	Redwood		X		
SCMA Spec	Cypress			X	
SPIB Rules	Southern Pine		X		
WCLIB 17	Douglas Fir-Larch	X			
	Hem-Fir	X			
	Sitka Spruce	X			
	Mountain Hemlock	X			
	Western Cedar	X			
WWPA Grading Rules	Douglas Fir-Larch	X			
	Hem-Fir	X			
	Idaho White Pine	X			
	Lodgepole Pine			X	
	Ponderosa Pine			X	
	Sugar Pine			X	
	Englemann Spruce			X	
	Douglas Fir South			X	
	Mountain Hemlock			X	
	Subalpine Fir			X	
	Western Cedar			X	

-- End of Section --

SECTION 07310

SLATE ROOFING

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 C 406 (1989; R 1996) Roofing Slate

ASTM D 226 (1997) Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)

NRCA R&W Manual (1996; Addenda Dec 1996; May 1998)) The NRCA Roofing and Waterproofing Manual

SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA Arch. Manual (1993; Errata; Addenda Oct 1997) Architectural Sheet Metal Manual

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-02 Shop Drawings

Drawings; G WA

Drawings showing slate installation and appearance details, flashing details, and nailing patterns for the slates.

SD-03 Product Data

Protection Plan; G WA

A plan showing how the Contractor intends to protect the ballasted EPDM membrane on the lower roofs from damage.

Qualifications; G WA

Documentation showing qualifications of personnel proposed to perform the roofing work, and a listing identifying prior installations completed by the Contractor.

SD-04 Samples

Slate; G WA
Accessories for Slate Roofs; G WA

Three representative shingles to show color range.

Sealants; G WA

8 ounces of each type.

Underlayment Membrane; G WA

1 by 1 foot section.

Fasteners; G WA

Representative samples of each fastener with identifying tags.

SD-07 Certificates

Materials

Certificates of compliance attesting that the materials meet specification requirements.

1.3 QUALIFICATIONS

The Contractor shall provide qualified workers, trained and experienced in installing slate roofing systems of this configuration, and shall submit documentation of 5 consecutive years of work of this type. The Contractor shall be familiar with and shall perform work in accordance with SMACNA Arch. Manual and NRCA R&W Manual. A list of installations made shall be provided, identifying when, where, and for whom the installations were made.

1.4 DELIVERY, STORAGE AND HANDLING

Materials shall be delivered in manufacturer's unopened bundles and containers with the manufacturer's brand and name marked clearly thereon. Shingles shall be stored in accordance with manufacturer's printed instructions. Roll goods shall be stored on end in an upright position. Immediately before laying, roofing felt shall be stored for 24 hours in an area maintained at a temperature not lower than 50 degrees F.

1.5 PROJECT/SITE CONDITIONS

1.5.1 Environmental Requirements

Slate roofing work shall proceed when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's

recommendations and warranty requirements.

1.5.2 Material Storage

Materials shall not be stored on roof decks in such a manner as to overstress and/or damage the deck and supporting structure. Placing of loads at midspans of framing shall be avoided. Superimposed loads shall be well distributed.

1.5.3 Units of Work

Units of work shall be established, including removal of existing materials, preparation of existing surfaces and application of underlayment and nailers, and related temporary and/or permanent flashing so that the unit of work can be completed prior to the end of each working day.

1.5.4 Temporary Protection Materials

Materials shall be provided and maintained on the site at all times for temporary roofing, flashing, and other protection when delays and/or changed weather conditions do not permit completion of each unit of work prior to the end of each working day. Materials which have been used for temporary roofing, flashing and other protection shall be removed and discarded.

1.6 WARRANTY

A warranty shall be furnished against defects in material and workmanship of slate roof assembly, including related metal flashing for a period of 10 years from date of final acceptance of the work.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Existing Slate

All existing slate shall be removed and replaced with new slate. The existing slate is a Vermont type in variegated shades of green and purple. New slate shall match the existing as closely as possible in size, pattern and color.

2.1.2 Slate

Slate shall conform to ASTM C 406. Slate shall be Grade A, (ASTM S1), hard, dense rock, punched or drilled for two nails each. Cracked slate shall not be used. Exposed corners shall be full. Broken corners on covered ends which sacrifice nailing strength or the laying of a watertight roof will not be allowed.

