DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
P.O. BOX 889
SAVANNAH, GEORGIA 31402-0889

REPLY TO
ATTENTION OF:

August 24, 2004

Contracting Division
A-E and Construction Branch

SUBJECT: DACA21-03-D-0015, Multiple Award Task Order Contract Construction and Design/Build for North Carolina (and SAD)

TMS Contracting, LLC
635 Frosty Morn Drive
Clarksville, Tennessee 37040

Gentlemen:

You are requested to submit a price proposal for work detailed in the scope of work, drawings and specifications posted on our website. The Task Order Request Number is TONC15-03-D-0015. The title of the task order is Interior Renovations for Building E-2929, Fort Bragg, North Carolina. The period of performance is 180 calendar days. Liquidated damages are $747.53 per day.

This is a high priority requirement as defined in Army Federal Acquisition Regulation – AFAR Supplement 5101.602-2. Subject to availability of funds, the accounting classification will be: 21 4 2050 408 8021 P7000 3220 S09133. This project is also included in the financial plan for FY-05 at which time the accounting classification will be 21 5 2050 508 8021 P7000 3220 S09133. This statement is not a commitment of funds. Funds are not presently available for this acquisition. No contract award will be made until appropriated funds are made available from which payment for contract purposes can be made.

You are reminded that this project is being completed among your firm, The Clement Group, and GSC Contruction. Award will be made based on price.

To access the scope of work and specifications, and drawings go to http://ebs.sas.usce.army.mil. Scroll down the page to you come to the "blue" label that reads Construction – Simplified Acquisition. Select the project Number pertaining to your Solicitation/Contract TONC15-03-D-0015.

Your proposal should be signed by a duly authorized official of your company and is required no later than 2:00 P.M. local time September 21, 2004 to the above address ATTN: CT-C/Linda Elliott.

If you have any questions, please contact Linda Elliott at (912) 652-5076 or Glynn Richards at (912) 652-5659.

Sincerely,

Julie A. Anderson

Julie A. Anderson
Contracting Officer

Enclosures

SCOPE OF WORK
REVISED 14 SEPTEMBER 2004

Interior Renovations for Building E-2929
MB00024-4P
Fort Bragg, NC

1. **DESCRIPTION OF WORK:** Furnish all labor, equipment, incidentals, supervision, and transportation for work necessary to renovate the interior of Building E-2929. All work shall be performed in accordance with the MATOC contract specifications, manufacturer's recommendations, and state building codes. All work shall comply with the Uniform Building Code, Life Safety Code, National Standard Plumbing Code, and manufacturer's recommended practices. All electric work shall comply with NFPA 70, National Electric Code and NFPA 13 and 101, Life Safety Code and manufacturer's recommendations.

2. **PERFORMANCE PERIOD:** ~~180~~240calendar days

3. **CONTRACTOR REQUIREMENTS:**

   A. Project Involves Handling of Asbestos: No

   B. Occupancy During Construction: Yes.

   C. Phasing of Work: Yes, per Specification Section 01005-3.3.3: "Contractor is to furnish a detailed construction phasing plan and schedule."

   D. Construction Schedule: Bar Chart

   E. CQC System Requirements: CQC Organization, CQC System Manager, and Civil per 01451A-3.4.3.

4. **PRE-BID CONFERENCE:** Yes

Date:	Time:	Location:	POC/Telephone:
01 SEP 04	1300	ON-SITE	VERNON CRUDUP/(910) 432-8121

5. **CONTRACT REQUIREMENTS:**

   A. After task order award:
   FRP0001 - Site Safety and Health Plan
   FRP0002 - Quality Control Program
   FRP0003 - Work Plan (Design)
   FRP0004 – Price Proposal
   FRP0005 - Pre-Remediation Action Conference
   FRP0006 - Work Schedule
   FRP0007 - Weekly Progress Report
   FRP0008 - Telephone Conversation/Correspondence Records
   FRP0015 – Site/Project Specific Remediation Report
   FRP0016 - As-Built/In Progress Drawings

   B. After construction completion, prior to final payment:

FRP0009 - System/Equipment Testing
FRP0010 - Operation and Maintenance Manuals to include Videos
FRP0011 - Training
FRP0012 - Equipment and Construction Warranties
FRP0013 - List of Standard Equipment and Service Organizations
FRP0014 - Certification of Computer Media
FRP0017 - As-Built/Final Drawings

6. GOVERNMENT FURNISHED ITEMS/WORK: N/A

7. INTERFACE WITH GOVERNMENT PERSONNEL: Access to and from the site shall be coordinated through the NC Air Force and Special Operations Resident Office, ATTN: Mr. Vernon Crudup. The phone number is (910) 432-8121

8. WAGE DETERMINATION: General Decision # NC030032, dated 06/13/2003, NC32 ~ Building.

9. LIQUIDATED DAMAGES: The contractor shall be assessed the amount of $747.53 liquidated damages per calendar day for failure to complete the prescribed work within the performance period stated in paragraph 2, above.

10. TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	0	0	0	0	0	0	0	0	0

11. PAYMENT OFFICE:

The billing and payment will be through the Corps of Engineers NC Special Projects Resident Office:

US Army Corps of Engineers
NC Special Projects Resident Office
ATTN: CESAS-CD-PSS
Bldg. 8-2804, Scott Street
Ft. Bragg, NC 28307-0247

12. ENCLOSURES:

A. Specifications: 250 pages.

B. Drawings: 50 sheets (estimated)

C. General Work: Refer to Section 010050 of the Contract Specifications.

D. Architectural Work: Refer to Section 010050 of the Contract Specifications.

E. Mechanical Work: Refer to Section 010050 of the Contract Specifications.

F. Electrical Work: Refer to Section 010050 of the Contract Specifications.

G. Landscaping and Grounds Restoration Work: N/A.

13. PRE BID SITE VISIT: Prior to the submission of any bids, all bidders are required to visit the project site location to become familiar with the project requirements. Failure to visit the project site will not disqualify a bid; however, the bidder is required to comply with the terms and conditions of any resultant contract because of such failure. In no event will a failure to inspect the site constitute grounds for a claim after award of the task order.

14. EXCAVATION PERMIT: The contractor shall have a completed and approved PWBC Excavation Permit prior to any excavation, to include sign or fence-post holes. The Contractor shall schedule an appointment to locate utility lines at least 24 hours prior to any excavation with the PWBC Facilities Maintenance Division. A copy of the PWBC Excavation Permit will be provided at the Prework Conference. The Contractor shall be responsible for coordination with the Information Technology Business Center (ITBC), Outside Plant Branch, for locating communication lines prior to any excavation.

15. DISPOSAL AND BORROW PERMITS:

a. Disposal Permits: A permit is required to use the installation land clearing and inert debris and demolition landfills. Landfill permits shall be processed with the Environmental Compliance Branch of the PWBC Environmental & Natural Resources Division. Permits are issued for the life of the specific contract only. Only materials produced on the project for which the permits are issued may be disposed of in the land clearing and inert debris and demolition landfills. The Contractor shall keep a copy of the completed permit with the vehicle throughout the contract disposal operation. Copies of the disposal permit forms will be provided at the Prework Conference.

b. Borrow Permits: A permit is required to use the Fort Bragg borrow material pits. Borrow pit permits shall be processed with the Environmental Compliance Branch of the PWBC Environmental & Natural Resources Division. Permits are issued for the life of the specific contract only. Borrow materials may only be used on the project for which the permits are issued. The Contractor shall keep a copy of the completed permit with the vehicle throughout the contract borrow operation

16. HAUL ROUTES: The Contractor is required to obtain approval from the Resident Office for the routes he intends to use for transportation of borrow materials, construction debris, or demolition materials unless otherwise permitted in writing by the Resident. The axle load of earth-hauling equipment operating on paved streets shall not exceed 12,000 pounds.

17. UTILITY OUTAGES AND ROAD CLOSURES: Utility, road, and railroad closures require a minimum 10 working days advance written notice and will be subject to Resident

Office approval. In the case of a road closures, a sketch shall be provided showing the closure location and all necessary signs and barricades. Necessary signage, barricades, flag persons, lights (including temporary traffic control lights), and markings for the safe movement of the public during construction shall be in accordance with the Manual on Uniform Traffic Control Devices, and shall be provided at no additional expense to the Government.

18. AVAILABILITY AND USE OF UTILITY SERVICES: Utility services required on the job site for the accomplishment of the work will be furnished at no cost to the Contractor; however, the Government will make no connections or alterations to the existing utility systems for the Contractor. Utilities for offices and/or storage buildings or areas will be billed to the Contractor monthly and will not be furnished free of charge. The Contractor shall be responsible for installing meters or other connections at no cost to the Government. At the conclusion of the contract, the Contractor shall remove all temporary connections, distribution lines, meters and associated paraphernalia unless otherwise directed by the Resident Office. Prior to installing any utility connections at an office/storage site, the plan will be approved by the Resident Office. When utility meters are installed, the Contractor shall notify the Resident Office for the initial meter reading. Failure to obtain this initial reading will result in the Contractor being charged for the entire amount shown on the meter.

19. CONTRACTOR STORAGE AND TRAILERS: The Contractor shall place or paint a sign on all of his storage trailer(s) and building(s) used on this contract. At a minimum, the sign shall contain the name of the Contractor and a telephone number at which the contractor can be reached. The trailer(s) and building(s) shall be completed with gates and/or doors, which can be locked. Only material for this project shall be stored in the trailer(s) or building(s). The Contractor shall remove the storage trailer(s) or building(s) within 30 days after completion of the contract and prior to submitting his final invoice. The area around the storage trailer(s) and building(s) shall be kept clean.

20. SAFETY: Safety will be incompliance with the Corps of Engineers Safety Manual EM 385-1-1 (Nov. 2003 edition). Use of appropriate safety equipment is mandatory and not limited to hard hats and steel-toed shoes. Contractor is responsible for daily clean up and complete restoration of the area once the contract is complete.

21. HOURS OF WORK: Work shall be accomplished between the hours of 0730 thru 1630 hours daily, Monday through Friday on non-Government holidays. Legal holidays falling on Saturday are observed on the proceeding Friday and those falling on Sunday are observed on the following Monday. Work schedule and facility security to be coordinated with the Resident Office for facility access and security maintenance during duration of work. Contractor shall not work outside of the stated hours of work, without first obtaining approval from the Resident Office.

22. WARRANTY: The contractor shall provide a minimum of one (1) year warranty on all materials and workmanship from the date of the Government's acceptance of the work.

END OF SCOPE

SUPPLIES OR SERVICES AND PRICES/COSTS
SCHEDULE

MB-00024-4, INTERIOR RENOVATIONS FOR BLDG. E-2929
FORT BRAGG, NC

TOTAL BID ITEM 0001----------$_____ . _____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	BASE BID	1.00	Lump Sum	XXXX	$_____
	Repair and Renovation of Interior Finishes in Lobbies and Main Corridors On All Floors, approximately (12,400 SF), Complete				

General Decision Number NC030032 06/13/2003 NC32

Superseded General Decision No. NC020032

State: North Carolina

Construction Type:
BUILDING

County(ies):
CUMBERLAND

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories).

Modification Number	Publication Date
0	06/13/2003

COUNTY(ies):
CUMBERLAND

SUNC1027A 10/24/1994

	Rates	Fringes
BRICKLAYERS/BLOCKLAYERS	12.50	
CARPENTERS (Including drywall hanging, acoustical tile installation and batt insulation	9.08	
CEMENT MASONS/CONCRETE FINISHERS	8.43	
ELECTRICIANS	9.71	
GLAZIERS	8.77	
HVAC MECHANIC (HVAC pipe only)	9.26	
INSULATORS (pipe)	10.42	.63
IRONWORKERS, STRUCTURAL	10.76	
LABORERS:		
Unskilled	6.23	
PAINTERS (Brush)	7.90	.04
PLUMBERS	10.28	
ROOFERS	6.75	
SHEET METAL WORKERS (Including HVAC Duct Work)	9.36	
SOFT FLOOR LAYERS/CARPET LAYERS	12.00	
TRUCK DRIVERS	7.10	

WELDERS - receive rate prescribed for craft performing operation to which welding is incidential.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively

bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

PROJECT TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01005 GENERAL AND SPECIAL PROVISIONS
01330 SUBMITTAL PROCEDURES
01451A CONTRACTOR QUALITY CONTROL

DIVISION 05 - METALS

05586 METAL COLUMN COVERS

DIVISION 06 - WOOD AND PLASTICS

06405 WOOD CUBE SUSPENDED CEILING SYSTEMS
06420 PANELING

DIVISION 08 - DOORS AND WINDOWS

08110 STEEL DOORS AND FRAMES
08120 ALUMINUM DOORS AND FRAMES
08210 WOOD DOORS
08710 DOOR HARDWARE
08800 GLAZING

DIVISION 09 - FINISHES

09000 BUILDING COLOR AND FINISH SCHEDULE
09100N METAL SUPPORT ASSEMBLIES
09250 GYPSUM BOARD
09720 WALLCOVERINGS
09775 VERTICAL SURFACING PANEL SYSTEM
09809 MULTI-COLOR INTERIOR COATING
09900 PAINTS AND COATINGS

DIVISION 10 - SPECIALTIES

10260 WALL AND CORNER GUARDS

DIVISION 16 - ELECTRICAL

16415A ELECTRICAL WORK, INTERIOR

-- End of Project Table of Contents --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01005

GENERAL AND SPECIAL PROVISIONS

PART 1 SCOPE OF WORK

1.1 Asbestos Abatement
1.2 Building Demolition
1.3 Civil Work
1.4 Architectural Work
1.5 Mechanical Work
1.6 Electrical Work

PART 2 PROJECT REQUIREMENTS

2.1 Certificates of Compliance and Material Submittals
2.2 Omitted
2.3 Quality Control
2.4 Omitted
2.5 Disposal
2.5.1 Disposal Permits
2.6 Haul Routes
2.7 Utility Outages and Road Closures
2.8 Availability and Use of Utility Services
2.9 As-Built Record Drawings
2.9.1 Master Prints
2.9.2 Certification

PART 3 SPECIAL PROVISIONS:

3.1 Occupancy
3.2 Contractor Vehicle/Equipment Access to Fort Bragg
3.3 Special Work Constraints
3.3.1 Time Constraints
3.3.2 Phasing Requirements
3.3.3 Security Requirements

-- End of Section Table of Contents --

SECTION 01005

GENERAL AND SPECIAL PROVISIONS

PART 1 SCOPE OF WORK

1.1 Asbestos Abatement

None.

1.2 Building Demolition

Building demolition as required for the renovation of building.

1.3 Civil Work

None.

1.4 Architectural Work

Provide renovation of building as noted on drawings.

1.5 Mechanical Work

None.

1.6 Electrical Work

Provide fluorescent and metal halide lighting fixtures, power receptacles, power and starter motors as applicable for special outlets/disconnects heating, ventilating, air conditioning equipment and other mechanical equipment and all other power system requirements noted on drawings.

PART 2 PROJECT REQUIREMENTS

2.1 Certificates of Compliance and Material Submittals

The Contractor shall submit for approval all certificates of compliance and material submittals required in these technical provisions. Required submittals shall be submitted for approval not later than 30 days prior to the approval date needed to achieve compliance with the approved project schedule. Approval must be received from the Contracting Officer or his representative before incorporating the materials into the work. The Contractor shall provide a Submittal Control Sheet listing all required submittal forms (form 59-2-R) and a sample Submittal Register (Form 4288) will be provided at the Prework Conference.

2.2 Omitted

2.3 Quality Control

The Contractor shall provide the job superintendent's name and telephone number to the Construction Management Division of the PWBC; Building 3-1933, Butner Road; (910) 396-2308, prior to commencement of work. The Contractor shall furnish a daily Contract Quality Control (CQC)/Superintendent's work report to the Contracting Officer's Representative (COR). A sample CQC report form will be provided at the Prework Conference.

2.4 Omitted

2.5 Disposal

2.5.1 Disposal Permits

A permit is required to use the installation land clearing and inert debris and demolition landfills. Landfill permits shall be processed with the Environmental Compliance Branch of PWBC Environmental & Natural Resources Division; Building 3-1333, Butner Road; (910) 432-6336/6352. Permits are issued for 60 days duration and for the specific contract only. Only materials produced on the project for which the permits are issued may be disposed of in the land clearing and inert debris and demolition landfills. The Contractor shall keep a copy of the complete permit with the vehicle throughout the contract disposal operation. Copies of the disposal permit forms will be provided at the Prework Conference. The land clearing and inert debris and demolition debris disposal site locations are shown on the drawings.

2.6 Haul Routes

The Contractor is required to use the haul routes shown on the contract drawings for transportation of borrow materials, construction debris, or demolition materials unless otherwise permitted in writing by the COR. When haul routes are not designated in the contract, the Contractor must obtain approval from the COR for the routes he intends to use. The axle load of earth-hauling equipment operating on paved streets shall not exceed 12,000 pounds.

2.7 Utility Outages and Road Closures

Utility, road, and railroad closures require minimum 10 working days advance written notice and will be subject to COR approval. A sample utility outage/road closure request form will be provided at the Prework Conference. In the case of road closures, a sketch shall be provided showing the closure location and all necessary signs and barricades. Necessary signage, barricades, flagpersons, lights (including temporary traffic control lights), and markings for the safe movement of the public during construction shall be in accordance with the Manual on Uniform Traffic Control Devices, and shall be provided at no additional expense to the Government.

2.8 Availability and Use of Utility Services

Utility services required on the job site for the accomplishment of the work will be furnished at no cost to the Contractor, however, the Government will make no connections or alterations to the existing utility systems for the Contractor. Utilities for offices and/or storage buildings or areas will be billed to the Contractor monthly and will not be furnished free of charge. The Contractor shall be responsible for installing meters or other connections at no cost to the Government. At the conclusion of the contract, the Contractor shall remove all temporary connections, distribution lines, meters and associated paraphernalia unless otherwise directed by the Contracting Officer or his representative. Prior to installing any utility connections at an office/storage site, the plan will be approved by the COR. When utility meters are installed, the Contractor shall notify the (COR) for the initial meter reading. Failure to obtain this initial reading will result in the Contractor being charged for the

entire amount on the meter.

2.9 As-Built Record Drawings

2.9.1 Master Prints

The Contractor shall be responsible for maintaining one set of master prints at the job-site on which he shall keep a careful and neat record of all deviations from the original contract drawings as the work progresses. The Contractor shall note all changes and corrections on these record drawings shall also include the actual location of all subsurface utility lines installed or encountered, and the type of materials used.

2.9.2 Certification

These marked-up/annotated prints shall be converted to digital format and shall be certified as to their correctness by the signature of an authorized representative of the Contractor prior to submission. They shall be turned-over to the COR per Specification Section 01780A not later than 10 days after acceptance of the work by the Government.

PART 3 SPECIAL PROVISIONS:

3.1 Occupancy

The facility will be occupied and in normal usage during accomplishment of the work. Interference with and inconvenience to the occupants or routine use of the facility shall be held to an absolute minimum. The Contractor is responsible for providing such covering, shields, and barricades as are required to protect the facility occupants, furniture , equipment, supplies, etc., from dust, debris, weather intrusion, or other cause of damage resulting from construction.

3.2 Contractor Vehicle/Equipment Access to Fort Bragg

Fort Bragg is not a closed installation, but vehicular access is controlled. Contractors are required to register each vehicle that will be traveling installation roads or streets under its own power. Each such vehicle shall have a registration decal. Registration may be accomplished at the Main Vehicle Registration Center, building 8-1078 on Randolph Street near Bragg Boulevard, 0800-1700 hours Monday through Friday. Unregistered vehicles should expect to be stopped and delayed at all access control points Contractor sand all commercially registered vehicles shall use the Knox Street access control point off Bragg Boulevard for all access to fort Bragg.

3.3 Special Work Constraints

3.3.1 Time Constraints

Work is to be completed between the hours of 7:30 AM to ~~5:00~~4:30 PM, Monday thru Friday, no Government holidays, unless special arrangements are made/approved with the Contracting Officer,. After hour and weekend work requires 2 working days notice for approval. Work may be terminated at any time for special closure of the site.

3.3.2 Phasing Requirements

Work will be phased as indicated in drawings.

3.3.3 Security Requirements

See attached policy numbers P22-00, P14-01, P25-0l and P22-92.

-- End of Section --

POLICY OR PRECEDENT

SUBJECT:

Access to Building E-2929 by Contractor Personnel 13 Dec 00

POLICY NUMBER	ORIGINATING SECTION	ORIGINATOR	PHONE #
22-00	AOIN-SE	M. Sutherlin	2-8165

/s/
APPROVED BY: ANDREW A. ANGELACCI, COL, GS, Chief of Staff

SYNOPSIS:

1. PURPOSE: To establish policy regarding access to the United States Army Special Operations Command Headquarters building by visiting contractor personnel.

2. SCOPE: This policy applies to all USASOC Directorates, Special Staff Sections, and Major Subordinate Commands (MSCs)in headquarters Building E2929.

3. RESPONSIBILITIES: Security Managers of Directorates, Special Staff Sections, Deputy Chief of Staff of Intelligence Personnel Security Division, and G-2s of MSCs:

a. Will ensure that all contractors, except persons whose place of employment is physically inside this building and those technical personnel performing routine functions within the building, are escorted from the beginning to the end of their visit. This escort will be an individual who is a cleared permanent employee of building E-2929 and possesses a permanent access badge.

b. Will ensure that new badges for visiting contractor personnel are made. These new badges will indicate the level of security clearance these personnel possess as well as specify "escort required."

PRESCRIBING DIRECTIVES: Directive issued by Secretary of Defense, 20 Aug 54 regarding Restricted Areas, pursuant to section 21, Internal Security Act of 1950; AR 380-5, Information Security Program, Feb 88; AR 380-67, Personnel Security Program, Sep 88; AR 190-16, Physical Security, May 91; AR 530-1, Operations Security, May 91.

DISTRIBUTION: OTHER POLICIES AFFECTED:

Special N/A

c. Will ensure that the DCSINT Security Division has the necessary written request before granting access for the contractor.

POLICY OR PRECEDENT

SUBJECT: DATE: 14 Jun 01

USASOC Personally-Owned Computers/IT Devices Policy

POLICY NUMBER	ORIGINATING SECTION	ORIGINATOR	PHONE
14-01	DCSIM	MR. LEACH	432-2034

/s/
APPROVED BY: ANDREW A. ANGELACCI, Colonel, GS, Chief of Staff

---

SYNOPSIS:

1. PURPOSE: To establish USASOC policy for the use of personally-owned computers/IT devices to process government information.

2. SCOPE: This policy applies to all USASOC personnel, MSCs/MSUs, military, active and reserve components personnel, Department of the Army civilians, and contractors.

3. GENERAL: This policy is punitive in nature. Violations may result in punishment under the Uniform Code of Military Justice (UCMJ), as well as adverse administrative and/or other actions authorized by the United States Code or Federal regulations.

4. POLICY: Information Assurance policies prohibit individuals from processing official government information on personally-owned computers/IT devices, regardless of their location, unless the following conditions are met:

PRESCRIBING DIRECTIVES:

AR 380-19, Information Systems Security, 27 Feb 98;
AR 25-1, Army Information Management, 15 February 2000;
DODI 5200.40, Defense Information Technology Security Certification and Accreditation Process (DITSCAP), Nov 97;
AR 381-14(S), Technical Surveillance Countermeasures (U), 3 October 1986

DISTRIBUTION:
A5

OTHER POLICIES AFFECTED
NONE

a. Personally-owned computers/devices must meet all provisions of AR 380-19, to include formal accreditation utilizing the Defense Information Technology Security Certification and Accreditation Process (DITSCAP). The system/device cannot be utilized or authorized for deployments until formal accreditation approval is received. A copy of the formal accreditation approval letter will be maintained with the equipment at all times.

b. Under no circumstances will classified defense information be processed on personally-owned computers/IT devices.

c. Personally-owned computers/IT devices will be used only in a STAND-ALONE configuration and will not be connected to and/or interface (i.e., cable or Radio Frequency (RF) capabilities) with the ASOCNet or any other government network in any manner.

d. When in a government facility or on deployments and using an accredited personal computer/IT device to process government information, connecting to and/or interfacing with a commercial network/Internet Service Provider (ISP)(i.e., AOL, Earthlink) is prohibited.

e. All government-related information processed on a personally-owned computer/IT device is the property of the government.

f. Personally-owned computers/IT devices will not be allowed in the controlled space of a system or facility (i.e., SCIF) processing classified defense information due to TEMPEST considerations.

5. Deploying with a non-accredited, personally-owned computer/IT device is not authorized under any circumstances due to Operations Security (OPSEC), Information Security (INFOSEC), and System Security. Personal computers/IT devices, (to include laptops, palmtops, hand-held, and organizers) are considered pocket litter (a valuable resource to the adversary). If a non-accredited personally-owned computer/IT device is discovered during a deployment, the device will be confiscated and turned in to security for the duration of the mission.

POLICY OR PRECEDENT

SUBJECT: DATE: 28 Nov 01

Procedures for Government and Employee-Owned Electronic Equipment and Devices Entering or Exiting the USASOC HQ Building (E-2929)

POLICY NUMBER	ORIGINATING SECTION	ORIGINATOR	PHONE
25-01	DCSIM	Mr. Masudi	432-1298

/s/
APPROVED BY: RICHARD W. MILLS, Colonel, GS, Chief of Staff

SYNOPSIS:

1. PURPOSE: To update policy and procedures for Government and employee-owned electronic equipment and devices entering or exiting the USASOC Headquarters (HQ) Building. Highly recommend Commanders implement similar policy for their designated "Restricted" and "Exclusive Access" areas.

2. SCOPE:

a. This policy applies to all USASOC personnel; MSCs/MSUs; military, active and reserve component; and DA Civilians visiting or on official TDY who enter or exit USASOC HQ. Contractor entry procedures are outlined in USASOC Policy 22-00, 13 Dec 00.

b. Electronic equipment and devices include, but are not limited to the following: laptops, notebooks, miniature TVs, cellular phones, cassette players, compact disc players,

PRESCRIBING DIRECTIVES:

AR 190-16, 31 May 91, Physical Security.
AR 190-51, 30 Sep 93, Security of Unclassified Army Property.
AR 380-5, 29 Sep 00, Department of the Army Security Program.
AR 380-19, 28 Feb 98, Information Systems Security.
AR 381-14 (S), 3 Oct 86, Technical Surveillance Countermeasures and TEMPEST (U).
AR 530-1, 3 Mar 95, Operations Security.

DISTRIBUTION:
A5

OTHER POLICIES AFFECTED:
This Policy supersedes USASOC Policy 07-01, 8 May 01

organizers, desktops, facsimile machines, DVD players, video and/or MPG players, one-way pagers/beepers, tape backups, memory chips, and cameras (video, digital, snapshot, Polaroid, etc.).

3. GENERAL: Headquarters, U.S. Army Special Operations Command (HQ, USASOC), Building E-2929, is a designated Restricted Area. Certain areas within this facility are more stringently designated, "For Exclusive Access Only." Government-owned recording/transmitting devices may only enter/exit this facility if deemed mission essential. Employee-owned electronic equipment or devices are not authorized for entry into this facility without specific approval of the Deputy Chief of Staff for Information Management (DCSIM), Information Assurance (IA) Division. A **GREEN** tamper-proof label will be applied to this equipment or device upon approval.

4. POLICY: All personnel entering and exiting Building E-2929 are subject to search and must declare all electronic equipment and devices. All government-owned electronic equipment and devices entering and exiting the building must meet the responsibilities and procedures outlined in paragraph 5 below. All employee-owned (personnel working in Building E-2929 only) electronic equipment and devices entering and exiting this building must meet the exception-to-policy guidelines outlined in paragraph 4a below.

a. Exception-to-policy requests for employee-owned radios, compact disc players, cassette players (not equipped with recording devices), and one-way pagers must be hand carried for entry approval processing to the DCSIM IA Division located on the second floor (cubicle 143 or 144) of Building E-2929. Security Officers will direct personnel requiring entry approval to the DCSIM IA Division and notify the DCSIM IA points of contact (POCs) of the same at 432-1298/4458. **No Employee-Owned Cell Phones are allowed**. Requests must include rank, last name, first name, desk phone number, office, location (room/cubicle number), equipment manufacturer, serial number, and justification (one-way pagers only). After physically examining equipment and verifying required information provided, a **GREEN** tamper-proof label will be applied approving equipment for entry into Building E-2929.

b. Exception-to-policy requests for visitors requiring "one-time" and "temporary" access, carrying unclassified electronic equipment or devices (Government and/or privately owned) must also be hand carried to the DCSIM IA Division **no later than 48 hours prior to the day of requirement, appointment, or event with the following information provided**:

(1) Host/Sponsoring Office.

(2) Office POC and Phone Number.

(3) Justification.

(4) Location of Event.

(5) Date/Time/Duration of Event.

(6) Name/Company/Unit of Individual Carrying Equipment.

(7) Manufacturer's Name, Model, Serial Number (Hand Receipt if carrying Government-owned equipment or devices).

(8) Processing Classification (Secret, Dual, SBU, etc.).

(9) Statement: "Under no circumstances will privately owned and/or non-accredited electronic equipment or devices process Government information or have connectivity to Government-owned equipment, networks, telephone/data lines, or other automated information systems within Building E-2929."

(10) Signature of Director or Division Chief.

c. Visitors carrying classified material, classified electronic equipment, or requiring access to classified information must also provide necessary information listed in paragraph 4b above when their security clearance is passed to this HQ. Personnel carrying classified Government equipment or material must also provide a Hand Receipt (DA Form 2062) for

the equipment and a classified courier authorization from their parent unit or agency. These procedures will ensure smoother access to this facility and eliminate time-consuming entry processing delays at the Security Desk.

5. RESPONSIBILITIES:

a. One-Time/Temporary Access. Host/Sponsoring office Security Manager, IASO, and/or user/owner is responsible for ensuring that necessary information, listed in paragraphs 4b and c above, is provided to the DCSIM IA Division in a timely manner. **Noncompliance with the above procedures will result in equipment not entering this facility**. The Deputy Chief of Staff for Intelligence (DCSINT) Security Officer's desk area is not equipped with a storage area for equipment that was denied entry. In the best interest of Force Protection and OPSEC, the Security Officers will not hold any type of electronic equipment or device at the Security Desk.

b. Government-Owned Cellular (Cell) Phones and Pagers. During the registration process for all USASOC personnel, a color-coded, tamper-proof label will be conspicuously applied to each device. All cell phones will be affixed with **RED** labels and all pagers will be affixed with **YELLOW** labels. In order to properly register devices, all users will report to their respective Information Management Officer (IMO) or Information Assurance Security Officer (IASO) with a Hand Receipt listing the make, model, and serial number of all Government-owned electronic devices in their possession. Once the tamper-proof label is applied, all USASOC personnel will no longer be required to show a Hand Receipt during entry/exit inspections. All other military and Government-related personnel must provide a Hand Receipt for cell phones and pagers being carried before accessing this facility. All non-USASOC personnel requiring access to this facility on a regular basis will be provided with a tamper-proof label for devices being carried. Host office/POC at this HQ is responsible for providing section IASO or appropriate DCSIM Support Team with required justification for issuing necessary labels. The DCSIM Support Teams will provide necessary tamper-proof labels to appropriate IMO/IASOs for

applying to existing cell phones and pagers. The same labels will be applied to all new cell phones and pagers before they are issued to respective users.

c. Government-Owned Computers (including laptops and notebooks) and Facsimile Machines (fax machines). All USASOC computers and fax machines require an accreditation approval label (watermarked version of USASOC Label 8) be applied to appropriate area of the respective equipment. This label will be applied to the bottom area only on all laptop/notebooks and to the visible top or side of all desktop/tower CPUs and fax machines. In addition, USASOC Labels 5 and 7 will also be applied to all desktop/tower CPUs and fax machines only. **USASOC Label 8 is the only label that is applied to laptop/notebook computers.** IAW AR 380-19 and 190-51, personnel must always carry a copy of the accreditation documentation signed by the Designated Accreditation Authority (DAA) and Hand Receipt when computer is removed from the regular place of work. This is also an inspectable item listed on the Command Inspection checklist for the IA area. Routinely, for USASOC personnel only, the Security Officers will visibly check all computers entering or exiting this facility for USASOC Label 8 only. Random spot checks will be conducted for accreditation documentation and Hand Receipts in order to ensure everyone stays in compliance with Army standards. All other military and Government-related personnel requiring access to this facility and carrying a computer will be required to present Hand Receipts for proof of ownership. The name of individual carrying the computer must match the name listed on the Hand Receipt; the serial number of the computer must also match the serial number listed on the Hand Receipt. Host office/POC for visitor at this HQ is responsible for ensuring that aforementioned procedures are complied with, including 4b and c above. The DCSINT Security Force will generate a Security Incident Report to the DCSIM IA Division on all personnel attempting to enter or exit this facility with an unaccredited computer, not carrying the proper accreditation documents, not carrying Hand Receipt for equipment, or not in possession of a classified courier authorization when carrying classified equipment or material.

6. Prior to traveling, all USASOC personnel are hereby notified that other MACOMs, Theaters, and USSOCOM facilities have similar, albeit varying, entry/exit requirements for electronic equipment and devices. All travelers are required to have proper documentation for equipment and devices being carried at all times. USASOC travelers must contact the unit or agency being visited prior to their departure in order to verify on-site entry/exit requirements. Taking this extra step ahead of time will ensure the traveler has trouble-free access at the intended destination.

7. For additional information, contact the current DCSIM IA POCs at 432-1298/4458.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01330

SUBMITTAL PROCEDURES

01/04

PART 1 GENERAL

1.1 DEFINITIONS
1.1.1 Submittal
1.1.2 Submittal Descriptions (SD)
1.1.3 Approving Authority
1.1.4 Work
1.2 SUBMITTALS
1.3 SUBMITTAL CLASSIFICATION
1.3.1 Government Approved
1.3.2 Information Only
1.4 APPROVED SUBMITTALS
1.5 DISAPPROVED SUBMITTALS
1.6 WITHHOLDING OF PAYMENT
1.7 GENERAL
1.8 SUBMITTAL REGISTER
1.9 SCHEDULING
1.10 TRANSMITTAL FORM (ENG FORM 4025)
1.11 SUBMITTAL PROCEDURES
1.11.1 Omitted
1.11.2 Deviations
1.12 CONTROL OF SUBMITTALS
1.13 GOVERNMENT APPROVED SUBMITTALS
1.14 INFORMATION ONLY SUBMITTALS
1.15 STAMPS

-- End of Section Table of Contents --

SECTION 01330

SUBMITTAL PROCEDURES
01/04

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals."

1.1.2 Submittal Descriptions (SD)

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

SD-01 Preconstruction Submittals

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

SD-02 Shop Drawings

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

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

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

SD-03 Product Data

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

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

SD-04 Samples

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

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

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

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

Investigation reports.

Daily checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

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

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

Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or

material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

SD-10 Operation and Maintenance Data

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

SD-11 Closeout Submittals

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

1.1.3 Approving Authority

Office authorized to approve submittal.

1.1.4 Work

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

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal register; G

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 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."

1.3.2 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.

1.4 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.

1.5 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.

1.6 WITHHOLDING OF PAYMENT

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

1.7 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.

1.8 SUBMITTAL REGISTER

At the end of this section is a submittal register showing 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 Government will provide the initial submittal register in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall track all submittals.

1.9 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 21 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.

1.10 TRANSMITTAL FORM (ENG FORM 4025)

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

1.11 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.11.1 Omitted

1.11.2 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.

1.12 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."

1.13 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. Two copies of the submittal will be retained by the Contracting Officer and three copies of the submittal will be returned to the Contractor.

1.14 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.

1.15 STAMPS

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

CONTRACTOR

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheets(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Interior Renovation, Bldg E-2929

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01330	SD-01 Preconstruction Submittals														
			Submittal register		G												
		05586	SD-02 Shop Drawings														
			Column Covers		G AE												
			SD-03 Product Data														
			Column Covers		G AE												
			SD-04 Samples														
			Column Covers		G AE												
		06405	SD-02 Shop Drawings														
			Cube Ceiling System		G AE												
			SD-03 Product Data														
			Wood Ceiling Materials														
			SD-04 Samples														
			Wood Cube		G AE												
		06420	SD-02 Shop Drawings														
			Paneling		G AE												
			SD-03 Product Data														
			Paneling		G AE												
			SD-04 Samples														
			Paneling		G AE												
			SD-07 Certificates														
			Wood Paneling														
		08110	SD-02 Shop Drawings														
			Doors	2.1	G RO												
			Frames	2.7	G RO												
			Accessories	2.5													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Interior Renovation, Bldg E-2929

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		08110	Weatherstripping	2.9													
			Schedule of doors		G RO												
			Schedule of frames		G RO												
			SD-03 Product Data														
			Doors	2.1	G RO												
			Frames	2.7	G RO												
			Accessories	2.5													
			Weatherstripping	2.9													
			SD-04 Samples														
			Factory-applied enamel finish		G RO												
		08120	SD-02 Shop Drawings														
			Doors and frames	2.1	G RO												
			SD-08 Manufacturer's Instructions														
			Doors and frames	2.1													
		08210	SD-02 Shop Drawings														
			Doors	2.1	G RO												
			SD-03 Product Data														
			Doors	2.1	G RO												
			Accessories	2.2													
			Water-resistant sealer	2.3.7													
			warranty	1.4													
			Fire resistance rating	2.1.7	G RO												
			SD-04 Samples														
			Doors	2.1	G AE												
			Door finish colors	2.3.6.4	G RO												
			SD-06 Test Reports														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Interior Renovation, Bldg E-2929

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		08210	Split resistance	2.4														
			Cycle-slam	2.4														
			Hinge loading resistance	2.4														
		08710	SD-02 Shop Drawings															
			Hardware schedule	1.3	G	RO												
			Keying system	2.3.8														
			SD-03 Product Data															
			Hardware items	2.3	G	RO												
			SD-08 Manufacturer's Instructions															
			Installation	3.1														
			SD-10 Operation and Maintenance															
			Data															
			Hardware Schedule	1.3	G	RO												
			SD-11 Closeout Submittals															
			Key bitting	1.4														
		08800	SD-02 Shop Drawings															
			Installation															
			SD-03 Product Data															
			Insulating Glass															
			Plastic Glazing															
			Glazing Accessories	1.3														
			SD-04 Samples															
			Insulating Glass															
			Plastic Sheet															
			Glazing Compound															
			Tape	2.4.5														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Interior Renovation, Bldg E-2929

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		08800	Sealant															
			SD-08 Manufacturer's Instructions															
			Setting and sealing materials	2.4														
			Glass setting	3.2														
		09250	SD-07 Certificates															
			Asbestos Free Materials	2.1														
		09720	SD-03 Product Data															
			Wallcoverings	2.1														
			Installation	3.3														
			Maintenance															
			Clean-Up	3.4														
			SD-04 Samples															
			Wallcoverings	2.1	G	AE												
			SD-07 Certificates															
			Wallcoverings	2.1	G	RO												
			SD-08 Manufacturer's Instructions															
			Wallcoverings	2.1														
			SD-10 Operation and Maintenance															
			Data															
			Wallcoverings	2.1														
		09775	SD-02 Shop Drawings															
			Panels		G	AE												
			SD-03 Product Data															
			Panels		G	RO												
			SD-04 Samples															
			Panels		G	AE												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Interior Renovation, Bldg E-2929

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		09775	SD-11 Closeout Submittals														
			Maintenance Instructions														
		09809	SD-03 Product Data														
			Interior Coating		G AE												
			SD-04 Samples														
			Interior Coating		G AE												
			SD-08 Manufacturer’s Instructions														
			Application		G RO												
			Maintenance and Finish Repair		G RO												
		09900	SD-03 Product Data														
			Coating	2.1	G RO												
			Manufacturer's Technical Data	2.1													
			Sheets														
			SD-04 Samples														
			Color	1.9	G RO												
		10260	SD-02 Shop Drawings														
			Corner Guards	2.2	G RO												
			Wall Guards (Bumper Guards)		G RO												
			SD-03 Product Data														
			Corner Guards	2.2	G RO												
			Wall Guards (Bumper Guards)		G RO												
			SD-04 Samples														
			Finish	2.7	G RO												
			SD-06 Test Reports														
			Corner Guards	2.2													
			Wall Guards (Bumper Guards)														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Interior Renovation, Bldg E-2929

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		10260	SD-07 Certificates															
			Corner Guards	2.2														
			Wall Guards (Bumper Guards)															
		16415A	SD-02 Shop Drawings															
			Interior Electrical Equipment		G	RO												
			SD-03 Product Data															
			Manufacturer's Catalog		G	RO												
			Material, Equipment, and Fixture															
			Lists															
			Installation Procedures		G	RO												
			As-Built Drawings	1.2.6	G	RO												
			Onsite Tests	3.24.2	G	RO												
			SD-06 Test Reports															
			Factory Test Reports		G	RO												
			Field Test Plan		G	RO												
			Field Test Reports	3.22	G	RO												
			SD-07 Certificates															
			Materials and Equipment	1.4														

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01451A

CONTRACTOR QUALITY CONTROL

01/03

PART 1 GENERAL

1.1 REFERENCES
1.2 PAYMENT

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.2 QUALITY CONTROL PLAN
3.2.1 Content of the CQC Plan
3.2.2 Acceptance of Plan
3.2.3 Notification of Changes
3.3 COORDINATION MEETING
3.4 QUALITY CONTROL ORGANIZATION
3.4.1 Personnel Requirements
3.4.2 CQC System Manager
3.4.3 CQC Personnel
3.4.4 Additional Requirement
3.4.5 Organizational Changes
3.5 SUBMITTALS AND DELIVERABLES
3.6 CONTROL
3.6.1 Preparatory Phase
3.6.2 Initial Phase
3.6.3 Follow-up Phase
3.6.4 Additional Preparatory and Initial Phases
3.7 TESTS
3.7.1 Testing Procedure
3.7.2 Testing Laboratories
3.7.2.1 Capability Check
3.7.2.2 Capability Recheck
3.7.3 Onsite Laboratory
3.7.4 Furnishing or Transportation of Samples for Testing
3.8 COMPLETION INSPECTION
3.8.1 Punch-Out Inspection
3.8.2 Pre-Final Inspection
3.8.3 Final Acceptance Inspection
3.9 DOCUMENTATION
3.10 SAMPLE FORMS
3.11 NOTIFICATION OF NONCOMPLIANCE

-- End of Section Table of Contents --

SECTION 01451A

CONTRACTOR QUALITY CONTROL
01/03

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2002) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

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

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 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 14 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 45 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.