2.1.2.1 Standard Thickness Roofing Slate

Slate shall be smooth texture 3/16 to 1/4 inch thickness. Slate shall be the following sizes: 10" by 14".

2.1.2.2 Slate Colors

Slate shall be unfading slate. Color shall match that of the existing.

2.1.3 Underlayment Membrane

An underlayment membrane shall be furnished on all surfaces to be covered with slate. Membrane shall consist of asphalt-saturated felt.

2.1.3.1 Roofing Felt

Roofing felt shall be asphalt-saturated rag felt, Type II, No. 30 asphalt felt in accordance with ASTM D 226.

2.1.4 Nails

Nails shall be large-headed slater's solid copper nails of Number 10 or 11 gauge metal. Nails shall be 3d for slates 18 inch or less in length; 4d nails shall be used for slates 20 inch or longer, and 6d nails shall be used for slates on hips and ridges. Thicker slates require longer and heavier gauge nails. The proper size shall be determined by adding 1 inch to twice the thickness of the slate. Nails shall be of sufficient length to adequately penetrate the roof 1 1/4" nailing slab sheathing. Nails used to retain copper gutter lining and slate at rake edges, hips, ridges, and eaves prone to wind damage shall be of the ring shank design.

2.1.5 Sheathing

Plywood sheathing shall be provided and installed in accordance with the requirements as specified in Section 06100 ROUGH CARPENTRY. Alternatively, in lieu of plywood sheathing, the Contractor may attach the slates to 1" x 3" nominal wood laths spaced at 5 1/2" on center. Material for the wood lath shall be clear white pine, white oak or cedar.

2.1.6 Elastic Cement

Elastic cement shall be an approved brand of waterproof elastic slater's cement colored to match as nearly as possible the general color of the slate.

PART 3 EXECUTION

3.1 PROTECTION OF ROOF SURFACES

Equipment (such as padded ridge ladders) and techniques shall be used which prevent damage to roof as a result of foot or material traffic. Contractor shall be responsible for controlling breakage of new or existing slate beyond what is indicated. The progression of work shall be laid out and presented to the Contracting Officer to prevent other trades from working on or above completed roofing. Personnel who are working on the roof shall have proper shoes which will not further damage slates, and shoe soles shall be made of a material which will aid in preventing falls.

3.1.1 Protection Plan

The main (upper) Pumping Station roof is surrounded by other roofs at lower levels. Therefore, the Contractor shall take the necessary precautions to protect these roofs from any damage. The lower roofs have a ballasted EPDM membrane roof. Prior to working in the vicinity of these ballasted roofs, the Contractor shall submit a detailed plan for approval, that shows how he intends to protect the EPDM membrane from damage during all phases of construction. No mechanized equipment shall be driven or placed on any ballasted EPDM membraned roof.

3.2 PREPARATION OF SURFACES

Roof deck surfaces shall be smooth, clean, firm, dry, and free from loose large cracks, and projecting ends that might damage the roofing. Foreign particles shall be cleaned from interlocking areas to ensure proper seating and to prevent water damming. Prior to installation of slate, vents and other projections through roofs shall be properly flashed and secured in position, and projecting nails shall be driven firmly home.

3.3 ROOFING FELT

Felt shall be laid in horizontal layers with joints lapped toward eaves and at ends at least 2 inches, and secured along laps and at ends as necessary to hold the felt in place and protect the structure until covered with the slate. Felt shall be preserved unbroken, tight and whole. Felt shall lap hips and ridges at least 12 inches to form a double thickness and shall be lapped 2 inches over the metal of valleys or built-in gutters.

3.4 SLATING

3.4.1 Slate Coursing

The slate shall project 2 inches at the eaves and 1 inch at gable ends, and shall be laid in horizontal courses with 5 inch headlap (unless otherwise indicated), and each course shall break joints with the preceding one by at least 3 inches. Slates at the eaves or cornice line shall be doubled and canted 1/4 inch by a wooden cant strip, using same thickness slate for under-eaves at first exposed course. Under-eave slate shall be approximately 3 inches longer than exposure of first course. There shall be no through joints from the roof surface to the underlayment.