3.2.1 Content of the CQC Plan

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

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer shall be used.)

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.

3.2.2 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.

3.2.3 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 7 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, shop 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 graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 5 years construction experience on construction similar to this contract or a construction person with a minimum of 8 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 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: ~~electrical~~civil. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan.

Experience Matrix

Area	Qualifications
~~a. Electrical~~	~~Graduate Electrical Engineer with 2 yrs related experience or person with 5 yrs related experience~~
a. Civil	Graduate Civil Engineer with 3 years experience in the type of work being performed on this project or technician with 6 yrs related experience

3.4.4 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at area office.

3.4.5 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 AND DELIVERABLES

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. When Section 15950A HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS; 15951A DIRECT DIGITAL CONTROL FOR HVAC; 15990A TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS; or 15995A COMMISSIONING OF HVAC SYSTEMS are included in the contract, the submittals required by those sections shall be coordinated with Section 01330 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

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 the construction 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 24 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 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not

being met.

3.6.3 Follow-up Phase

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

3.6.4 Additional Preparatory and Initial Phases

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

3.7 TESTS

3.7.1 Testing Procedure

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

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

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

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

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

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $100 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

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

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory.

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the S~~pecial~~PECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the 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.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at 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".

3.9 DOCUMENTATION

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

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of 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. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

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

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05586

METAL COLUMN COVERS

PART 1 GENERAL

1.1 SUMMARY
1.2 SUBMITTALS
1.3 DELIVERY, STORAGE AND HANDLING

PART 2 PRODUCTS

2.1 MANUFACTURER
2.2 SYSTEMS
2.3 MATERIALS
2.3.1 Stainless Steel
2.3.2 Steel Stiffener
2.4 FINISHES
2.4.1 Column Covers
2.4.2 Top and Bottom Caps
2.5 FABRICATION

PART 3 EXECUTION

3.1 STORAGE
3.2 INSTALLATION
3.3 CLEANING AND PROTECTION

-- End of Section Table of Contents --

SECTION 05586

METAL COLUMN COVERS

PART 1 GENERAL

1.1 SUMMARY

a. Extent of column cover system is as shown on drawings and schedules.

b. Drawings and general provisions of the Contract documents apply to work of this section.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-2 Shop Drawings

Column Covers; G, AE.

Shop drawings shall show thickness, alloys, dimensions, sizes, joints, finishes and attachments.

SD-3 Product Data

Column Covers; G, AE.

Submit manufacturer's tech brief for each type column cover required.

SD-4 Samples

Column Covers; G, AE

Samples shall include a 4 inch by 4 inch piece of each type of metal and finish specified. Samples shall include samples of all support materials to be used.

1.3 DELIVERY, STORAGE AND HANDLING

All materials shall be protected during fabrication, shipment, site storage and erection to prevent damage to the finished work from other trades. Materials to be stored in a manner such that they will be protected against damage from moisture, direct sunlight, surface contamination and other causes.

PART 2 PRODUCTS

2.1 MANUFACTURER

See Section 09000, BUILDING COLOR AND FINISH SCHEDULE for manufacturer reference.

2.2 SYSTEMS

Provide a coordinated and integrated system of column covers and mounting hardware from a single manufacturer.

2.3 MATERIALS

2.3.1 Stainless Steel

Stainless steel sheet shall be Type 304 with a minimum thickness of 20 gauge.

2.3.2 Steel Stiffener

Steel stiffener sheet shall be galvanized with a minimum thickness of 20 gauge.

2.4 FINISHES

2.4.1 Column Covers

Column Covers shall be "Linen" finish stainless steel with "Tech" embossures, as indicated in Section 09000 BUILDING COLOR AND FINISH SCHEDULE.

2.4.2 Top and Bottom Caps

Top and bottom caps shall be "Sandstone Fused Nickel Silver" stainless steel, as indicated in Section 09000 BUILDING COLOR AND FINISH SCHEDULE.

2.5 FABRICATION

Radius of column covers shall be 12"; height of column covers shall be up to ten (10) feet without horizontal joints. Column covers shall have butt vertical joints on opposite sides of the column.

PART 3 EXECUTION

3.1 STORAGE

Prior to installation, column covers must be stored away from direct sunlight or high heat.

3.2 INSTALLATION

Install column covers in accordance with manufacturer's written instructions and shop drawings.

Column covers shall be erected plumb, level and true to line. Column covers shall be securely anchored in proper alignment and relationship to work of other trades.

Column covers shall be inspected and be free of dents, scratches and other defects prior to installation.

3.3 CLEANING AND PROTECTION

Remove protective coverings after installation. Clean all surfaces following installation. General Contractor shall protect covers from damage after installation through substantial completion of project.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 06 - WOOD AND PLASTICS

SECTION 06405

WOOD CUBE SUSPENDED CEILING SYSTEMS

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL
1.3 SCOPE
1.4 QUALITY ASSURANCE
1.4.1 Installer Qualifications
1.4.2 Performance Characteristics
1.5 PROJECT CONDITIONS
1.6 COORDINATION OF WORK
1.7 SUBMITTALS
1.8 DELIVERY, STORAGE AND HANDLING

PART 2 PRODUCTS

2.1 WOOD CUBES
2.2 SUSPENSION SYSTEM
2.3 EDGES, BORDERS, AND PERIMETER TRIMS
2.4 FINISHES AND COLORS

PART 3 EXECUTION

3.1 PREPARATION
3.1.1 Ceiling Layout
3.1.2 Coordination
3.2 INSTALLATION
3.2.1 General
3.2.2 HVAC and Light Fixture Suspension
3.3 ADJUSTMENT AND CLEANING
3.4 WARRANTIES
3.4.1 Manufacturer

-- End of Section Table of Contents --

SECTION 06405

WOOD CUBE SUSPENDED CEILING SYSTEMS

PART 1 GENERAL

1.1 REFERENCES

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 84	(2001) Surface Burning Characteristics of Building Materials

1.2 GENERAL

A. The requirements of Division 1 of the Specifications shall apply to all work hereunder.

B. All work shall be completed in accordance with the ceiling system manufacturer's instructions.

1.3 SCOPE

Furnish all necessary Wood Cubes, wood trim, and wood suspension carriers for complete installation in accordance with plans and specifications.

1.4 QUALITY ASSURANCE

1.4.1 Installer Qualifications

Must be a firm with not less than two (2) years of successful experience in installation of suspended wood ceilings of similar requirements to this project.

1.4.2 Performance Characteristics

When specified as "Fire Resistant", the Wood Cubes shall conform to Class 1, or A flame spread rating, when tested in accordance with ASTM E 84.

1.5 PROJECT CONDITIONS

Installation shall be done only when the temperature and humidity closely approximate the interior conditions that will exist when the building is occupied. The heating and cooling systems shall be operating before, during, and after installation, with the humidity of the interior spaces maintained between 25% and 55%.

It is important that plenums have proper ventilation, especially in high moisture areas. There shall be no excessive build-up of heat in the ceiling areas.

Prior to the start of installation, all exterior windows and doors are to be in place, glazed, and weather-stripped. The roof is to be watertight, and all wet trades' work is to be completed and thoroughly dry.

Mechanical, electrical, and other utility service installations above the

ceiling plane shall have been completed. No materials should rest against, or wrap around, the ceiling suspension components or connecting hangers.

1.6 COORDINATION OF WORK

The layout and installation of the Wood Cube ceiling and suspension system components shall be coordinated with other work penetrating the ceiling. This includes light fixtures, HVAC equipment, and fire suppression system components.

1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-2 Shop Drawings

Cube Ceiling System; G, AE

Supply shop drawings showing Wood Cube locations and placement of hangers, carriers, and other details deemed pertinent to proper installation.

SD-3 Product Data

Wood Ceiling Materials;

Provide manufacturer specifications for all wood ceiling materials supplied.

SD-4 Samples

Wood Cube; G, AE

A 12 inch by 12 inch wood cube sample in the specified size shall be submitted for approval.

1.8 DELIVERY, STORAGE AND HANDLING

The wood Cube panels shall be delivered to the project site in original, unopened packages.

The Wood Cubes shall be stored flat and level in a fully enclosed space. For a minimum of seventy-two (72) hours immediately prior to ceiling installation, the Wood Cubes shall be stored in the room in which they will be installed. The temperature and humidity of the room shall closely approximate those conditions that will exist when the building is occupied. The Wood Cubes must be stored off the floor.

Care in handling must be exercised to avoid damage.

PART 2 PRODUCTS

2.1 WOOD CUBES

The Wood Cubes shall be manufactured from prime grade, all-natural maple with transparent stain finish. The Wood Cube style shall be continuous, made in a panel size 24 inches wide by 48 inches long. The selected pattern shall have wood strip dimensions of; 6 inches by 6 inches cells, 3/8 inch thick by 3 inches deep. Wood cube panels shall be cut to fit existing edge conditions as shown on drawings.

Wood is a natural product that will undergo changes with variations in the environment. Therefore, all dimension tolerances are ± 1/8 inch.

2.2 SUSPENSION SYSTEM

Continuous Wood Cube panels shall be supported by an integrated wood suspension system. The wood grid system shall be fabricated to install 2 feet by 4 feet Wood Cube panels. Hangers shall be installed 4 feet o.c. along the main carriers - starting 4 inches from the either end. Grid system shall be centered in each continuous field of ceiling, and grid system shall be custom-fitted to existing conditions at edges of each ceiling field, as shown on drawings.

2.3 EDGES, BORDERS, AND PERIMETER TRIMS

Edges, borders, and perimeter trims shall be in accordance with standard design details available from ceiling manufacturer. All wood ceiling products specified shall be supplied by the ceiling manufacturer.

2.4 FINISHES AND COLORS

All Wood Cube panels shall be factory-finished with clear sealers and wood stain to match finish WV-1 Wood Veneer as shown in Section 09000, BUILDING COLOR AND FINISH SCHEDULE. Sample for matching to be furnished by Owner.

Wood is a natural product with variations in grain, texture, and color - often ranging from light to dark; thereby affecting the surface look. Product finishes shall be stain or sealer coats, spray-applied to a smooth-sawn surface. The wood strips shall not be sanded.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Ceiling Layout

The ceiling installation Contractor shall measure ceiling areas and establish positions of hangers and rails in accordance with installation instructions.

3.1.2 Coordination

The ceiling installation Contractor shall furnish the layout for supports that shall be installed for suspension of ceilings. He shall furnish concrete inserts, steel deck hanger clips, or similar devices for installation in time to coordinate the work.

3.2 INSTALLATION

3.2.1 General

The ceiling installation Contractor shall install materials to comply with governing regulations and applicable industry standards.

3.2.2 HVAC and Light Fixture Suspension

Electrical and mechanical installations shall be supported independent of the Wood Cubes.

3.3 ADJUSTMENT AND CLEANING

The ceiling installation Contractor shall make final adjustment to level or contours.

Upon completion of ceiling installation, all Wood Cubes and borders must be cleaned free of dirt, dust, grease, oils, and fingerprints. Wood strips shall be wiped with furniture polish to enhance the surface finish.

All work that cannot be successfully cleaned and repaired shall be removed and replaced.

3.4 WARRANTIES

3.4.1 Manufacturer

All materials supplied by the ceiling manufacturer shall be guaranteed against manufacturing defects for one (1) year. Because of differing site conditions, wood coloring and finishes can vary with age, and shall be excluded from this warranty.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 06 - WOOD AND PLASTICS

SECTION 06420

PANELING

PART 1 GENERAL

1.1 REFERENCES
1.2 SUMMARY
1.3 SUBMITTALS
1.4 QUALITY ASSURANCE
1.4.1 Fabricator Qualifications
1.4.2 Installer Qualifications
1.4.3 Source Limitations
1.4.4 Quality Standard
1.4.5 Fire-Test-Response Characteristics
1.5 DELIVERY, STORAGE AND HANDLING
1.6 PROJECT CONDITIONS
1.6.1 Environmental Limitations
1.6.2 Field Measurements
1.7 COORDINATION

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 General
2.1.2 Wood Products
2.1.3 Adhesives
2.1.4 VOC Limits for Installing Adhesives and Glues
2.2 FIRE-RETARDANT-TREATED MATERIALS
2.2.1 General
2.2.2 Fire-Retardant Fiberboard
2.3 INSTALLATION MATERIALS
2.3.1 Furring, Blocking, Shims, and Hanging Strips
2.3.2 Anchors
2.4 FABRICATION, GENERAL
2.4.1 Paneling Grade
2.4.2 Wood Moisture Content
2.4.3 Sanding
2.4.4 Fitting
2.4.5 Shop Cut Openings
2.5 FLUSH WOOD PANELING FOR TRANSPARENT FINISH
2.5.1 Grade
2.5.2 Wood Veneer Species and Cut
2.5.3 Matching of Adjacent Veneer Leaves
2.5.4 Matching Within Panel Face
2.5.5 Panel-Matching Method
2.5.6 Vertical Panel-Matching Method
2.5.7 Panel Core Construction
2.5.8 Exposed Panel Edges
2.5.9 Panel Reveals
2.5.10 Fire-Retardant-Treated Paneling
2.5.11 Thickness
2.6 SHOP FINISHING
2.6.1 Grade

2.6.2 General
2.6.3 Preparation for Finishing
2.6.4 Transparent Finish:

PART 3 EXECUTION

3.1 PREPARATION
3.2 INSTALLATION
3.3 ADJUSTING AND CLEANING

-- End of Section Table of Contents --

SECTION 06420

PANELING

PART 1 GENERAL

1.1 REFERENCES

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

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI Qual Stds	(1999) Architectural Woodwork Quality Standards

1.2 SUMMARY

This Section includes the following: Flush wood paneling. Paneling includes wood furring, blocking, and shims for installing paneling, unless concealed within other construction before paneling installation.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-2 Shop Drawings

Paneling; G, AE;

Show location of paneling, large-scale details, attachment devices, and other components. Include dimensioned plans and elevations.
a. Show details full size.
b. Show locations and sizes of furring and blocking, including concealed blocking specified in other Sections.
c. For paneling produced from premanufactured sets, show finished panel sizes, set numbers, sequence numbers within sets, and method of cutting panels to produce indicated sizes.
d. For paneling veneered in fabrication shop, show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
e. Apply WI-certified compliance label to first page of shop drawings.

SD-3 Product Data

Paneling; G, AE;

For wood panels as indicated, including finishing materials and processes.

SD-4 Samples

Paneling; G, AE;

Samples for verification - Veneer-faced panel products with or for transparent finish, 12 by 24 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.

SD-7 Certificates

Wood Paneling;

For each type of product, signed by product manufacturer.
Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
Qualification Data; For Installer/Fabricator.

1.4 QUALITY ASSURANCE

1.4.1 Fabricator Qualifications

Shop that employs skilled workers who custom-fabricate products similar to those required for this project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.

1.4.2 Installer Qualifications

Installer shall be same as fabricator of products and certified participant in AWI's Quality Certification Program.

1.4.3 Source Limitations

Engage a qualified woodworking firm to assume undivided responsibility for production of paneling with sequence-matched wood veneers.

1.4.4 Quality Standard

Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of paneling indicated for construction, finishes, installation, and other requirements.

1.4.5 Fire-Test-Response Characteristics

Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

1.5 DELIVERY, STORAGE AND HANDLING

Do not deliver paneling until painting and similar operations that could damage paneling have been completed in installation areas. If paneling must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.6 PROJECT CONDITIONS

1.6.1 Environmental Limitations

Do not deliver or install paneling until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.6.2 Field Measurements

Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 COORDINATION

Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General

Provide materials that comply with requirements of AWI Qual Stds for quality grade specified, unless otherwise indicated.

2.1.2 Wood Products

Comply with the following:

a. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.

b. Particleboard: ANSI A208.1, Grade Mw.

c. Particleboard: Straw-based particleboard complying with requirements of ANSI A208.1, Grade M-2, except for density.

d. Softwood Plywood: DOC PS 1, Medium Density Overlay.

e. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.

2.1.3 Adhesives

Do not use adhesives that contain urea formaldehyde.

2.1.4 VOC Limits for Installing Adhesives and Glues

Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

a. Wood Glues: 30 g/L.
b. Panel Adhesives: 50 g/L.
c. Contact Adhesive: 250 g/L.

2.2 FIRE-RETARDANT-TREATED MATERIALS

2.2.1 General

Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction and that comply with requirements in this Article and with fire-test-response characteristics specified.

a. Do not use treated materials that do not comply with requirements of referenced woodworking standard or that are warped, discolored, or otherwise defective.

b. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.

c. Identify fire-retardant-treated materials with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.2.2 Fire-Retardant Fiberboard

Medium-density fiberboard panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E 84.

2.3 INSTALLATION MATERIALS

2.3.1 Furring, Blocking, Shims, and Hanging Strips

Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

2.3.2 Anchors

Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.4 FABRICATION, GENERAL

2.4.1 Paneling Grade

Provide Premium grade paneling complying with referenced quality standard.

2.4.2 Wood Moisture Content

Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

2.4.3 Sanding

Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

2.4.4 Fitting

Complete fabrication, including assembly and finishing, to maximum extent possible, before shipment to project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

a. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on approved shop drawings before disassembling for shipment.

2.4.5 Shop Cut Openings

Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2.5 FLUSH WOOD PANELING FOR TRANSPARENT FINISH

2.5.1 Grade

Premium.

2.5.2 Wood Veneer Species and Cut

Makore, quarter figured.

a. Lumber Trim and Edges: At paneling fabricator's option, trim and edges indicated as solid wood (except moldings) may be either lumber or veneered construction of same species and cut as panel faces and compatible with grain and color of panel faces.