3.4.2 Nailing

Each slate shall be fastened with a minimum of two copper nails of sufficient length to penetrate the plywood sheathing at least 3/4 inch or through the decking thickness, whichever is less. The heads of slating nails shall just touch the slate and shall not be driven "home" or draw the slate, but left with the heads just clearing the slate so that the slate hangs on the nail. Nails in slates overlapping sheet metalwork shall not puncture the sheet metal. Exposed nails are permissible only in top courses where unavoidable. Exposed nail heads shall be covered with elastic cement. Hip slates and ridge slates shall be laid in elastic cement spread thickly over unexposed surface of under courses of slate,

nailed securely in place and pointed with elastic cement.

3.4.3 Ridges

Ridges shall be laid to form comb ridges. The nails of the combing slate shall pass through the joints of the slate below. The combing slate shall be laid with the same exposure as the next course down. Combing slates sloping away from the direction of the prevailing storms shall project 1 inch above the combing slate on the opposite side of ridge.

3.5 ACCESSORIES FOR SLATE ROOFS

3.5.1 Snow Guards

Nonferrous metal snow guards shall be provided over door entrances.

3.6 ROOF SLAB LOAD LIMITATIONS

The Contractor shall not overload the upper roof slab at any time. Roof materials shall be brought up as they are needed and shall not be stored on the roof surface. The maximum live load that can be placed on the upper roof or adjacent lower roof slabs is 30 psf. The maximum live load that can be placed on the ground level roofs slab is 80 psf.

-- End of Section --

SECTION 07625

COPPER SHEET METAL FLASHING

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 B 32	(1996) Solder Metal
ASTM B 152	(1997a) Copper Sheet, Strip, Plate, and Rolled Bar
ASTM B 370	(1998) Copper Sheet and Strip for Building Construction
ASTM C 1136	(1995) Flexible, Low Permeance Vapor Retarders for Thermal Insulation
ASTM D 226	(1997a) Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D 2822	(1991; R 1997e1) Asphalt Roof Cement
ASTM F 547	(1977; R 1995) Definitions of Terms Relating to Nails for Use with Wood and Wood-Based Materials

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-51145	(Rev C) Flux, Soldering, Non-Electronic, Paste and Liquid
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SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA Arch. Manual	(1993; Errata; Addenda Oct 1997) Architectural Sheet Metal Manual
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1.2 GENERAL REQUIREMENTS

Sheet metalwork shall be accomplished to form weathertight construction. Work shall be installed without waves, warps, buckles, fastening stresses or distortion and shall allow for expansion and contraction. Cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades shall be performed by

sheet metal mechanics. Exposed edges shall be hemmed. Bottom edges of exposed vertical surfaces shall be angled to form drips. Flashing at the end of a run shall be formed into a 3-dimensional configuration to direct water to the outside of the system. Weights and thicknesses of copper flashing shall be as specified in TABLE 1. Joints shall be installed as specified in TABLE 2. Accessories and other items essential to complete the sheet metal installation, though not specifically indicated or specified, shall be provided. Installation of sheet metal items used in conjunction with roofing shall be coordinated with roofing work to permit continuous roofing operations. Factory-fabricated components shall be packed in cartons marked with the manufacturer's name or trademark printed or embossed at frequent intervals to permit easy identification.

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-02 Shop Drawings

Sheet Metal; G WA

Drawings showing weights, gauges, or thickness of sheet metal; type of material; joining, expansion-joint spacing, and fabrication details; and installation procedures. Materials shall not be delivered to the site until after the approved detail drawings have been returned to the Contractor.

SD-03 Product Data

Contractor Quality Control;

Quality Assurance Plan, including a checklist of points to be observed, prior to start of roofing work.

SD-04 Samples

Materials; G WA

Samples of materials proposed for use, upon request.

1.4 DELIVERY, STORAGE, AND HANDLING

Materials shall be adequately packaged and protected during shipment and shall be inspected for damage, dampness, and wet-storage stains upon delivery to the jobsite. Materials shall be clearly labeled as to type and manufacturer. Sheet metal items shall be carefully handled to avoid damage. Materials shall be stored in dry, weathertight, ventilated areas until installation.

PART 2 PRODUCTS

2.1 MATERIALS

Materials shall conform to the requirements specified below, and those given in TABLE 1. Materials exposed to weather shall be copper.

2.1.1 Bituminous Cement

ASTM D 2822, Type I.

2.1.2 Fasteners

Materials shall conform to TABLE 1. Nails shall conform to ASTM F 547 or be as approved. Nails and rivets shall be copper. Screws and bolts shall be bronze. Fasteners shall be the best type for the application.

2.1.3 Felt

ASTM D 226, Type II.

2.1.4 Flux

CID A-A-51145, Type I.

2.1.5 Slip Sheet

Building paper meeting the requirements of ASTM C 1136, Type IV, style optional.

2.1.6 Sheet Metal

ASTM B 152, ASTM B 370, Light cold-rolled temper (H00) copper.

2.1.7 Solder

ASTM B 32 Sn50.

PART 3 EXECUTION

3.1 EXISTING COPPER SHEET METAL

The existing copper lining in the gutters and all downspouts shall be removed and replaced in-kind.

3.2 CAST STONE REPAIRS

3.2.1 General

The Contractor shall repair the cast stone on the places marked in drawings. The total volume for the repairs has been estimated in about 5 cubic foot.

3.2.2 Material Mix

A combination of epoxy resin binder and fine aggregate shall be used to repair damaged areas. Final dry mix shall match the existing cast stone in texture and color.

3.2.3 Submittals

The Contractor shall submit to the Government for approval the mix and/or components.

3.2.4 Weather Limitations

Apply epoxy resin grout only when the contact surfaces are completely dry and if the atmospheric and surface temperature ranges are suitable for the epoxy material. Follow manufacturer's instructions for weather conditions and temperature ranges.

3.2.5 Surface Preparation

Remove loose concrete from the damaged areas. Inspect the cavity for remaining defective concrete by tapping with a hammer or steel rod. Remove dust, dirt and loosely bonded material resulting from cleaning. Ensure cavity surfaces are dry.

3.2.6 Prime Dry Cavity Surfaces

Prime dry cavity surfaces with epoxy resin using a stiff bristle brush. Make coating approximately 20 mils thick. Place epoxy concrete while primer is still tacky and in layers not exceeding one inch thick. Use vibratory floats, plates, or hand tampers to consolidate the concrete. Level each layer and screed the final surface to match the adjoining surfaces. Remove excess epoxy concrete on adjacent surfaces before the concrete hardens. Do not feather epoxy out into adjacent surfaces.

3.3 SOLDERING AND SEAMING

3.3.1 Soldering

Edges of sheet metals, except lead coated material shall be pretinned before soldering is begun. Soldering shall be done slowly with well heated soldering irons to thoroughly heat the seams and completely sweat the solder through the full width of the seam. Edges of lead coated material to be soldered shall be scraped or wire-brushed to produce a bright surface, and seams shall have a liberal amount of flux brushed in before soldering is begun. Soldering shall follow immediately after application of the flux. Upon completion of soldering, the acid flux residue shall be thoroughly cleaned from the sheet metal with a solution of washing soda in water and rinsed with clean water.

3.3.2 Seams

Flat-lock and soldered-lap seams shall finish not less than 1 inch wide. Unsoldered plain-lap seams shall lap not less than 3 inches unless otherwise specified. Flat seams shall be made in the direction of the flow.

3.4 CLEATS

A continuous cleat shall be provided where indicated or specified to secure loose edges of the sheet metalwork. Butt joints shall be spaced approximately 1/8 inch apart. The cleat shall be fastened to the supporting construction with nails evenly spaced not over 12 inches on centers. Where the fastening is to be made to concrete or masonry, screws shall be used and shall be driven in expansion shields set in concrete or masonry. The cleat for fascia anchorage shall be installed to extend below the supporting construction to form a drip and to allow the flashing to be hooked over the lower edge at least 3/4 inch. The cleat shall be of sufficient width to provide adequate bearing area to ensure a rigid installation. Where horizontal nailer is vented for insulation and the cleat is placed over masonry or concrete, the cleat shall be installed over 1/16 inch thick metal washers placed at screws. Washers shall be of metal that is electrolytically compatible with the continuous cleat.

3.5 EXPANSION JOINTS

Expansion joints shall be provided at 40 foot intervals, except that where the distance between the last expansion joint and the end of the continuous run is more than half the required interval spacing, an additional joint shall be provided. Joints shall be evenly spaced.