2.5.3 Matching of Adjacent Veneer Leaves

Slip match.

2.5.4 Matching Within Panel Face

Balance match.

2.5.5 Panel-Matching Method

No matching is required between panels. Select and arrange panels for similarity of grain pattern and color between adjacent panels.

2.5.6 Vertical Panel-Matching Method

See drawings for direction of grain on panels.

2.5.7 Panel Core Construction

Fire-retardant particleboard or fire-retardant, medium-density fiberboard.

2.5.8 Exposed Panel Edges

Solid wood or wood veneer matching faces.

2.5.9 Panel Reveals

No reveals; butt panels together with hairline joint.

2.5.10 Fire-Retardant-Treated Paneling

Provide panels consisting of wood-veneer and fire-retardant particleboard or fire-retardant, medium-density fiberboard.

2.5.11 Thickness

Provide paneling of thickness shown or, if not shown, 3/4-inch minimum thickness. Assemble by gluing and concealed fastening.

2.6 SHOP FINISHING

2.6.1 Grade

Provide finishes of same grades as paneling to be finished.

2.6.2 General

Finish paneling at fabrication shop as specified in this Section. Defer only final touch-up, cleaning, and polishing until after installation.

2.6.3 Preparation for Finishing

Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing paneling, as applicable to each unit of work.

2.6.4 Transparent Finish:

a. Grade: Premium.
b. AI Finish System: Catalyzed lacquer for high traffic, similar to Chemcraft:

424-4435	Dan Speed	35 Sheet Top-Coat
432-1220	Dan-Seal	Sealer
873-0870	Catalyst	

c. Staining: Match approved sample for color.
d. Wash Coat for Stained Finish: Apply wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.
e. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
bf. Filled Finish for Open-Grain Woods: After staining (if any), apply paste wood filler to open-grain woods and wipe off excess. Tint filler to match stained wood.
(1) Apply wash-coat sealer after staining and before filling.
G. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ATM D 523.

PART 3 EXECUTION

3.1 PREPARATION

Before installation, condition paneling to average prevailing humidity conditions in installation areas.

Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and buckraming.

3.2 INSTALLATION

Grade: Install paneling to comply with requirements for same grade specified in Part 2 for fabrication of type of paneling involved.

Install paneling level, plumb, true, and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches. Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.

a. For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels not exceeding 1/16 inch.

Scribe and cut paneling to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening unless covered by trim.

Complete finishing work specified in this Section to extent not completed at shop or before installation of paneling. Fill nail holes with matching filler where exposed. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

Refer to Division 9 Sections for final finishing of installed paneling.

3.3 ADJUSTING AND CLEANING

Repair damaged and defective paneling, where possible, to eliminate functional and visual defects; where not possible to repair, replace paneling. Adjust for uniform appearance.

Clean paneling on exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 08 - DOORS AND WINDOWS

SECTION 08110

STEEL DOORS AND FRAMES

05/01

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 STANDARD STEEL DOORS
2.1.1 Classification - Level, Performance, Model
2.1.1.1 Omitted
2.1.1.2 Omitted
2.1.1.3 Omitted
2.1.1.4 Maximum Duty Doors
2.2 OMITTED
2.3 OMITTED
2.4 OMITTED
2.5 ACCESSORIES
2.5.1 Omitted
2.5.2 Exterior Louvers
2.5.3 Astragals
2.5.4 Moldings
2.6 OMITTED
2.7 STANDARD STEEL FRAMES
2.7.1 Welded Frames
2.7.2 Omitted
2.7.3 Omitted
2.7.4 Stops and Beads
2.7.5 Omitted
2.7.6 Omitted
2.7.7 Anchors
2.7.7.1 Wall Anchors
2.7.7.2 Floor Anchors
2.8 FIRE AND SMOKE DOORS AND FRAMES
2.8.1 Labels
2.8.2 Omitted
2.8.3 Astragal on Fire and Smoke Doors
2.9 WEATHERSTRIPPING
2.10 HARDWARE PREPARATION
2.11 FINISHES
2.11.1 Factory-Primed Finish
2.11.2 Omitted
2.11.3 Electrolytic Zinc-Coated Anchors and Accessories
2.12 FABRICATION AND WORKMANSHIP
2.12.1 Grouted Frames

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Frames
3.1.2 Doors
3.1.3 Fire and Smoke Doors and Frames
3.2 PROTECTION
3.3 CLEANING

-- End of Section Table of Contents --

SECTION 08110

STEEL DOORS AND FRAMES

05/01

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A250.6	(1997) Hardware on Standard Steel Doors (Reinforcement - Application)
ANSI A250.8	(1998) SDI-100 Recommended Specifications for Standard Steel Doors and Frames

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 591	(1998) Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications

DOOR AND HARDWARE INSTITUTE (DHI)

BHMA A115	(1991) Steel Door Preparation Standards (Consisting of A115.1 through A115.6 and A115.12 through A115.18)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1999) Fire Doors and Fire Windows
NFPA 105	(1999) The Installation of Smoke-Control Door Assemblies
NFPA 252	(1999) Standard Methods of Fire Tests of Door Assemblies

STEEL DOOR INSTITUTE (SDOI)

SDI 105	(1998) Recommended Erection Instructions for Steel Frames
SDI 111-F	Recommended Existing Wall Anchors for Standard Steel Doors and Frames

UNDERWRITERS LABORATORIES (UL)

UL 10B	(1997) Fire Tests of Door Assemblies

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Doors; G, RO

Frames; G, RO

Accessories

Weatherstripping

Show elevations, construction details, metal gages, hardware provisions, method of glazing, and installation details.

Schedule of doors; G, RO

Schedule of frames; G, RO

Submit door and frame locations.

SD-03 Product Data

Doors; G, RO

Frames; G, RO

Accessories

Weatherstripping

Submit manufacturer's descriptive literature for doors, frames, and accessories. Include data and details on door construction, panel (internal) reinforcement, insulation, and door edge construction. When "custom hollow metal doors" are provided in lieu of "standard steel doors," provide additional details and data sufficient for comparison to ANSI A250.8 requirements.

SD-04 Samples

Factory-applied enamel finish; G, RO

Where colors are not indicated, submit manufacturer's standard colors and patterns for selection.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver doors, frames, and accessories undamaged and with protective wrappings or packaging. Provide temporary steel spreaders securely fastened to the bottom of each welded frame. Store doors and frames on platforms under cover in clean, dry, ventilated, and accessible locations, with 1/4 inch airspace between doors. Remove damp or wet packaging immediately and wipe affected surfaces dry. Replace damaged materials with new.

PART 2 PRODUCTS

2.1 STANDARD STEEL DOORS

ANSI A250.8, except as specified otherwise. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Undercut where indicated. Exterior doors shall have top edge closed flush and sealed to prevent water intrusion. Doors shall be 1 3/4 inches thick, unless otherwise indicated.

2.1.1 Classification - Level, Performance, Model

2.1.1.1 Omitted
2.1.1.2 Omitted
2.1.1.3 Omitted

2.1.1.4 Maximum Duty Doors

ANSI A250.8, Level 4, physical performance Level A, Model 1 with core construction as required by the manufacturer for indicated exterior doors, of size(s) and design(s) indicated. Where vertical stiffener cores are required, the space between the stiffeners shall be filled with mineral board insulation.

2.2 OMITTED
2.3 OMITTED
2.4 OMITTED

2.5 ACCESSORIES

2.5.1 Omitted

2.5.2 Exterior Louvers

Louvers shall be inverted "Y" type with minimum of 35 percent net-free opening. Weld or tenon louver blades to continuous channel frame and weld assembly to door to form watertight assembly. Form louvers of hot-dip galvanized steel of same gage as door facings. Louvers shall have steel-framed insect screens secured to room side and readily removable. Provide aluminum wire cloth, 18 by 18 or 18 by 16 inch mesh, for insect screens. Net-free louver area to be before screening.

2.5.3 Astragals

For pairs of exterior steel doors which will not have aluminum astragals or removable mullions, as specified in Section 08710, "Door Hardware," provide overlapping steel astragals with the doors.

2.5.4 Moldings

Provide moldings around glass of interior and exterior doors and louvers of interior doors. Provide nonremovable moldings on outside of exterior doors and on corridor side of interior doors. Other moldings may be stationary or removable. Secure inside moldings to stationary moldings, or provide snap-on moldings. Muntins shall interlock at intersections and shall be fitted and welded to stationary moldings.

2.6 OMITTED

2.7 STANDARD STEEL FRAMES

ANSI A250.8, except as otherwise specified. Form frames to sizes and shapes indicated, with welded corners. Provide steel frames for doors and cased openings, unless otherwise indicated.

2.7.1 Welded Frames

Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth.

2.7.2 Omitted
2.7.3 Omitted

2.7.4 Stops and Beads

Form stops and beads from 20 gage steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval-head, countersunk Phillips self-tapping sheet metal screws or concealed clips and fasteners. Space fasteners approximately 12 to 16 inches on centers. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

2.7.5 Omitted
2.7.6 Omitted

2.7.7 Anchors

Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage.

2.7.7.1 Wall Anchors

Provide at least three anchors for each jamb. For frames which are more than 7.5 feet in height, provide one additional anchor for each jamb for each additional 2.5 feet or fraction thereof.

a. Masonry: Provide anchors of corrugated or perforated steel straps or 3/16 inch diameter steel wire, adjustable or T-shaped;

b. Stud partitions: Weld or otherwise securely fasten anchors to backs of frames. Design anchors to be fastened to closed steel studs with sheet metal screws, and to open steel studs by wiring or welding;

c. Completed openings: Secure frames to previously placed concrete or masonry with expansion bolts in accordance with SDI 111-F.

2.7.7.2 Floor Anchors

Provide floor anchors drilled for 3/8 inch anchor bolts at bottom of each jamb member.

2.8 FIRE AND SMOKE DOORS AND FRAMES

NFPA 80 and NFPA 105 and this specification. The requirements of NFPA 80

and NFPA 105 shall take precedence over details indicated or specified.

2.8.1 Labels

Fire doors and frames shall bear the label of Underwriters Laboratories (UL), Factory Mutual Engineering and Research (FM), or Warnock Hersey International (WHI) attesting to the rating required. Testing shall be in accordance with NFPA 252 or UL 10B. Labels shall be metal with raised letters, and shall bear the name or file number of the door and frame manufacturer. Labels shall be permanently affixed at the factory to frames and to the hinge edge of the door. Door labels shall not be painted.

2.8.2 Omitted

2.8.3 Astragal on Fire and Smoke Doors

On pairs of labeled fire doors, conform to NFPA 80 and UL requirements. On smoke control doors, conform to NFPA 105.

2.9 WEATHERSTRIPPING

As specified in Section 08710, "Door Hardware."

2.10 HARDWARE PREPARATION

Provide minimum hardware reinforcing gages as specified in ANSI A250.6. Drill and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of ANSI A250.8 and ANSI A250.6. For additional requirements refer to BHMA A115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Locate hardware in accordance with the requirements of ANSI A250.8, as applicable. Punch door frames, with the exception of frames that will have weatherstripping, to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

2.11 FINISHES

2.11.1 Factory-Primed Finish

All surfaces of doors and frames shall be thoroughly cleaned, chemically treated and factory primed with a rust inhibiting coating as specified in ANSI A250.8. Finish coating shall be field painted. Refer to Section 09900 PAINTS AND COATINGS.

2.11.2 Omitted

2.11.3 Electrolytic Zinc-Coated Anchors and Accessories

Provide electrolytically deposited zinc-coated steel in accordance with ASTM A 591, Commercial Quality, Coating Class A. Phosphate treat and factory prime zinc-coated surfaces as specified in ANSI A250.8.

2.12 FABRICATION AND WORKMANSHIP

Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp,

and buckle. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction indicated. Corner joints shall be well formed and in true alignment. Conceal fastenings where practicable. Design other frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to receive calking compound.

2.12.1 Grouted Frames

For frames to be installed in exterior walls and to be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Frames

Set frames in accordance with SDI 105. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners. Build in or secure wall anchors to adjoining construction. Backfill frames with mortar. When an additive is provided in the mortar, coat inside of frames with corrosion-inhibiting bituminous material. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.

3.1.2 Doors

Hang doors in accordance with clearances specified in ANSI A250.8. After erection and glazing, clean and adjust hardware.

3.1.3 Fire and Smoke Doors and Frames

Install fire doors and frames, including hardware, in accordance with NFPA 80. Install fire rated smoke doors and frames in accordance with NFPA 80 and NFPA 105.

3.2 PROTECTION

Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is removed. Clean thoroughly. Apply an all-over coat of rust-inhibitive paint of the same type used for shop coat.

3.3 CLEANING

Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 08 - DOORS AND WINDOWS

SECTION 08120

ALUMINUM DOORS AND FRAMES

09/99

PART 1 GENERAL

1.1 REFERENCES
1.2 PERFORMANCE REQUIREMENTS
1.2.1 Structural
1.2.2 Air Infiltration
1.2.3 Water Penetration
1.3 SUBMITTALS
1.4 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 DOORS AND FRAMES
2.2 MATERIALS
2.2.1 Anchors
2.2.2 Weatherstripping
2.2.3 Aluminum Alloy for Doors and Frames
2.2.4 Fasteners
2.2.5 Structural Steel
2.2.6 Aluminum Paint
2.3 FABRICATION
2.3.1 Omitted
2.3.2 Aluminum Doors
2.3.2.1 Full Glazed Stile and Rail Doors
2.3.3 Omitted
2.3.4 Weatherstripping
2.3.5 Omitted
2.3.6 Provisions for Hardware
2.3.7 Provisions for Glazing
2.3.8 Finishes
2.3.8.1 Anodic Coating

PART 3 EXECUTION

3.1 INSTALLATION
3.2 PROTECTION FROM DISSIMILAR MATERIALS
3.2.1 Dissimilar Metals
3.2.2 Drainage from Dissimilar Metals
3.2.3 Masonry and Concrete
3.2.4 Wood or Other Absorptive Materials
3.3 CLEANING
3.4 PROTECTION

-- End of Section Table of Contents --

SECTION 08120

ALUMINUM DOORS AND FRAMES
09/99

PART 1 GENERAL

1.1 REFERENCES

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

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(1980) Aluminum Finishes

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M	(1997; Rev. A) Carbon Structural Steel
ASTM B 209	(1996) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 221	(1996) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM E 283	(1991) Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E 331	(1996) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.2 PERFORMANCE REQUIREMENTS

1.2.1 Structural

Shapes and thicknesses of framing members shall be sufficient to withstand a design wind load of not less than 30 pounds per square foot of supported area with a deflection of not more than 1/175 times the length of the member and a safety factor of not less than 1.65. Provide glazing beads, moldings, and trim of not less than 0.050 inch nominal thickness.

1.2.2 Air Infiltration

When tested in accordance with ASTM E 283, air infiltration shall not exceed 0.06 cubic feet per minute per square foot of fixed area at a test pressure of 6.24 pounds per square foot (50 mile per hour wind).

1.2.3 Water Penetration

When tested in accordance with ASTM E 331, there shall be no water penetration at a pressure of 8 pounds per square foot of fixed area.

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Doors and frames; G, RO

Show elevations of each door type, size of doors and frames, metal gages, details of door and frame construction, methods of anchorage, glazing details, weatherstripping, provisions for and location of hardware, and details of installation.

SD-08 Manufacturer's Instructions

Doors and frames

Submit detail specifications and instructions for installation, adjustments, cleaning, and maintenance.

1.4 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the site for damage. Unload and store with minimum handling. Provide storage space in dry location with adequate ventilation, free from dust or water, and easily accessible for inspection and handling. Stack materials on nonabsorptive strips or wood platforms. Do not cover doors and frames with tarps, polyethylene film, or similar coverings. Protect finished surfaces during shipping and handling using manufacturer's standard method, except that no coatings or lacquers shall be applied to surfaces to which calking and glazing compounds must adhere.

PART 2 PRODUCTS

2.1 DOORS AND FRAMES

Swing-type aluminum doors and frames of size, design, and location indicated. Provide doors and frame stops only, for installation in existing frames.

2.2 MATERIALS

2.2.1 Anchors

Stainless steel or steel with hot-dipped galvanized finish.

2.2.2 Weatherstripping

Continuous wool pile, silicone treated, or type recommended by door manufacturer.

2.2.3 Aluminum Alloy for Doors and Frames

ASTM B 221, Alloy 6063-T5 for extrusions. ASTM B 209, alloy and temper best suited for aluminum sheets and strips.

2.2.4 Fasteners

Hard aluminum or stainless steel.

2.2.5 Structural Steel

ASTM A 36/A 36M.

2.2.6 Aluminum Paint

Type as recommended by aluminum door manufacturer.

2.3 FABRICATION

2.3.1 Omitted

2.3.2 Aluminum Doors

2.3.2.1 Full Glazed Stile and Rail Doors

Doors shall have narrow, heavy duty stiles and rails as indicated. Fabricate from extruded aluminum hollow seamless tubes or from a combination of open-shaped members interlocked or welded together. Fasten top and bottom rail together by means of welding or by 3/8 or 1/2 inch diameter cadmium-plated tensioned steel tie rods. Provide an adjustable mechanism of jack screws or other methods in the top rail to allow for minor clearance adjustments after installation. Minimum tube thickness to be 3/16 inch, minimum door thickness 2 inches.

2.3.3 Omitted

2.3.4 Weatherstripping

Provide on stiles and rails of exterior doors. Fit into slots which are integral with doors or frames. Weatherstripping shall be replaceable without special tools, and adjustable at meeting rails of pairs of doors. Installation shall allow doors to swing freely and close positively. Air leakage of a single leaf weatherstripped door shall not exceed 0.5 cubic feet per minute of air per square foot of door area when tested in accordance with ASTM E 283.

2.3.5 Omitted

2.3.6 Provisions for Hardware

Hardware is specified in Section 08710, "Door Hardware." Deliver hardware templates and hardware (except field-applied hardware) to the door manufacturer for use in fabrication of aluminum doors and frames. Cut, reinforce, drill, and tap doors and frames at the factory to receive template hardware. Provide doors to receive surface-applied hardware, except push plates, kick plates, and mop plates, with reinforcing only; drill and tap in the field. Provide hardware reinforcements of stainless steel or steel with hot-dipped galvanized finish, and secure with stainless steel screws.

2.3.7 Provisions for Glazing

Provide extruded aluminum snap-in glazing beads on interior side of doors. Provide extruded aluminum, theft-proof, snap-in glazing beads or fixed

glazing beads on exterior or security side of doors. Glazing beads shall have vinyl insert glazing gaskets. Design glazing beads to receive glass of thickness indicated or specified. Glazing is specified in Section 08800, "Glazing."

2.3.8 Finishes

Provide exposed aluminum surfaces with factory finish of anodic coating or organic coating.

2.3.8.1 Anodic Coating

Clean exposed aluminum surfaces and provide an anodized finish conforming to AA DAF-45. Finish shall be anodized, designation AA-M10-C22-A42, Architectural Class I 0.7 mil or thicker. Color shall be dark bronze.

PART 3 EXECUTION

3.1 INSTALLATION

Hang doors to produce clearances specified in paragraph entitled "Aluminum Doors," of this section. After erection and glazing, adjust doors and hardware to operate properly.

3.2 PROTECTION FROM DISSIMILAR MATERIALS

3.2.1 Dissimilar Metals

Where aluminum surfaces come in contact with metals other than stainless steel, zinc, or small areas of white bronze, protect from direct contact by one or a combination of the following methods:

a. Paint the dissimilar metal with one coat of heavy-bodied bituminous paint.

b. Apply a good quality elastomeric sealant between the aluminum and the dissimilar metal.

c. Paint the dissimilar metal with one coat of primer and one coat of aluminum paint.

d. Use a nonabsorptive tape or gasket in permanently dry locations.

3.2.2 Drainage from Dissimilar Metals

In locations where drainage from dissimilar metals has direct contact with aluminum, provide protective paint, to prevent aluminum discoloration.

3.2.3 Masonry and Concrete

Provide aluminum surfaces in contact with mortar, concrete, or other masonry materials with one coat of heavy-bodied bituminous paint.

3.2.4 Wood or Other Absorptive Materials

Provide aluminum surfaces in contact with absorptive materials subject to frequent moisture, and aluminum surfaces in contact with treated wood, with two coats of aluminum paint or one coat of heavy-bodied bituminous paint. In lieu of painting the aluminum, the Contractor shall have the option of

painting the wood or other absorptive surface with two coats of aluminum paint and sealing the joints with elastomeric sealant.

3.3 CLEANING

Upon completion of installation, clean door and frame surfaces in accordance with door manufacturer's recommended procedure. Do not use abrasive, caustic, or acid cleaning agents.

3.4 PROTECTION

Protect doors and frames from damage and from contamination by other materials such as cement mortar. Prior to completion and acceptance of the work, restore damaged doors and frames to original condition, or replace with new ones.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 08 - DOORS AND WINDOWS

SECTION 08210

WOOD DOORS

09/99

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY, STORAGE, AND HANDLING
1.4 WARRANTY

PART 2 PRODUCTS

2.1 DOORS
2.1.1 Omitted
2.1.2 Flush Doors
2.1.2.1 Omitted
2.1.2.2 Interior Flush Doors
2.1.3 Omitted
2.1.4 Omitted
2.1.5 Omitted
2.1.6 Omitted
2.1.7 Composite-Type Fire Doors
2.2 ACCESSORIES
2.2.1 Omitted
2.2.2 Door Light Openings
2.2.3 Omitted
2.2.4 Additional Hardware Reinforcement
2.3 FABRICATION
2.3.1 Marking
2.3.2 Quality and Construction
2.3.3 Omitted
2.3.4 Adhesives and Bonds
2.3.5 Prefitting
2.3.6 Finishes
2.3.6.1 Omitted
2.3.6.2 Factory Finish
2.3.6.3 Omitted
2.3.6.4 Color
2.3.7 Water-Resistant Sealer
2.4 SOURCE QUALITY CONTROL

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Fire Doors

-- End of Section Table of Contents --

SECTION 08210

WOOD DOORS
09/99

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 152	(1981; Rev. A) Fire Tests of Door Assemblies

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI Qual Stds	(1997) Architectural Woodwork Quality Standards and Quality Certification Program

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1995) Fire Doors and Fire Windows
NFPA 252	(1995) Fire Tests of Door Assemblies

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S. 1-A	(1993) Architectural Wood Flush Doors
WDMA TM-5	(1990) Split Resistance Test
WDMA TM-7	(1990) Cycle - Slam Test
WDMA TM-8	(1990) Hinge Loading Resistance Test

UNDERWRITERS LABORATORIES (UL)

UL 10B	(1997) Fire Tests of Door Assemblies

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Doors; G, RO

Submit drawings or catalog data showing each type of door unit; descriptive data of head and jamb weatherstripping with installation instructions shall be included. Drawings and data shall indicate door type and construction, sizes, thickness,

methods of assembly, door louvers, and glazing.

SD-03 Product Data

Doors; G, RO

Accessories

Water-resistant sealer

Sample warranty

Fire resistance rating; G, RO

SD-04 Samples

Doors; G, AE

Prior to the delivery of wood doors, submit a sample section of each type of door which shows the stile, rail, veneer, finish, and core construction.

Door finish colors; G, RO

Submit a minimum of three color selection samples for selection by the Contracting Officer.

SD-06 Test Reports

Split resistance

Cycle-slam

Hinge loading resistance

Submit split resistance test report for doors tested in accordance with WDMA TM-5, cycle-slam test report for doors tested in accordance with WDMA TM-7, and hinge loading resistance test report for doors tested in accordance with WDMA TM-8.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver doors to the site in an undamaged condition and protect against damage and dampness. Stack doors flat under cover. Support on blocking, a minimum of 4 inches thick, located at each end and at the midpoint of the door. Store doors in a well-ventilated building so that they will not be exposed to excessive moisture, heat, dryness, direct sunlight, or extreme changes of temperature and humidity. Replace defective or damaged doors with new ones.

1.4 WARRANTY

Warranty shall warrant doors free of defects as set forth in the door manufacturer's standard door warranty.

PART 2 PRODUCTS

2.1 DOORS

Provide doors of the types, sizes, and designs indicated.

2.1.1 Omitted

2.1.2 Flush Doors

Flush doors shall conform to WDMA I.S. 1-A. Hollow core doors shall have lock blocks and one inch minimum thickness hinge stile. Stile edge bands of doors to receive natural finish shall be hardwood, compatible with face veneer. Stile edge bands of doors to be painted shall be mill option specie. No visible finger joints will be accepted in stile edge bands. When used, locate finger-joints under hardware.

2.1.2.1 Omitted

2.1.2.2 Interior Flush Doors

Provide particleboard core, Type II flush doors conforming to WDMA I.S. 1-A with faces of premium grade mahogany. Hardwood veneers shall be plain sliced slip book matched.

2.1.3 Omitted
2.1.4 Omitted
2.1.5 Omitted
2.1.6 Omitted

2.1.7 Composite-Type Fire Doors

Doors specified or indicated to have a fire resistance rating shall conform to the requirements of UL 10B, ASTM E 152, or NFPA 252 for the class of door indicated. Affix a permanent metal label with raised or incised markings indicating testing agency's name and approved hourly fire rating to hinge edge of each door.

2.2 ACCESSORIES

2.2.1 Omitted

2.2.2 Door Light Openings

Provide glazed openings in fire-rated doors with fire rated frames. Glazing is specified in Section 08800, "Glazing."

2.2.3 Omitted

2.2.4 Additional Hardware Reinforcement

Provide fire rated doors with hardware reinforcement blocking. Size of lock blocks shall be as required to secure the hardware specified. Top, bottom and intermediate rail blocks shall measure 5 inches minimum by full core width. Reinforcement blocking shall be in compliance with the manufacturer's labeling requirements and shall not be mineral material similar to the core.

2.3 FABRICATION

2.3.1 Marking

Each door shall bear a stamp, brand, or other identifying mark indicating quality and construction of the door.

2.3.2 Quality and Construction

Identify the standard on which the construction of the door was based, identify the standard under which preservative treatment was made, and identify doors having a Type I glue bond.

2.3.3 Omitted

2.3.4 Adhesives and Bonds

WDMA I.S. 1-A. Use Type II bond for interior doors. Adhesive for doors to receive a natural finish shall be nonstaining.

2.3.5 Prefitting

At the Contractor's option, doors may be provided factory pre-fit. Doors shall be sized and machined at the factory by the door manufacturer in accordance with the standards under which they are produced. The work shall include sizing, bevelling edges, mortising, and drilling for hardware and providing necessary beaded openings for glass and louvers. Provide the door manufacturer with the necessary hardware samples, and frame and hardware schedules as required to coordinate the work.

2.3.6 Finishes

2.3.6.1 Omitted

2.3.6.2 Factory Finish

Provide doors finished at the factory by the door manufacturer as follows: AWI Qual Stds Section 1500, specification for System No. 4 Conversion varnish alkyd urea or System No. 5 Vinyl catalyzed. The coating shall be AWI Qual Stds premium, medium rubbed sheen, open grain effect. Use stain when required to produce the finish specified for color. Seal edges, cutouts, trim, and wood accessories, and apply two coats of finish compatible with the door face finish. Touch-up finishes that are scratched or marred, or where exposed fastener holes are filled, in accordance with the door manufacturer's instructions. Match color and sheen of factory finish using materials compatible for field application.

2.3.6.3 Omitted

2.3.6.4 Color

Provide door finish colors as selected by the Contracting Officer from the color selection samples.

2.3.7 Water-Resistant Sealer

Provide a water-resistant sealer compatible with the specified finish as approved and as recommended by the door manufacturer.

2.4 SOURCE QUALITY CONTROL

Stiles of "B" and "C" label fire doors utilizing standard mortise leaf hinges shall meet the following performance criteria:

a. Split resistance: Average of ten test samples shall be not less than 500 pounds load when tested in accordance with WDMA TM-5.

b. Cycle-slam: 200,000 cycles with no loose hinge screws or other visible signs of failure when tested in accordance with the requirements of WDMA TM-7.

c. Hinge loading resistance: Average of ten test samples shall be not less than 700 pounds load when tested for direct screw withdrawal in accordance with WDMA TM-8 using a No. 12, 1 1/4 inch long, steel, fully threaded wood screw. Drill 5/32 inch pilot hole, use 1 1/2 inch opening around screw for bearing surface, and engage screw full, except for last 1/8 inch. Do not use a steel plate to reinforce screw area.

PART 3 EXECUTION

3.1 INSTALLATION

Before installation, seal top and bottom edges of doors with the approved water-resistant sealer. Seal cuts made on the job immediately after cutting using approved water-resistant sealer. Fit, trim, and hang doors with a 1/16 inch minimum, 1/8 inch maximum clearance at sides and top, and a 3/16 inch minimum, 1/4 inch maximum clearance over thresholds. Provide 3/8 inch minimum, 7/16 inch maximum clearance at bottom where no threshold occurs. Bevel edges of doors at the rate of 1/8 inch in 2 inches. Door warp shall not exceed 1/4 inch when measured in accordance with WDMA I.S. 1-A.

3.1.1 Fire Doors

Install fire doors in accordance with NFPA 80. Do not paint over labels.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 08 - DOORS AND WINDOWS

SECTION 08710

DOOR HARDWARE

02/02

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 HARDWARE SCHEDULE
1.4 KEY BITTING CHART REQUIREMENTS
1.5 QUALITY ASSURANCE
1.5.1 Hardware Manufacturers and Modifications
1.6 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 TEMPLATE HARDWARE
2.2 HARDWARE FOR FIRE DOORS AND EXIT DOORS
2.3 HARDWARE ITEMS
2.3.1 Hinges
2.3.2 Pivots
2.3.3 Spring Hinges
2.3.4 Locks and Latches
2.3.4.1 Mortise Locks and Latches
2.3.4.2 Electromagnetic Locks
2.3.5 Exit Devices
2.3.5.1 Omitted
2.3.5.2 Door Monitor Switch
2.3.6 Omitted
2.3.7 Cylinders and Cores
2.3.8 Keying System
2.3.9 Lock Trim
2.3.9.1 Push-Pull Set
2.3.9.2 Lever Handles
2.3.9.3 Texture
2.3.10 Keys
2.3.11 Door Bolts
2.3.12 Closers
2.3.12.1 Identification Marking
2.3.13 Overhead Holders
2.3.14 Closer Holder-Release Devices
2.3.15 Door Protection Plates
2.3.15.1 Sizes of Kick Plates
2.3.16 Omitted
2.3.17 Door Stops and Silencers
2.3.18 Omitted
2.3.19 Thresholds
2.3.20 Weather Stripping Gasketing
2.3.20.1 Extruded Aluminum Retainers
2.3.21 Omitted

2.3.22 Omitted
2.3.23 Special Tools
2.4 FASTENERS
2.5 FINISHES

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Weather Stripping Installation
3.1.1.1 Stop-Applied Weather Stripping
3.2 FIRE DOORS AND EXIT DOORS
3.3 HARDWARE LOCATIONS
3.4 KEY CABINET AND CONTROL SYSTEM
3.5 FIELD QUALITY CONTROL
3.6 HARDWARE SETS

-- End of Section Table of Contents --

SECTION 08710

DOOR HARDWARE
02/02

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 283	(1991) Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

BHMA A156.1	(1997) Butts and Hinges (BHMA 101)
BHMA A156.3	(1994) Exit Devices (BHMA 701)
BHMA A156.4	(1992) Door Controls - Closers (BHMA 301)
BHMA A156.6	(1994) Architectural Door Trim (BHMA 1001)
BHMA A156.7	(1988) Template Hinge Dimensions
BHMA A156.8	(1994) Door Controls - Overhead Holders (BHMA 311)
BHMA A156.13	(1994) Mortise Locks & Latches (BHMA 621)
BHMA A156.15	(1995) Closer Holder Release Devices
BHMA A156.16	(1997) Auxiliary Hardware
BHMA A156.17	(1993) Self Closing Hinges & Pivots
BHMA A156.18	(1993) Materials and Finishes (BHMA 1301)
BHMA A156.21	(1996) Thresholds
BHMA A156.22	(1996) Door Gasketing Systems
BHMA A156.23	(2004) Electromagnetic Locks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1999) Fire Doors and Fire Windows
NFPA 101	(1997) Life Safety Code

STEEL DOOR INSTITUTE (SDOI)

SDI 100 (1991) Standard Steel Doors and Frames

UNDERWRITERS LABORATORIES (UL)

UL Bld Mat Dir (1999) Building Materials Directory

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Hardware schedule; G, RO

Keying system

SD-03 Product Data

Hardware items; G, RO

SD-08 Manufacturer's Instructions

Installation

SD-10 Operation and Maintenance Data

Hardware Schedule items, Data Package 1; G, RO

Submit data package in accordance with Section 01781, "Operation and Maintenance Data."

SD-11 Closeout Submittals

Key bitting

1.3 HARDWARE SCHEDULE

Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (If fire rated and listed)	BHMA Finish Designation

1.4 KEY BITTING CHART REQUIREMENTS

Submit key bitting charts to the Contracting Officer prior to completion of the work. Include:

a. Complete listing of all keys (AA1, AA2, etc.).

b. Complete listing of all key cuts (AA1-123456, AA2-123458).

c. Tabulation showing which key fits which door.

d. Copy of floor plan showing doors and door numbers.

e. Listing of 20 percent more key cuts than are presently required in each master system.

1.5 QUALITY ASSURANCE

1.5.1 Hardware Manufacturers and Modifications

Provide, as far as feasible, locks, hinges, pivots, and closers of one lock, hinge, pivot, or closer manufacturer's make. Modify hardware as necessary to provide features indicated or specified.

1.6 DELIVERY, STORAGE, AND HANDLING

Deliver hardware in original individual containers, complete with necessary appurtenances including fasteners and instructions. Mark each individual container with item number as shown in hardware schedule. Deliver permanent keys and removable cores to the Contracting Officer, either directly or by certified mail. Deliver construction master keys with the locks.

PART 2 PRODUCTS

2.1 TEMPLATE HARDWARE

Hardware to be applied to metal or to prefinished doors shall be made to template. Promptly furnish template information or templates to door and frame manufacturers. Template hinges shall conform to BHMA A156.7. Coordinate hardware items to prevent interference with other hardware.

2.2 HARDWARE FOR FIRE DOORS AND EXIT DOORS

Provide all hardware necessary to meet the requirements of NFPA 80 for fire doors and NFPA 101 for exit doors, as well as to other requirements specified, even if such hardware is not specifically mentioned under paragraph entitled "Hardware Schedule." Such hardware shall bear the label of Underwriters Laboratories, Inc., and be listed in UL Bld Mat Dir or labeled and listed by another testing laboratory acceptable to the Contracting Officer.

2.3 HARDWARE ITEMS

Hinges, pivots, locks, latches, exit devices, bolts, and closers shall be clearly and permanently marked with the manufacturer's name or trademark where it will be visible after the item is installed. For closers with covers, the name or trademark may be beneath the cover.

2.3.1 Hinges

BHMA A156.1, 4 1/2 by 4 1/2 inches unless otherwise specified. Construct loose pin hinges for exterior doors and reverse-bevel interior doors so that pins will be nonremovable when door is closed. Other antifriction bearing hinges may be provided in lieu of ball-bearing hinges.

2.3.2 Pivots

BHMA A156.4.

2.3.3 Spring Hinges

BHMA A156.17.

2.3.4 Locks and Latches

2.3.4.1 Mortise Locks and Latches

BHMA A156.13, Series 1000, Operational Grade 1, Security Grade 2. Provide mortise locks with escutcheons not less than 7 by 2 1/4 inches with a bushing at least 1/4 inch long. Cut escutcheons to suit cylinders and provide trim items with straight, beveled, or smoothly rounded sides, corners, and edges. Levers shall match existing locksets, Yale PBLN8700.

2.3.4.2 Electromagnetic Locks

BHMA A156.23.

2.3.5 Exit Devices

BHMA A156.3, Grade 1. Provide adjustable strikes for rim type and vertical rod devices. Provide open back strikes for pairs of doors with mortise and vertical rod devices. Touch bars shall be provided in lieu of conventional crossbars and arms. Provide escutcheons, not less than 7 by 2 1/4 inches.

2.3.5.1 Omitted

2.3.5.2 Door Monitor Switch

Similar to Von Duprin MS764, concealed in head of door frame, 24 VDC, switch operation SPDT.

2.3.6 Omitted

2.3.7 Cylinders and Cores

Provide cylinders for new locks, including locks provided under other sections of this specification. Cores and keyways are to match existing 7-pin Best DD Keyway. Keying/biting shall match existing cores. ~~Cylinders shall be fully compatible with products of the Best Lock Corporation and shall have interchangeable cores which are removable by a special control key. The cores shall have seven pin tumblers and shall be factory set using the A4 system and F keyway.~~ Submit a core code sheet with the cores. The cores shall be master keyed in one system for this project. Provide construction interchangeable cores.

2.3.8 Keying System

Provide an extension of the existing keying system. Existing locks were manufactured by Best and have interchangeable cores. Provide construction interchangeable cores.

2.3.9 Lock Trim

Cast, forged, or heavy wrought construction and commercial plain design.

2.3.9.1 Push-Pull Set

BHMA 156.6, Type J504, similar to Rockwood 15847. 1 inch diameter stock, 12 inches CTC pull side, 32 inches CTC push side, 313 dark bronze anodized finish.

2.3.9.2 Lever Handles

Provide lever handles in lieu of knobs. Lever handles for exit devices shall meet the test requirements of BHMA A156.13 for mortise locks. Lever handle locks shall have a breakaway feature (such as a weakened spindle or a shear key) to prevent irreparable damage to the lock when a force in excess of that specified in BHMA A156.13 is applied to the lever handle. Lever handles shall return to within 1/2 inch of the door face. Match existing lever design, Yale PBLN8700.

2.3.9.3 Texture

Provide knurled or abrasive coated knobs or lever handles where specified in paragraph entitled "Hardware Schedule".

2.3.10 Keys

Furnish one file key, one duplicate key, and one working key for each key change and for each master and grand master keying system. Furnish one additional working key for each lock of each keyed-alike group. Furnish 4 great grand master keys, 4 construction master keys, and 2 control keys for removable cores. Furnish a quantity of key blanks equal to 20 percent of the total number of file keys. Stamp each key with appropriate key control symbol and "U.S. property - Do not duplicate." Do not place room number on keys.

2.3.11 Door Bolts

BHMA A156.16. Provide dustproof strikes for bottom bolts, except for doors having metal thresholds.

2.3.12 Closers

BHMA A156.4, Series C02000, Grade 1, with PT 4C. Provide with brackets, arms, mounting devices, fasteners, full size covers, except at storefront mounting, and other features necessary for the particular application. Size closers in accordance with manufacturer's recommendations, or provide multi-size closers, Sizes 1 through 6, and list sizes in the Hardware Schedule. Provide manufacturer's 10 year warranty.

BHMA A156.4, Series CO6000, Grade 1 for aluminum rail and stile doors.

2.3.12.1 Identification Marking

Engrave each closer with manufacturer's name or trademark, date of manufacture, and manufacturer's size designation located to be visible after installation.

2.3.13 Overhead Holders

BHMA A156.8.

2.3.14 Closer Holder-Release Devices

BHMA A156.15.

2.3.15 Door Protection Plates

BHMA A156.6.

2.3.15.1 Sizes of Kick Plates

Width for single doors shall be 2 inches less than door width; width for pairs of doors shall be one inch less than door width. Height of kick plates shall be 8 inches for flush doors.

2.3.16 Omitted

2.3.17 Door Stops and Silencers

BHMA A156.16. Silencers Type L03011. Provide three silencers for each single door, two for each pair.

2.3.18 Omitted

2.3.19 Thresholds

BHMA A156.21. Use J35100, with vinyl or silicone rubber insert in face of stop, for exterior doors opening out, unless specified otherwise.