3.6 FLASHINGS

3.6.1 General

Flashings shall be installed at intersections of roof with vertical surfaces and at projections through roof, except that flashing for heating and plumbing, including piping, roof, and floor drains, and for electrical conduit projections through roof or walls is covered in appropriate sections for such work. Cap flashings shall be turned around exterior corners of masonry or concrete walls at least 8 inches, shall be secured into masonry joints and into concrete with expansion anchors and shall be sealed with No. 2 or 4 sealing compound. Corner units shall have mitered joints, shall be installed with 3 inch lap joint over flashings on each side. Cap flashings shall be provided over base flashings. Perforations in flashings made by masonry anchors shall be covered up by an application of bituminous plastic cement at the perforation. Exposed and unfastened flashings shall have the edge of the strip turned under 1/2 inch. Flashing shall be installed on top of joint reinforcement.

3.6.2 Base Flashings

- (a) Base flashings shall extend under the uppermost row of tile the full depth of the tile or at least 4 inches over the tile immediately below the metal.
- (b) The base flashing shall be turned out 4 inches on the roof surface and from 6 to 8 inches on the vertical surface for either sloping or flat slate roofs.
- (c) Base flashings shall be used where posts, flagpoles, or scuttles

project through the roof. Vent pipes shall have base flashings in the form of special sleeves and/or EPDM boots.

3.6.3 Cap Flashings (Counterflashings)

Where the base flashing is not covered by vertical tile or siding, a cap flashing shall be built into the masonry joints lapping not less than 2 inches vertically, extending down over the base flashing 4 inches, and the edge bent back and up 1/2 inch.

3.6.4 Eave and Rake Flashings

Eave and rake flashings shall be placed in accordance with SMACNA Arch. Manual.

3.7 REGLETS

Reglets shall be a factory fabricated product, complete with fittings and special shapes as may be required. Open-type reglets shall be filled with fiberboard or other suitable separator to prevent crushing of the slot during installation. Reglets shall be located not less than 8 inches nor more than 16 inches above roofing not having cant strips or shall be located not less than 5 inches nor more than 13 inches above cant strip. Reglet plugs shall be spaced not over 12 inches on centers and reglet grooves shall be filled with sealant. Friction or slot-type reglets shall have metal flashings inserted the full depth of slot and shall be lightly punched every 12 inches to crimp the reglet and cap flashing together.

3.8 DOWNSPOUTS

Downspouts shall be set plumb and not less than 1 inch from the wall. Leaders shall connect gutters on overhanging eaves to downspouts. Leaders shall be set with a slope not less than 0.3 degrees, 1/16 inch per foot or more than 30 degrees below a horizontal line. Leaders shall fit over the outlet tube in gutter bottom and shall fit into and be riveted to the downspout. Rivet spacing shall be not more than 2 inches. Strainers shall be set loosely in the eave tube opening in gutter. Joints between lengths of downspouts shall be made by telescoping the end of the upper lengths at least 3/4 inch into the lower length. Downspouts terminating in drainage lines shall be neatly fitted into downspout boots and the joint filled with a portland cement mortar cap sloped away from downspout. Downspouts terminating at splash blocks or splash pans shall be provided with stock elbow-type fittings. Downspout hangers shall be provided adjacent to the joint at the top of each section of downspout, except that the bottom section shall have an additional strap adjacent to the bottom joint when splash blocks or splash pans are required. Hangers shall be 1/16 x 1 inch flat stock of the same material as the downspout.

3.9 GUTTERS

All built-in gutters shall be lined with 32-ounce cold-rolled copper as shown on the drawings. The lining shall be formed of sheets not more than 8 feet in length. The ends shall be joined by 1-1/2-inch lapped, riveted, and soldered cross seams. Rivets shall be of 3/16-inch copper and spaced

not more than 2-inches on centers. Copper burrs shall be provided under rivet heads.

3.9.1 Gutter Lining

The roof edge of the gutter lining shall be secured to the roof deck with 2-inch wide copper cleats spaced 2 feet apart. The roof edge shall extend under the slate roof not less than 6-inches and shall terminate in a folded edge at the bottom.

3.9.2 Outside Member

The outside member of the gutter lining shall be of 24-ounce lead-coated copper locked to the copper lining and secured in stone with lead plugs and the joint completely filled with compacted lead wool.