2.3.20 Weather Stripping Gasketing

BHMA A156.22. Provide the type and function designation where specified in paragraph entitled "Hardware Schedule". A set shall include head and jamb seals, and, for pairs of doors, astragals. Air leakage of weather stripped doors shall not exceed 1.25 cubic feet per minute of air per square foot of door area when tested in accordance with ASTM E 283. Weather stripping shall be one of the following:

2.3.20.1 Extruded Aluminum Retainers

Extruded aluminum retainers not less than 0.050 inch wall thickness with vinyl, neoprene, silicone rubber, or polyurethane inserts. Aluminum shall be clear (natural) anodized.

2.3.21 Omitted
2.3.22 Omitted

2.3.23 Special Tools

Provide special tools, such as spanner and socket wrenches and dogging keys, required to service and adjust hardware items.

2.4 FASTENERS

Provide fasteners of proper type, quality, size, quantity, and finish with hardware. Fasteners exposed to weather shall be of nonferrous metal or stainless steel. Provide fasteners of type necessary to accomplish a permanent installation.

2.5 FINISHES

BHMA A156.18. Hardware shall have BHMA 630 finish (satin stainless steel), unless specified otherwise. Provide items not manufactured in stainless steel in BHMA 626 finish (satin chromium plated) over brass or bronze, except surface door closers which shall have aluminum paint finish, and except steel hinges which shall have BHMA 652 finish (satin chromium plated). Hinges for exterior doors shall be stainless steel with BHMA 630 finish or chromium plated brass or bronze with BHMA 626 finish. Exit devices may be provided in BHMA 626 finish in lieu of BHMA 630 finish except where BHMA 630 is specified under paragraph entitled "Hardware Sets". Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors.

~~2.6 KEY CABINET AND CONTROL SYSTEM~~

~~BHMA A156.5, Type required to yield a capacity (number of hooks) 10 percent greater than the number of key changes used for door locks.~~

PART 3 EXECUTION

3.1 INSTALLATION

Install hardware in accordance with manufacturers' printed instructions. Fasten hardware to wood surfaces with full-threaded wood screws or sheet metal screws. Provide machine screws set in expansion shields for fastening hardware to solid concrete and masonry surfaces. Provide toggle bolts where required for fastening to hollow core construction. Provide through bolts where necessary for satisfactory installation.

3.1.1 Weather Stripping Installation

Handle and install weather stripping so as to prevent damage. Provide full contact, weather-tight seals. Doors shall operate without binding.

3.1.1.1 Stop-Applied Weather Stripping

Fasten in place with color-matched sheet metal screws not more than 9 inches o.c. after doors and frames have been finish painted.

3.2 FIRE DOORS AND EXIT DOORS

Install hardware in accordance with NFPA 80 for fire doors, NFPA 101 for exit doors.

3.3 HARDWARE LOCATIONS

SDI 100, unless indicated or specified otherwise.

a. Kick and Armor Plates: Push side of single-acting doors. Both sides of double-acting doors.

3.4 KEY CABINET AND CONTROL SYSTEM

Locate where directed. Tag one set of file keys and one set of duplicate keys. Place other keys in appropriately marked envelopes, or tag each key. Furnish complete instructions for setup and use of key control system. On tags and envelopes, indicate door and room numbers or master or grand

master key.

3.5 FIELD QUALITY CONTROL

After installation, protect hardware from paint, stains, blemishes, and other damage until acceptance of work. Submit notice of testing 15 days before scheduled, so that testing can be witnessed by the Contracting Officer. Adjust hinges, locks, latches, bolts, holders, closers, and other items to operate properly. Demonstrate that permanent keys operate respective locks, and give keys to the Contracting Officer. Correct, repair, and finish, as directed, errors in cutting and fitting and damage to adjoining work.

3.6 HARDWARE SETS

Hardware for aluminum doors shall be provided under this section. Deliver Hardware templates and hardware, except field-applied hardware to the aluminum door and frame manufacturer for use in fabricating the doors and frames.

HW-1

1-1/2 Pair Hinges	A2111 x 652 x NRP
1 Exit Device	Type 1-14 x 626
1 Closer	C02011
1 Wall Bumper	L02251
1 Kick Plate	J102 x 630

HW-2

2 Pair Hinges	A5111 x 630 x NRP
1 Lockset	F07 x 630
1 Closer	C02021
1 Overhead Stop	C02511 x 630
1 Threshold	J35100 with insert
1 Set Weatherstripping	R3Y165
1 Kick Plate	J102 x 630

HW-3

4 Pair Hinges	A5111 x 630 x NRP, 5" x 5" hinges
1 Lockset	F07 x 630
2 Closers	C02021
2 Overhead Stops	C02511 x 630
2 Flush Bolts	L04021 x 630
1 Dust Proof Strike	L04021 x 630
1 Threshold	J35100 with insert
1 Set Weatherstripping	R3Y165
2 Kick Plates	J102 x 630

HW-4

1-1/2 Pair Hinges	A2111 x 652 x NRP
1 Exit Device	Type 1-14 x 626
1 Electromagnetic Lock	L08521 x 24V DC
1 Door Monitor Switch	Von Duprin MS 764
1 Closer	C02021
1 Wall Bumper	L02251
1 Kick Plate	J102 x 630

HW-5

3 Pair Hinges	A2111 x 652 x NRP
2 Exit Devices	Type 2-14 x 630
~~2 Electromagnetic Locks~~	~~L08521 x 24V DC~~
2 Door Monitor Switches	Von Duprin MS 764
2 Closers	C02011
2 Electromagnetic Holdopens	C00011
2 Kick Plates	J102 x 630

HW-6

2 Pair Hinges	A5111 x 630 x NRP, 5" x 5" hinges
1 Exit Device	Type 1-01 x 630
1 Door Monitor Switch	Von Duprin MS 764
1 Closers	C02021
1 Overhead Stops	C02511 x 630
1 Threshold	J35100 with insert
1 Set Weatherstripping	R3Y165
1 Kick Plate	J102 x 630

HW-7

2 Pair Hinges	A5111 x 630 x NRP, 5" x 5" hinges
1 Exit Device	Type 1-14 x 630
1 Electromagnetic Lock	L08521
1 Door Monitor Switch	Von Duprin MS 764
1 Closer	C02021
1 Overhead Stop	C02511 x 630
1 Threshold	J35100 with insert
1 Set Weatherstripping	R3Y165
1 Kick Plate	J102 x 630

HW-8

2 Floor Closers	C06011
2 Top Pivots	C07021
2 Door Pulls	J504 x 313, 12" CTC Pull, 33" CTC Push, 1" Diam.
2 Electromagnetic Locks	L08521
2 Door Monitor Switches	Von Duprin MS 764
1 Threshold	J35100 with insert

HW-9

4 Pair Hinges	A5111 x 630 x NRP
2 Exit Devices	Type 8-14 x 630
2 Electromagnetic Locks	L08521
2 Door Monitor Switches	Von Duprin MS 764
2 Closers	C02021
2 Overhead Stops	C02511 x 630
1 Threshold	J35100 with insert
1 Set Weatherstripping	R3Y165
2 Kick Plates	J102 x 630

HW-10

1 1/2 Pair Hinges	A2111 x 652 x NRP

1 Exit Device	Type 1-14 x 626
1 Closer	C02021
1 Overhead Stop	C02511 x 626
1 Kick Plate	J102 x 630

HW-11

2 Pair Hinges	A5111 x 630 x NRP
1 Lockset	F01 x 630
1 Electromagnetic Lock	L08521
1 Door Monitor Switch	Von Duprin MS 764
1 Closer	C02021
1 Overhead Stop	C02511 x 630
1 Threshold	J35100 with insert
1 Set Weatherstripping	R3Y165
1 Kick Plate	J102 x 630

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 08 - DOORS AND WINDOWS

SECTION 08800

GLAZING

10/03

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SYSTEM DESCRIPTION
1.4 DELIVERY, STORAGE, AND HANDLING
1.5 ENVIRONMENTAL REQUIREMENTS
1.6 WARRANTY

PART 2 PRODUCTS

2.1 GLASS
2.1.1 Omitted
2.1.2 Omitted
2.1.3 Omitted
2.1.4 Wired Glass
2.1.5 Omitted
2.1.6 Omitted
2.1.7 Omitted
2.1.8 Omitted
2.1.9 Omitted
2.1.10 Laminated Glass
2.2 OMITTED
2.3 OMITTED
2.4 SETTING AND SEALING MATERIALS
2.4.1 Omitted
2.4.2 Omitted
2.4.3 Sealants
2.4.3.1 Omitted
2.4.3.2 Structural Sealant
2.4.4 Omitted
2.4.5 Sealing Tapes
2.4.6 Setting Blocks and Edge Blocks
2.4.7 Glazing Gaskets
2.4.7.1 Omitted
2.4.7.2 Omitted
2.4.7.3 Aluminum Framing Glazing Gaskets
2.4.8 Accessories
2.5 OMITTED

PART 3 EXECUTION

3.1 PREPARATION
3.2 GLASS SETTING
3.2.1 Sheet Glass
3.2.2 Omitted

3.2.3 Omitted
3.2.4 Installation of Wire Glass
3.2.5 Omitted
3.2.6 Installation of Laminated Glass
3.3 OMITTED
3.4 CLEANING
3.5 PROTECTION

-- End of Section Table of Contents --

SECTION 08800

GLAZING
10/03

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z97.1	(1984; R 1994) Safety Glazing Materials Used in Buildings

ASTM INTERNATIONAL (ASTM)

ASTM C 1036	(2001) Flat Glass
ASTM C 1184	(2000ae1) Structural Silicone Sealants
ASTM D 395	(2003) Rubber Property - Compression Set
ASTM E 1300	(2003) Determining Load Resistance of Glass in Buildings
ASTM E 2010	(2001) Positive Pressure Fire Tests of Window Assemblies

GLASS ASSOCIATION OF NORTH AMERICA (GANA)

GANA Glazing Manual	(2004) Glazing Manual
GANA Sealant Manual	(1990) Sealant Manual

INSULATING GLASS MANUFACTURERS ALLIANCE (IGMA)

SIGMA TB-3001	(1990) Guidelines for Sloped Glazing
SIGMA TM-3000	(1997) Glazing Guidelines for Sealed Insulating Glass Units

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 252	(2003) Fire Tests of Door Assemblies
NFPA 257	(2000) Fire Test for Window and Glass Block Assemblies
NFPA 80	(1999) Fire Doors and Fire Windows

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

Installation

Drawings showing complete details of the proposed setting methods, mullion details, edge blocking, size of openings, frame details, materials, and types and thickness of glass.

SD-03 Product Data

Insulating Glass

Plastic Glazing

Glazing Accessories

Manufacturer's descriptive product data, handling and storage recommendations, installation instructions, and cleaning instructions.

SD-04 Samples

Insulating Glass

Plastic Sheet

Glazing Compound

Glazing Tape

Sealant

Two 8 x 10 inch samples of each of the following: tinted glass, patterned glass, heat-absorbing glass, and insulating glass units.

Three samples of each indicated material. Samples of plastic sheets shall be minimum 5 by 7 inches.

SD-08 Manufacturer's Instructions

Setting and sealing materials

Glass setting

Submit glass manufacturer's recommendations for setting and sealing materials and for installation of each type of glazing material specified.

1.3 SYSTEM DESCRIPTION

Glazing systems shall be fabricated and installed watertight and airtight

to withstand thermal movement and wind loading without glass breakage, gasket failure, deterioration of glazing accessories, and defects in the work. Glazed panels shall comply with the safety standards, as indicated in accordance with ANSI Z97.1. Glazed panels shall comply with indicated wind/snow loading in accordance with ASTM E 1300.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver products to the site in unopened containers, labeled plainly with manufacturers' names and brands. Store glass and setting materials in safe, enclosed dry locations and do not unpack until needed for installation. Handle and install materials in a manner that will protect them from damage.

1.5 ENVIRONMENTAL REQUIREMENTS

Do not start glazing work until the outdoor temperature is above40 degrees F and rising, unless procedures recommended by the glass manufacturer and approved by the Contracting Officer are made to warm the glass and rabbet surfaces. Provide ventilation to prevent condensation of moisture on glazing work during installation. Do not perform glazing work during damp or rainy weather.

1.6 WARRANTY

PART 2 PRODUCTS

2.1 GLASS

2.1.1 Omitted
2.1.2 Omitted
2.1.3 Omitted

2.1.4 Wired Glass

Glass for fire-rated windows shall be UL listed and shall be rated for 90 minutes when tested in acccordance with ASTM E 2010. Wired glass shall be Type II flat type, Class 1 - clear, Quality q8 - glazing, Form 1 - wired and polished both sides, conforming to ASTM C 1036. Wire mesh shall be polished stainless steel Mesh 1 - diamond. Wired glass for fire-rated windows shall bear an identifying UL label or the label of a nationally recognized testing agency, and shall be rated for 90 minutes when tested in accordance with NFPA 257. Wired glass for fire-rated doors shall be tested as part of a door assembly in accordance with NFPA 252.

2.1.5 Omitted
2.1.6 Omitted
2.1.7 Omitted
2.1.8 Omitted
2.1.9 Omitted

2.1.10 ~~Tempered~~Laminated Glass

~~ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class 1 (transparent), Quality q3, 1/4 inch thick, conforming to ASTM C 1048 and GANA Standards Manual. Color shall be clear.~~Provide laminated, tempered glass IAW to meet DOD minimum force protection standards. Color shall be bronze tinted to match existing. Provide at aluminum rail and stile doors.

2.2 OMITTED
2.3 OMITTED

2.4 SETTING AND SEALING MATERIALS

Provide as specified in the GANA Glazing Manual, SIGMA TM-3000, SIGMA TB-3001, and manufacturer's recommendations, unless specified otherwise herein. Do not use metal sash putty, nonskinning compounds, nonresilient preformed sealers, or impregnated preformed gaskets. Materials exposed to view and unpainted shall be gray or neutral color.

2.4.1 Omitted
2.4.2 Omitted

2.4.3 Sealants

Provide elastomeric and structural sealants.

2.4.3.1 Omitted

2.4.3.2 Structural Sealant

ASTM C 1184.

2.4.4 Omitted

2.4.5 Sealing Tapes

Preformed, semisolid, polymeric-based material of proper size and compressibility for the particular condition. Use only where glazing rabbet is designed for tape and tape is recommended by the glass or sealant manufacturer. Provide spacer shims for use with compressible tapes. Tapes shall be chemically compatible with the product being set.

2.4.6 Setting Blocks and Edge Blocks

Neoprene setting blocks shall be dense extruded type conforming to ASTM D 395, Method B, Shore A durometer between 70 and 90. Edge blocking shall be Shore A durometer of 50 (+ or - 5). Silicone setting blocks shall be required when blocks are in contact with silicone sealant. Profiles, lengths and locations shall be as required and recommended in writing by glass manufacturer.

2.4.7 Glazing Gaskets

2.4.7.1 Omitted
2.4.7.2 Omitted

2.4.7.3 Aluminum Framing Glazing Gaskets

Glazing gaskets for aluminum framing shall be permanent, elastic, non-shrinking, non-migrating, watertight and weathertight.

2.4.8 Accessories

Provide as required for a complete installation, including glazing points, clips, shims, angles, beads, and spacer strips. Provide noncorroding metal accessories. Provide primer-sealers and cleaners as recommended by the

glass and sealant manufacturers.

2.5 OMITTED

PART 3 EXECUTION

3.1 PREPARATION

Preparation, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, SIGMA TB-3001, SIGMA TM-3000, and manufacturer's recommendations. Determine the sizes to provide the required edge clearances by measuring the actual opening to receive the glass. Grind smooth in the shop glass edges that will be exposed in finish work. Leave labels in place until the installation is approved, except remove applied labels on heat-absorbing glass and on insulating glass units as soon as glass is installed. Securely fix movable items or keep in a closed and locked position until glazing compound has thoroughly set.

3.2 GLASS SETTING

Shop glaze or field glaze items to be glazed using glass of the quality and thickness specified or indicated. Glazing, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, SIGMA TB-3001, SIGMA TM-3000, and manufacturer's recommendations. Aluminum windows, wood doors, and wood windows may be glazed in conformance with one of the glazing methods described in the standards under which they are produced, except that face puttying with no bedding will not be permitted. Handle and install glazing materials in accordance with manufacturer's instructions. Use beads or stops which are furnished with items to be glazed to secure the glass in place.

3.2.1 Sheet Glass

Cut and set with the visible lines or waves horizontal.

3.2.2 Omitted
3.2.3 Omitted

3.2.4 Installation of Wire Glass

Install glass for fire doors in accordance with installation requirements of NFPA 80.

3.2.5 Omitted

3.2.6 Installation of Laminated Glass

Sashes which are to receive laminated glass shall be weeped to the outside to allow water drainage into the channel.

3.3 OMITTED

3.4 CLEANING

Clean glass surfaces and remove labels, paint spots, putty, and other defacement as required to prevent staining. Glass shall be clean at the time the work is accepted.

3.5 PROTECTION

Glass work shall be protected immediately after installation. Glazed openings shall be identified with suitable warning tapes, cloth or paper flags, attached with non-staining adhesives. Reflective glass shall be protected with a protective material to eliminate any contamination of the reflective coating. Protective material shall be placed far enough away from the coated glass to allow air to circulate to reduce heat buildup and moisture accumulation on the glass. Glass units which are broken, chipped, cracked, abraded, or otherwise damaged during construction activities shall be removed and replaced with new units.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09000

BUILDING COLOR AND FINISH SCHEDULE

PART 1 GENERAL

1.1 SUMMARY
1.2 REFERENCES TO MANUFACTURERS AND PRODUCTS
1.3 ABBREVIATIONS: MANUFACTURERS AND MATERIALS

PART 2 PRODUCTS (NOT USED)

PART 3 NOT USED

-- End of Section Table of Contents --

SECTION 09000

BUILDING COLOR AND FINISH SCHEDULE

PART 1 GENERAL

1.1 SUMMARY

This section covers colors, patterns, and textures of exterior and interior floor, wall, ceiling, and equipment finish materials.

1.2 REFERENCES TO MANUFACTURERS AND PRODUCTS

The manufacturer's names and their products referenced in this section only indicate the color, texture, and pattern required for the materials listed. The products furnished shall meet the color, texture, and pattern indicated as well as the material quality and performance specified in the applicable technical sections. The use of manufacturer's names and products do not preclude the use of other manufacturer's products of approved equal color, texture, or pattern as long as all requirements are met.

1.3 ABBREVIATIONS: MANUFACTURERS AND MATERIALS

Abbrev.	Material	Manufacturer	Mfgr's No/Color
FWC-1	Fabric Wallcovering	Knoll Textiles 1-800-343-5665	Odeon, WC317/9 Anthracite 100% Vinyl Coated Polyester, Class A 54" Wide, No repeat ***Note: Request acrylic backing***
FWC-2	Fabric Wallcovering	Maharam 1-800-645-3943	Tek-Wall 395770 0005 Olivine, 100% Polyolefin, 54" Wide, Teflon Acrylic Backing
FWP-2	Fabric Wallcovering	Knoll Textiles 1-800-343-5665	Metaphor, WC612/6B Ochre, 52% Polyester, 48% PVC, Class A, 55" Wide, No repeat ***Note: Request acrylic backing***
VWC-1	Vinyl Wallcovering	Eykon 1-800-222-7866	Darjeeling 2VKP-17 Pale Gold, Type II, Class A 54" Wide, 5/8" V. match; Reverse hang
WV-1	Wood Veneer	AWPC 1-800-964-7804	Makore, Quarter Figured, Slip Matched, Matte Laquer finish for high traffic ***Note: Direction of grain is indicated on elevation plans***

B-1	Wood Base	(Existing)	6" wood base ***Note: Stain or Paint finish per Finish Schedule***
B-2	Rubber Base	Johnsonite	4" Cove, 63 Burnt Umber
PT-1	Paint	Sherwin-Williams	Harmony, SW6364 Eggwhite, Satin Eggshell Finish
PT-2	Paint	Sherwin-Williams	Harmony, SW6364 Eggwhite, Semi-Gloss Finish
PT-3	Paint	Benjamin Moore	Pristine Eco Spec, HC-34 Wilmington Tan, Latex Eggshell Enamel Finish 223
PT-4	Paint	Benjamin Moore	Pristine Eco Spec, HC-34 Wilmington Tan, Latex Semi-Gloss Enamel 224
PT-5	Paint	Benjamin Moore	Pristine Eco Spec, Gray 2121-10, Latex Flat 219
PT-6	Paint	Benjamin Moore	Pristine Eco Spec, Space Back 2119-10, Latex Semigloss Enamel 224
PT-7	Paint	Bollen International (972)478-2838	Ferroxtone-W, FX-400 Med. Light St. Steel
PT-8	Paint	Benjamin Moore	Pristine Eco Spec, Wheeling Neutral HC-92, Latex Semi-Gloss Enamel 224
PT-9	Paint	Benjamin Moore	Pristine Eco Spec, Regent Green 2136-20, Latex Semi-Gloss Enamel 224
MT-1	Metal Cladding	Forms & Surfaces 1-800-451-8626	Stainless Steel, Linen Finish Tech Pattern
MT-2	Metal Cladding	Forms & Surfaces 1-800-451-8626	Stainless Steel, Fused Nickel Silver, Sandstone Finish
CG-1	Corner Guard	CS Acrovyn	CO-8, 90 degrees, Mill Finished Aluminum, 3-1/2" Wings ***Note: 10' stock length to be cut in field***
CR-1	Crash Rail	CS Acrovyn	SCR-16SS, 5-1/2"

VS-1	Vertical Surfacing Panel System	Gage Corporation 1-800-786-4243	GC120 (SS/Blk) ***Note: 4' x 8' sheets to be cut in field per pattern on plans***
WC-1	Wood Cube Ceiling	Rulon 1-800-227-8566	Continuous, 6" cell, 3/8" Th. x 3"H. wood blade, Class A, Maple wood with water based wood stain to match (WV-1)

NOTE: VWC-1 is to be applied to existing demountable partitions. This work shall be shown as a separate item in all construction bids and proposals, and not included in the total cost of construction. Manufacturer of demountable partitions is as follows:

KI
Mr. Bob Wittl
KI Wall Department Manager
(920)406-3471
(920)468-2743 (FAX)
rob.wittl@ki.com

PART 2 PRODUCTS (NOT USED)

PART 3 NOT USED

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09100N

METAL SUPPORT ASSEMBLIES

09/99

PART 1 GENERAL

1.1 REFERENCES
1.2 OMITTED
1.3 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Materials for Attachment of Lath
2.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring
2.1.1.2 Nonload-Bearing Wall Framing
2.1.2 Materials for Attachment of Gypsum Wallboard
2.1.2.1 Suspended and Furred Ceiling Systems
2.1.2.2 Nonload-Bearing Wall Framing and Furring
2.1.2.3 Furring Structural Steel Columns
2.1.2.4 Z-Furring Channels

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Systems for Attachment of Lath
3.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring
3.1.1.2 Nonload-Bearing Wall Framing
3.1.2 Systems for Attachment of Gypsum Wallboard
3.1.2.1 Suspended and Furred Ceiling Systems
3.1.2.2 Nonload-Bearing Wall Framing and Furring
3.1.2.3 Furring Structural Steel Columns
3.1.2.4 Z-Furring Channels
3.2 ERECTION TOLERANCES

-- End of Section Table of Contents --

SECTION 09100N

METAL SUPPORT ASSEMBLIES
09/99

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 463/A 463M	(1997; Rev. A) Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A 653/A 653M	(1998) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C 645	(1998) Nonstructural Steel Framing Members
ASTM C 754	(1997) Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
ASTM C 841	(1997) Installation of Interior Lathing and Furring

METAL LATH/STEEL FRAMING ASSOCIATION (ML/SFA)

NAAMM ML/SFA MLF	(1991) Metal Lathing and Furring

UNDERWRITERS LABORATORIES (UL)

UL Fire Resist Dir	(1997) Fire Resistance Directory

1.2 OMITTED

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the job site and store in ventilated dry locations. Storage area shall permit easy access for inspection and handling. If materials are stored outdoors, stack materials off the ground, supported on a level platform, and fully protected from the weather. Handle materials carefully to prevent damage. Remove damaged items and provide new items.

PART 2 PRODUCTS

2.1 MATERIALS

Provide steel materials for metal support systems with galvanized coating ASTM A 653/A 653M, G-60; aluminum coating ASTM A 463/A 463M, T1-25; or a 55-percent aluminum-zinc coating.

2.1.1 Materials for Attachment of Lath

2.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring

ASTM C 841.

2.1.1.2 Nonload-Bearing Wall Framing

NAAMM ML/SFA MLF.

2.1.2 Materials for Attachment of Gypsum Wallboard

2.1.2.1 Suspended and Furred Ceiling Systems

ASTM C 645.

2.1.2.2 Nonload-Bearing Wall Framing and Furring

ASTM C 645, but not thinner than 0.0179 inch thickess, with 0.0329 inch minimum thickness supporting wall hung items such as cabinetwork, equipment and fixtures.

2.1.2.3 Furring Structural Steel Columns

ASTM C 645. Steel (furring) clips and support angles listed in UL Fire Resist Dir may be provided in lieu of steel studs for erection of gypsum wallboard around structural steel columns.

2.1.2.4 Z-Furring Channels

Not lighter than 26 gage galvanized steel, Z-shaped, with 1 1/4 inch and 3/4 inch flanges and 1 inch furring depth.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Systems for Attachment of Lath

3.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring

ASTM C 841, except as indicated otherwise.

3.1.1.2 Nonload-Bearing Wall Framing

NAAMM ML/SFA MLF, except that framing members shall be 16 inches o.c. unless indicated otherwise.

3.1.2 Systems for Attachment of Gypsum Wallboard

3.1.2.1 Suspended and Furred Ceiling Systems

ASTM C 754, except that framing members shall be 16 inches o.c. unless indicated otherwise.

3.1.2.2 Nonload-Bearing Wall Framing and Furring

ASTM C 754, except as indicated otherwise.

3.1.2.3 Furring Structural Steel Columns

Install studs or galvanized steel clips and support angles for erection of gypsum wallboard around structural steel columns in accordance with the UL Fire Resist Dir, design number(s) of the fire resistance rating indicated.

3.1.2.4 Z-Furring Channels

Install Z-furring channels vertically spaced not more than 24 inches o.c. Locate Z-furring channels at interior and exterior corners in accordance with manufacturer's printed erection instructions. Fasten furring channels to masonry and concrete walls with powder-driven fasteners or hardened concrete steel nails through narrow flange of channel. Space fasteners not more than 24 inches o.c.

3.2 ERECTION TOLERANCES

Framing members which will be covered by finish materials such as wallboard, plaster, or ceramic tile set in a mortar setting bed, shall be within the following limits:

a. Layout of walls and partitions: 1/4 inch from intended position;

b. Plates and runners: 1/4 inch in 8 feet from a straight line;

c. Studs: 1/4 inch in 8 feet out of plumb, not cumulative; and

d. Face of framing members: 1/4 inch in 8 feet from a true plane.

Framing members which will be covered by ceramic tile set in dry-set mortar, latex-portland cement mortar, or organic adhesive shall be within the following limits:

a. Layout of walls and partitions: 1/4 inch from intended position;

b. Plates and runners: 1/8 inch in 8 feet from a straight line;

c. Studs: 1/8 inch in 8 feet out of plumb, not cumulative; and

d. Face of framing members: 1/8 inch in 8 feet from a true plane.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09250

GYPSUM BOARD

11/01

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY, STORAGE, AND HANDLING
1.3.1 Delivery
1.3.2 Storage
1.3.3 Handling
1.4 ENVIRONMENTAL CONDITIONS
1.4.1 Temperature
1.4.2 Exposure to Weather
1.5 QUALIFICATIONS

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Gypsum Board
2.1.1.1 Regular
2.1.1.2 Foil-Backed
2.1.1.3 Type X (Special Fire-Resistant)
2.1.2 Omitted
2.1.3 Omitted
2.1.4 Omitted
2.1.5 Omitted
2.1.6 Omitted
2.1.7 Omitted
2.1.8 Omitted
2.1.9 Joint Treatment Materials
2.1.9.1 Embedding Compound
2.1.9.2 Finishing or Topping Compound
2.1.9.3 All-Purpose Compound
2.1.9.4 Setting or Hardening Type Compound
2.1.9.5 Joint Tape
2.1.10 Fasteners
2.1.10.1 Nails
2.1.10.2 Screws
2.1.10.3 Staples
2.1.11 Adhesives
2.1.11.1 Adhesive for Fastening Gypsum Board to Metal Framing
2.1.11.2 Adhesive for Fastening Gypsum Board to Wood Framing
2.1.11.3 Adhesive for Laminating
2.1.12 Omitted
2.1.13 Omitted
2.1.14 Accessories
2.1.15 Omitted
2.1.16 Water

PART 3 EXECUTION

3.1 EXAMINATION
3.1.1 Framing and Furring
3.1.2 Gypsum Board
3.2 APPLICATION OF GYPSUM BOARD
3.2.1 Omitted
3.2.2 Omitted
3.2.3 Omitted
3.2.4 Omitted
3.2.5 Omitted
3.2.6 Omitted
3.2.7 Application of Gypsum Board to Steel Framing and Furring
3.2.8 Arches and Bending Radii
3.2.9 Omitted
3.2.10 Omitted
3.2.11 Omitted
3.2.12 Floating Interior Angles
3.2.13 Control Joints
3.3 APPLICATION OF CEMENTITIOUS BACKER UNITS
3.3.1 Omitted
3.3.2 Joint Treatment
3.4 FINISHING OF GYPSUM BOARD
3.4.1 Uniform Surface
3.5 SEALING
3.6 FIRE-RESISTANT ASSEMBLIES
3.7 PATCHING

-- End of Section Table of Contents --

SECTION 09250

GYPSUM BOARD
11/01

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A108.11	(1992) Interior Installation of Cementitious Backer Units

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 36/C 36M	(1999) Gypsum Wallboard
ASTM C 475	(1994) Joint Compound and Joint Tape for Finishing Gypsum Board
ASTM C 514	(1996) Nails for the Application of Gypsum Board
ASTM C 557	(1999) Adhesives for Fastening Gypsum Wallboard to Wood Framing
ASTM C 630/C 630M	(2001) Water-Resistant Gypsum Backing Board
ASTM C 840	(2001) Application and Finishing of Gypsum Board
ASTM C 954	(2000) Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
ASTM C 1002	(2000) Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases
ASTM C 1047	(1999) Accessories for Gypsum Wallboard and Gypsum Veneer Base
ASTM C 1396/C 1396M	(2000) Standard Specification for Gypsum Board

GYPSUM ASSOCIATION (GA)

GA 214	(1996) Recommended Levels of Gypsum Board Finish

GA 216 (2000) Application and Finishing of Gypsum Board

UNDERWRITERS LABORATORIES (UL)

UL Fire Resist Dir (2000) Fire Resistance Directory

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-07 Certificates

Asbestos Free Materials;

Certify that gypsum board types, gypsum backing board types, cementitious backer units, and joint treating materials do not contain asbestos.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery

Deliver materials in the original packages, containers, or bundles with each bearing the brand name, applicable standard designation, and name of manufacturer, or supplier.

1.3.2 Storage

Keep materials dry by storing inside a sheltered building. Where necessary to store gypsum board and cementitious backer units outside, store off the ground, properly supported on a level platform, and protected from direct exposure to rain, snow, sunlight, and other extreme weather conditions. Provide adequate ventilation to prevent condensation.

1.3.3 Handling

Neatly stack gypsum board and cementitious backer units flat to prevent sagging or damage to the edges, ends, and surfaces.

1.4 ENVIRONMENTAL CONDITIONS

1.4.1 Temperature

Maintain a uniform temperature of not less than 50 degrees F in the structure for at least 48 hours prior to, during, and following the application of gypsum board, cementitious backer units, and joint treatment materials, or the bonding of adhesives.

1.4.2 Exposure to Weather

Protect gypsum board and cementitious backer unit products from direct exposure to rain, snow, sunlight, and other extreme weather conditions.

1.5 QUALIFICATIONS

Manufacturer shall specialize in manufacturing the types of material specified and shall have a minimum of 5 years of documented successful experience. Installer shall specialize in the type of gypsum board work required and shall have a minimum of 3 years of documented successful experience.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to specifications, standards and requirements specified herein. Provide gypsum board types, gypsum backing board types, cementitious backing units, and joint treating materials manufactured from asbestos free materials only.

2.1.1 Gypsum Board

ASTM C 36/C 36M and ASTM C 1396/C 1396M.

2.1.1.1 Regular

48 inches wide, 5/8 inch thick, tapered and featured edges.

2.1.1.2 Foil-Backed

48 inches wide, 5/8 inch thick, tapered and featured edges.

2.1.1.3 Type X (Special Fire-Resistant)

48 inches wide, 5/8 inch thick, tapered and featured edges.

2.1.2 Omitted
2.1.3 Omitted
2.1.4 Omitted
2.1.5 Omitted
2.1.6 Omitted
2.1.7 Omitted
2.1.8 Omitted

2.1.9 Joint Treatment Materials

ASTM C 475.

2.1.9.1 Embedding Compound

Specifically formulated and manufactured for use in embedding tape at gypsum board joints and compatible with tape, substrate and fasteners.

2.1.9.2 Finishing or Topping Compound

Specifically formulated and manufactured for use as a finishing compound.

2.1.9.3 All-Purpose Compound

Specifically formulated and manufactured to serve as both a taping and a finishing compound and compatible with tape, substrate and fasteners.

2.1.9.4 Setting or Hardening Type Compound

Specifically formulated and manufactured for use with fiber glass mesh tape.

2.1.9.5 Joint Tape

Cross-laminated, tapered edge, reinforced paper, or fiber glass mesh tape recommended by the manufacturer.

2.1.10 Fasteners

2.1.10.1 Nails

ASTM C 514.

2.1.10.2 Screws

ASTM C 1002, Type "G", Type "S" or Type "W" steel drill screws for fastening gypsum board to gypsum board, wood framing members and steel framing members less than 0.033 inch thick. ASTM C 954 steel drill screws for fastening gypsum board to steel framing members 0.033 to 0.112 inch thick. Provide cementitious backer unit screws with a polymer coating.

2.1.10.3 Staples

No. 16 USS gage flattened galvanized wire staples with 7/16 inch wide crown outside measurement and divergent point for base ply of two-ply gypsum board application. Use as follows:

Length of Legs (inch)	Thickness of Gypsum Board (inch)
1 1/8	1/2
1 1/4	5/8

2.1.11 Adhesives

Do not use adhesive containing benzene, carbon tetrachloride, or trichloroethylene.

2.1.11.1 Adhesive for Fastening Gypsum Board to Metal Framing

Type recommended by gypsum board manufacturer.

2.1.11.2 Adhesive for Fastening Gypsum Board to Wood Framing

ASTM C 557.

2.1.11.3 Adhesive for Laminating

For laminating two-ply gypsum board systems, provide adhesive recommended by gypsum board manufacturer.

2.1.12 Omitted
2.1.13 Omitted

2.1.14 Accessories

ASTM C 1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not

acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials.

2.1.15 Omitted

2.1.16 Water

Clean, fresh, and potable.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Framing and Furring

Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board and cementitious backer units. Verify that all blocking, headers and supports are in place to support plumbing fixtures and to receive soap dishes, grab bars, towel racks, and similar items. Do not proceed with work until framing and furring are acceptable for application of gypsum board and cementitious backer units.

3.1.2 Gypsum Board

Verify that surfaces of gypsum board to be bonded with an adhesive are free of dust, dirt, grease, and any other foreign matter. Do not proceed with work until surfaces are acceptable for application of gypsum board with adhesive.

3.2 APPLICATION OF GYPSUM BOARD

Apply gypsum board to framing and furring members in accordance with ASTM C 840 or GA 216 and the requirements specified herein. Apply gypsum board with separate panels in moderate contact; do not force in place. Stagger end joints of adjoining panels. Neatly fit abutting end and edge joints. Use gypsum board of maximum practical length. Cut out gypsum board as required to make neat close joints around openings. In vertical application of gypsum board, provide panels in lengths required to reach full height of vertical surfaces in one continuous piece. Surfaces of gypsum board and substrate members may be bonded together with an adhesive, except where prohibited by fire rating(s). Treat edges of cutouts for plumbing pipes, screwheads, and joints with water-resistant compound as recommended by the gypsum board manufacturer. Provide type of gypsum board for use in each system specified herein as indicated.

3.2.1 Omitted
3.2.2 Omitted
3.2.3 Omitted
3.2.4 Omitted
3.2.5 Omitted
3.2.6 Omitted

3.2.7 Application of Gypsum Board to Steel Framing and Furring

Apply in accordance with ASTM C 840, System VIII or GA 216.

3.2.8 Arches and Bending Radii

Apply gypsum board in accordance with ASTM C 840, System IX or GA 216.

3.2.9 Omitted
3.2.10 Omitted
3.2.11 Omitted

3.2.12 Floating Interior Angles

Locate the attachment fasteners adjacent to ceiling and wall intersections in accordance with ASTM C 840, System XII or GA 216, for single-ply and two-ply applications of gypsum board to wood framing.

3.2.13 Control Joints

Install expansion and contraction joints in ceilings and walls in accordance with ASTM C 840, System XIII or GA 216, unless indicated otherwise. Control joints between studs in fire-rated construction shall be filled with firesafing insulation to match the fire-rating of construction.

3.3 APPLICATION OF CEMENTITIOUS BACKER UNITS

3.3.1 Omitted

3.3.2 Joint Treatment

ANSI A108.11.

3.4 FINISHING OF GYPSUM BOARD

Tape and finish gypsum board in accordance with ASTM C 840, GA 214 and GA 216. Plenum areas above ceilings shall be finished to Level 1 in accordance with GA 214. Water resistant gypsum backing board, ASTM C 630/C 630M, to receive ceramic tile shall be finished to Level 2 in accordance with GA 214. Walls and ceilings to receive a heavy-grade wall covering or heave textured finish before painting shall be finished to Level 3 in accordance with GA 214. Walls and ceilings without critical lighting to receive flat paints, light textures, or wall coverings shall be finished to Level 4 in accordance with GA 214. Unless otherwise specified, all gypsum board walls, partitions and ceilings shall be finished to Level 5 in accordance with GA 214. Provide joint, fastener depression, and corner treatment. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

3.4.1 Uniform Surface

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, or where severe, up or down lighting conditions occur, finish gypsum wall surface in accordance to GA 214 Level 5. In accordance with GA 214 Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.

3.5 SEALING

Seal openings around pipes, fixtures, and other items projecting through gypsum board and cementitious backer units. Apply material with exposed surface flush with gypsum board or cementitious backer units.

3.6 FIRE-RESISTANT ASSEMBLIES

Wherever fire-rated construction is indicated, provide materials and application methods, including types and spacing of fasteners, wall and ceiling framing in accordance with the specifications contained in UL Fire Resist Dir for the Design Number(s) indicated. Joints of fire-rated gypsum board enclosures shall be closed and sealed in accordance with UL test requirements or GA requirements. Penetrations through rated partitions and ceilings shall be sealed tight in accordance with tested systems. Fire ratings shall be as indicated.

3.7 PATCHING

Patch surface defects in gypsum board to a smooth, uniform appearance, ready to receive finish as specified.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09720

WALLCOVERINGS

07/02

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY AND STORAGE
1.4 ENVIRONMENTAL REQUIREMENTS
1.5 WARRANTY

PART 2 PRODUCTS

2.1 WALLCOVERINGS
2.1.1 Vinyl Wallcovering Type VWC-1
2.1.2 Fabric Wallcovering Type FWC-1
2.1.3 Fabric Wallcovering Type FWC-2
2.1.4 Fabric Wallcovering Type FWP-1
2.2 OMITTED
2.3 OMITTED
2.4 OMITTED
2.5 PRIMER AND ADHESIVE
2.6 COLOR, TEXTURE, AND PATTERN

PART 3 EXECUTION

3.1 EXAMINATION
3.2 SURFACE PREPARATION
3.3 INSTALLATION
3.3.1 Omitted
3.3.2 Vinyl and Fabric Wallcovering
3.3.3 Corner Guards
3.4 CLEAN-UP

-- End of Section Table of Contents --

SECTION 09720

WALLCOVERINGS
07/02

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 E 84	(2001) Surface Burning Characteristics of Building Materials
ASTM F 793	(1993; R 1998) Standard Classification of Wallcovering by Durability Characteristics

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Wallcoverings;

Manufacturer's descriptive data, documentation stating physical characteristics, flame resistance, mildew and germicidal characteristics.