3.9.3 Expansion Joints

Expansion joints in the built-in gutters shall be provided midway between the drains and where the ends of gutters abut masonry walls. The ends of each gutter section shall be closed with vertical pieces, flanged, riveted, and soldered to the lining. The top edges shall have horizontal flanges at least one-inch wide and shall be not lower in height than the outside edge of the gutter. There shall be an open space not less than one-inch wide between vertical pieces to permit full movement of the lining. Cover strips of 16-ounce copper shall be loose locked into the flanges of the gutter ends with sufficient play to permit full movement of the gutter in either direction. Where the gutter ends abut masonry, cover strips shall extend up and under cap flashings built into the masonry.

3.9.4 Outlets

Outlets shall be provided in the lining for the roof drains. Connections to roof drains shall be made in strict accordance with the manufacturer's directions.

3.10 TEST OF ROOF DRAINS

On completion of the gutter and roof drain replacement work, the Contractor shall conduct a test of each roof drain. Using a water hose, he shall place an adequate amount of water in the gutters and other applicable areas. Then, in the presence of the Contracting Officer, he shall unplug the drains allowing the water to freely flow down the gutters. If any impediment to flow is observed in the roof drain, the Contractor shall unclog it at no additional cost to the Government.

3.11 CONTRACTOR QUALITY CONTROL

The Contractor shall establish and maintain a quality control procedure for sheet metal used in conjunction with roofing to assure compliance of the installed sheet metalwork with the contract requirements. Any work found not to be in compliance with the contract shall be promptly removed and replaced or corrected in an approved manner. Quality control shall include, but not be limited to, the following:

- a. Observation of environmental conditions; number and skill level of sheet metal workers; condition of substrate.
- b. Verification of compliance of materials before, during, and after installation.
- c. Inspection of sheet metalwork, for proper size and thickness, fastening and joining, and proper installation.

The actual quality control observations and inspections shall be documented and a copy of the documentation furnished to the Contracting Officer at the end of each day.

TABLE 1 - COPPER SHEET METAL WEIGHTS AND THICKNESSES

Item Description	Copper, ounces per square foot
Building expansion joints:	
Cap	16
Waterstop - bellows or flanged- U-type	16
Cleats (Continuous)	24
Covering on minor flat, pitched or curved surfaces	20
Downspouts, heads and leaders	16
Flashings:	
Base	32
Cap, stepped or valley	32
Gravel stops and fasciae:	
Sheets, corrugated	16
Gutters (girth):	
Up to 380 mm	16
380 to 510 mm	16
510 to 635 mm	20
635 to 760 mm	24
Gutter brackets (girth):	
Up to 380 mm	1/8 x 1 inch

TABLE 1 - COPPER SHEET METAL WEIGHTS AND THICKNESSES

Item Description	Copper, ounces per square foot
380 to 510 mm	1/4 x 1 inch
510 to 610 mm	1/4 x 1 1/2 inch
Gutter cleats and cover plates	16
Scupper lining	32
Gutters lining	32
Strainers (wire gauge)	No.9
Reglets(1)	10
Splash pans	16
Copings	32
Pitch pockets	16
Through-wall, flashings above roof line	16
Through-wall, below roof line, except as otherwise specified in paragraph	16
MATERIALS	10

TABLE 2 - COPPER SHEET METAL JOINTS

Item Designation	Type of Joint
Building expansion joint at roof	1-1/4 inch single lock standing seam, cleated.
Cleats (Continuous)	Butt
Flashings:	

TABLE 2 - COPPER SHEET METAL JOINTS

Item Designation Base	Type of Joint
	1 inch flat locked, soldered.
	3 inch lap for expansion joint.
Cap-in reglet	3 inch lap.
Cap - two- piece	Receiver 3 inch lap. Cap piece 3 inch lap.
Stepped	3 inch lap.
Through-wall spandrel flashing (metal)	1 1/2 inch mechanical interlock.
Valley corrugated	6 inch lap, cleated. Sheet, Butt with 1/4 inch space. Sheet, Butt with 1/4 inch space.
smooth Gutters	1 1/2 inch lap, riveted and soldered.
Pitch pockets	1 inch soldered lap.
Reglets	Butt joint.

-- End of Section --