Installation;

Preprinted installation instructions for wallcovering and accessories.

Maintenance;
Clean-Up;

Preprinted cleaning and maintenance instructions for wallcovering and accessories.

SD-04 Samples

Wallcoverings; G, AE

Three samples of each indicated type, pattern, and color of wallcovering. Samples of wall covering shall be minimum 5 x 7

inches and of sufficient size to show pattern repeat.

SD-07 Certificates

Wallcoverings; G, RO

Manufacturer's statement attesting that the product furnished meets or exceeds specification requirements. The statement must; be dated after the award of the contract, state Contractor's name and address, name the project and location, and list the requirements being certified.

SD-08 Manufacturer's Instructions

Wallcoverings;

Submit complete procedures for an expert installation, including preparation of the substrate. Submit Material Safety Data Sheets (MSDS) for all primers, sealers, and adhesives to the Contracting Officer.

SD-10 Operation and Maintenance Data

Wallcoverings, Data Package 1;

Submit operation and maintenance data in accordance with Section 01781 OPERATION AND MAINTENANCE DATA.

1.3 DELIVERY AND STORAGE

Deliver the material to the site in manufacturer's original wrappings and packages and clearly labeled with the manufacturer's name, brand name, size, and other related information. Store in a safe, dry, clean, and well-ventilated area at temperatures not less than 50 degrees F and within a relative humidity range of 30 to 60 percent. Store wall covering material in a flat position and protect from damage, soiling, and moisture. Do not open containers until needed for installation, unless verification inspection is required.

1.4 ENVIRONMENTAL REQUIREMENTS

Minimum temperature of area to receive wall covering, before, during, and after installation, and requirements for conditioning adhesive and wall covering shall comply with the wall covering manufacturer's printed instructions. However, in no case shall the area temperature be less than 50 degrees F, 72 hours prior to, during installation, and until the adhesive is dry. Observe ventilation and safety procedures specified in the MSDS.

1.5 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one-year period shall be provided.

PART 2 PRODUCTS

2.1 WALLCOVERINGS

Wallcoverings shall be material designed specifically for the specified

use. The wallcovering shall contain a non-mercury based mildewcide. The wallcovering shall be type made without the use of cadmium based stabilizers. Wallcovering shall have a Class A flame spread rating of 0-25 and smoke development rating of 0-50 when tested in accordance with ASTM E 84. See Section 09000, BUILDING COLOR AND FINISH SCHEDULE for manufactaurer and product references for materials specified in this Section.

2.1.1 Vinyl Wallcovering Type VWC-1

Vinyl wallcovering shall be a vinyl coated woven or nonwoven fabric with germicidal additives and shall conform to ASTM F 793, Category V Type II, (13.1 to 24 ounces) total weight per square yard and width of 54 inches.

2.1.2 Fabric Wallcovering Type FWC-1

Fabric wallcovering shall be a woven fabric with paper or acrylic backing and shall be colorfast, stain, and soil resistant. Fabric wallcovering shall meet or exceed the following:

a. Face fiber content: 100% vinyl-coated polyester.

b. Total weight: 21 ounces per square yard.

c. Width: 54 inches.

2.1.3 Fabric Wallcovering Type FWC-2

Fabric wallcovering shall be a woven fabric with paper or acrylic backing and shall be colorfast, stain, and soil resistant. Fabric wallcovering shall meet or exceed the following:

a. Face fiber content: 100% Polyolefin.

b. Total weight: 8.12 ounces per square yard.

c. Width: 54 inches.

2.1.4 Fabric Wallcovering Type FWP-1

Fabric wallcovering shall be a woven fabric with paper or acrylic backing and shall be colorfast, stain, and soil resistant. Fabric wallcovering shall meet or exceed the following:

a. Face fiber content: 52% polyester; 48% PVC.

b. Total weight: 16 ounces per square yard.

c. Width: 55 inches.

2.2 OMITTED
2.3 OMITTED
2.4 OMITTED

2.5 PRIMER AND ADHESIVE

Primer and adhesive shall be of a type recommended by the wallcovering manufacturer and shall contain a non-mercury based mildewcide. When substrate color variations show through vinyl wallcovering, a white

pigmented primer as recommended by the wallcovering manufacturer shall be used to conceal the variations. Adhesive shall be strippable type.

2.6 COLOR, TEXTURE, AND PATTERN

Color, texture, and pattern shall be in accordance with manufacturer and product references in Section 09000 BUILDING COLOR AND FINISH SCHEDULE.

PART 3 EXECUTION

3.1 EXAMINATION

Contractor shall inspect all areas and conditions under which wallcoverings are to be installed. Contractor shall notify in writing of any conditions detrimental to the proper and timely completion of the installation. Work will proceed only when conditions have been corrected and accepted by the installer.

3.2 SURFACE PREPARATION

Wallcovering shall not be applied to surfaces that are rough, that contain stains that will bleed through the wallcovering, or that are otherwise unsuitable for proper installation. Cracks and holes shall be filled and rough spots shall be sanded smooth. Surfaces to receive wallcovering shall be thoroughly dry. Plaster surfaces shall age at least 30 days prior to installation of vinyl wallcoverings. Interior surfaces of new and existing gypsum wallboard shall be primed with a wallcovering primer in accordance with the manufacturer's instructions. As required, white primer shall be used when substrate color variations are visible through thin or light color wallcovering. Interior surfaces of exterior masonry walls shall be sealed to prevent moisture penetration, then primed with a wallcovering primer in accordance with the manufacturer's instructions. Moisture content of plaster, concrete, and masonry shall be tested with an electric moisture meter and reading shall be not more than 5 percent. Masonry walls shall have flush joints. Concrete and masonry walls shall be coated with a thin coat of joint compound or cement plaster as a substrate preparation. To promote adequate adhesion of wall lining over masonry walls, the walls shall be primed as recommended by the wall lining manufacturer. Surface of walls shall be primed as required by manufacturer's instructions to permit ultimate removal of wallcovering from the wall surface. Primer shall be allowed to completely dry before adhesive application.

For VWC-1 applied to existing demountable partitions, follow partition manufacturer's recommendations for surface preparation. See Section 09000 - BUILDING COLOR AND FINISH SCHEDULE for manufacturer reference.

3.3 INSTALLATION

3.3.1 Omitted

3.3.2 Vinyl and Fabric Wallcovering

Wallcovering shall be installed in accordance with the manufacturer's installation instructions. Glue and adhesive spillage shall be immediately removed from wallcovering face and seams with a remover recommended by the manufacturer. After the installation is complete, the fabric wallcovering shall be vacuumed with a ceiling to floor motion.

For VWC-1 applied to existing demountable partitions, follow partition

manufacturer's recommendations for wallcovering installation. See Section 09000 - BUILDING COLOR AND FINISH SCHEDULE for manufacturer reference.

3.3.3 Corner Guards

Corner guards shall be installed where shown on the drawings and in accordance with the manufacturer's printed instructions. Corner guards shall run from top of base to ceiling in a continuous length.

3.4 CLEAN-UP

Upon completion of the work, wallcovering shall be left clean and free of dirt, soiling, stain, or residual film. Surplus materials, rubbish, and debris resulting from the wallcovering installation shall be removed and area shall be left clean.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09775

VERTICAL SURFACING PANEL SYSTEM

PART 1 GENERAL

1.1 REFERENCES
1.1.1 Standards
1.2 RELATED DOCUMENTS
1.3 SUMMARY
1.4 SUBMITTALS
1.5 QUALITY ASSURANCE
1.5.1 Pre-Installation Meetings
1.6 DELIVERY, STORAGE AND HANDLING
1.6.1 Packing, Shipping, Handling and Unloading
1.6.2 Acceptance At Site
1.6.3 Storage and Protection
1.7 PROJECT SITE CONDITIONS
1.8 MAINTENANCE
1.8.1 Extra Materials

PART 2 PRODUCTS

2.1 MANUFACTURER REFERENCE
2.2 SINGLE COMPONENT COMPOSITE CAST PANEL MATERIALS
2.3 EQUIPMENT
2.4 COMPONENTS
2.5 ACCESSORIES

PART 3 EXECUTION

3.1 EXAMINATION
3.2 INSTALLATION
3.3 CLEANING
3.4 PROTECTION

-- End of Section Table of Contents --

SECTION 09775

VERTICAL SURFACING PANEL SYSTEM

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM 3363	(2003) Standard Test method for Film Hardness by Pencil Test
ASTM B 209	(2003) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM C 916	(2003) Standard Specification for Adhesives for Duct Thermal Insulation
ASTM E 84	(2001) Surface Burning Characteristics of Building Materials
ASTM D 4060	(2001) Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI 208.1	(Date) Title

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 90A/90B	(Date) Title

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J 861	(2003) Method of Testing Resistance of Crocking of Organic Trim Materials

1.1.1 Standards

a. Aluminum Trim: ASTM B 209.
b. Medium Density Fiberboard Substrate: ANSI A208.2.
c. Particleboard Substrate: ANSI 208.1
d. Adhesive Composition: ASTM C 916 Type II, NFPA 90A/90B.
e. Adhesive Surface Burning Characteristics: ASTM E 84.
f. UV Hardcoat Pencil Hardness: ASTM 3363.
g. UV Hardcoat Crockmeter Scratch: SAE J 861.
h. UV Hardcoat Taber Abrasion: ASTM D 4060.

1.2 RELATED DOCUMENTS

Conditions of the Contract and portions of Division 1 of this Project Manual apply to this Section as though repeated herein.

1.3 SUMMARY

Section includes

a. Vertical Surfacing Panel Systems
b. Installation Accessories
c. All labor and material for a complete and acceptable installation.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-2 Shop Drawings

Panels; G, AE

Dimensioned layout of all panels.

SD-3 Product Data

Panels; G, RO

Descriptive literature fully describing the cast panel and accessories that include the metal particles, top coat, substrate, installation accessories and maintenance instructions; installation instructions; and adhesive material safety data sheets.

SD-4 Samples

Panels; G, AE

Provide three 5 inch square samples of each panel type with respective substrate, edge detail, pattern and background material and color reflecting anticipated color range of finished product.

SD-11 Closeout Submittals

Maintenance Instructions;

Maintenance instructions relative to panel topcoat and/or extruded trim finish coat.

1.5 QUALITY ASSURANCE

1.5.1 Pre-Installation Meetings

Go through installation procedure with factory trained personnel at the job site. Applicator, Contractor and/or Architect to attend.

1.6 DELIVERY, STORAGE AND HANDLING

1.6.1 Packing, Shipping, Handling and Unloading

a. Protect from excessive moisture.
b. Deliver in unopened packaging clearly marked as to panel, extruded trim and accessory included. For panels, extruded trim indicate type, size, color and pattern.
c. Do not deliver until all wet work is complete and cured.
d. Leave protective cover sheet film in place until final installation.

1.6.2 Acceptance At Site

a. Immediately inspect upon delivery.
b. Verify that packaging is not damaged and that all materials have been received and are correct and undamaged.

1.6.3 Storage and Protection

a. Store products in an area where finished space ambient temperature occurs for at least 48 hours prior to installation.
b. Protect panel edges from damage.
c. Store panel/sheet containers flat.

1.7 PROJECT SITE CONDITIONS

Existing Conditions: Field verify substrate dimensions and readiness for installation. Adjust installation process accordingly.

1.8 MAINTENANCE

1.8.1 Extra Materials

a. Maintenance Stock: Produced from same lot number as remaining product for panels, trim reveals, etc.
b. Panels: 1 full size panel for every 12 full size panels of each different color and pattern.
c. Trim: 1 full length extruded trim piece for every 12 full length pieces of each different color and configuration.
d. Installation Bar and Mounting Brackets: 1 complete set for every 12 complete sets.

PART 2 PRODUCTS

2.1 MANUFACTURER REFERENCE

The following manufacturer information is provided to indicate a standard for product performance. The use of other manufacturers' products of equal performance and appearance is permitted.

The Gage Corporation, 803 South Black River Street, Sparta, Wisconsin

54656; (800)786-4243, gage@centurytel.net.

2.2 SINGLE COMPONENT COMPOSITE CAST PANEL MATERIALS

Manufactured panels to be equal to VS-1 type panels as indicated in Section 09000, BUILDING COLOR AND FINISH SCHEDULE.

2.3 EQUIPMENT

Installation Tools: As required by manufactured printed installation instructions.

2.4 COMPONENTS

"A" Bar Mounting Bars: 0.187 inch extruded aluminum, ASTM B 209, 6063/T5 alloy.

a. Fasteners: Of material, size and spacing as recommended by the manufacturer.

2.5 ACCESSORIES

Adhesive: Any standard solvent-based contact cement.

PART 3 EXECUTION

3.1 EXAMINATION

Site Verification of Conditions

a. Examine substrates with installer present.
b. Verify compliance with requirements for installation tolerances and other conditions affecting final installation.
c. Proceed only after all defects have been corrected.

3.2 INSTALLATION

Acclimatize panels and trim within installation area 48 hours prior to installation.

Install panels at locations indicated with vertical surfaces and edges plumb, horizontal edges level and in alignment with other panels. Scribe panels to fit adjacent work.

a. Z-Bar Application (System "Z"): Refer to manufacturer's printed installation instructions.
(1) Verify stud spacing and coordinate accordingly to ensure engagement of fasteners into studs.
(2) Z-bars to be factory punched at 8 inches on center with 0.173 inch diameter holes.
(3) Factory to provide #8 pan head screws; 1/2 inch lengths for attaching Z-bars to back of panel, 1-1/2 inch lengths for attaching Z-bars to wall surface.

Variation from Plumb: Plus or minus 1/8 inch.

Variation of Joints from Hairline: Less than 1/8 inch.

3.3 CLEANING

Clean panels in accordance with manufacturer's printed instructions. Contractor to replace panels, at no additional cost, that cannot be properly cleaned to the satisfaction of the Architect.

3.4 PROTECTION

Protect installation until final completion of the Project. Contractor to replace damaged components at no additional cost in a manner approved by the Architect.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09809

MULTI-COLOR INTERIOR COATING

PART 1 GENERAL

1.1 RELATED DOCUMENTS
1.2 SCOPE
1.3 RELATED SECTIONS
1.4 SUBMITTALS
1.5 QUALITY ASSURANCE

PART 2 PRODUCTS

2.1 MANUFACTURER
2.2 MATERIALS
2.3 PRODUCT REQUIREMENTS

PART 3 EXECUTION

3.1 PRE-WORK INSPECTION
3.2 JOB CONDITIONS
3.3 SURFACE PREPARATION
3.4 APPLICATION
3.5 CLEANING

-- End of Section Table of Contents --

SECTION 09809

MULTI-COLOR INTERIOR COATING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

The General Requirements of Division One shall apply to all work hereunder.

1.2 SCOPE

Work under this section includes the furnishing and installation of multi-color interior coatings as noted at "PT-7" in Section 09000 - BUILDING COLOR AND FINISH SCHEDULE.

1.3 RELATED SECTIONS

a. Section 09250 - Gypsum Wallboard
b. Section 09900 - Painting

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-3 Product Data

Interior Coating; G, AE

Manufacturer's technical data sheets should be the most current available at time of purchase.

SD-4 Samples

Interior Coating; G, AE

Spray out of each color, at least 8 inches by 10 inches in size.

SD-8 Manufacturer's Instructions

Application; G, RO
Maintenance and Finish Repair; G, RO

Manufacturer's recommendations for application, maintenance and finish repair.

1.5 QUALITY ASSURANCE

a. Test coating prior to proceeding with the final application. Apply to a test area in order to confirm the condition of the substrate and also to assure that:

(1) Texture and color is consistent with the standard, specified in Section 09000, BUILDING COLOR AND FINISH SCHEDULE.
(2) Coverage is in accordance with Painter/Contractors' calculations.

b. Should the finished coat be deemed unsatisfactory, it shall be re-coated until a full and satisfactory finish is achieved.

PART 2 PRODUCTS

2.1 MANUFACTURER

The following manufacturer information is furnished for reference only. Similar products of equal performance and appearance shall be acceptable.

a. Ferroxtone-W products are distributed by Bollen International Inc., Carrollton, Texas. Tel. (972)478-2838; FAX (972)478-2841; Cust. Serv. (800)248-4808.

2.2 MATERIALS

a. Top coat to be a metallic wall coating for interior use. See Section 2.03, "Product Requirements."

b. Materials to be delivered in sealed containers with manufacturer's current technical data sheets, material safety data sheets and labels intact.

c. Store materials in dry, temperature controlled conditions. Prevent from freezing.

2.3 PRODUCT REQUIREMENTS

a. Color as specified in Section 09000, BUILDING COLOR AND FINISH SCHEDULE.
b. Water-based emulsion metallic coating, odorless, suitable for spray application. EPA compliant.
c. Coverage: Sprayed over tinted primer - 1 coat: 130 sq. ft. per gallon; over concrete and brick - 2 coats: 80 - 120 sq. ft. per gallon.
d. Fire Safety: Non-flammable.
e. Drying Time: Sets to the touch in 1 1/2 hours, dries hard in 3 hours. Fully cured in 7 days at 70 degrees F. Re-coat in 1 1/2 hours.
f. Toxicity: Water based - no toxins.
g. Flexibility: No cracking when bent around 1/8 inch mandrel.
h. Mold/Mildew: No visible growth in medium.
i. Odor: No detectable odor. No evacuation required during application.
j. V.O.C.: VOC not to exceed 60 grams per liter or 0.5 lbs. per gallon.
k. Cleaning: Remove marks and scuffs with mild solution of soap and water and a soft brush.
l. Surface texture: Metallic foundry-like texture.

PART 3 EXECUTION

3.1 PRE-WORK INSPECTION

a. Examine surfaces to be coated and report any conditions which would adversely affect the coverage, appearance or performance of the coating system.

b. Proceed with surface preparation and application only after surface is acceptable or authorization has been given by the Specifier Architect and/or Designer.

3.2 JOB CONDITIONS

a. Apply coating only under the following prevailing conditions:
(1) Air and surface temperature not below 45 degrees F.
(2) Do not apply the Ferroxtone-W when humidity is high enough to cause surface condensation or when temperatures fall below 41 degrees F. during drying period.
(3) All dust to be removed from all surfaces to be painted.
(4) All material shall be applied under adequate lighting and weather conditions.

3.3 SURFACE PREPARATION

a. Practices and procedures, normally followed in the painting profession, should be adhered to, with special reference to cleaning and preparing of substrate surfaces prior to the application of coating.
(1) Before applying coating, thoroughly clean all surfaces involved. Schedule all cleaning so that dust and other contaminants from the cleaning process do not fall on wet, newly coated surfaces.
(2) Surfaces shall be free of any foreign materials which would adversely affect adhesion or appearance of the applied coating.

b. Before coating is applied, surfaces shall be tested with a moisture-testing device. No coating shall be applied when moisture content exceeds 12%. Test sufficient area in each space and as often as is necessary to determine the proper moisture content for application.

c. Primers and Sealers: All substrates, with the exception of brick and concrete, must be properly sealed and primed before applying the top coating. Tinted primers are recommended on all other substrates. When substrate is painted, then scarify surface to facilitate adhesion. Metal substrates use a tinted (gray) universal flat metal primer.

d. Metals which are shop coated, unprimed or damaged, should be cleaned to meet the requirements of the Steel Structures Painting Council SP-3 Power-Tool Cleaning and primed in accordance with these specifications.

e. Drywall, Plaster, Concrete and Masonry substrate surfaces should be thoroughly inspected to assure that they are in the proper condition.

f. If wood has knots, sap stains or bleeding dyes, a proper sealer must be used before priming.

g. Walls with paper backed wallpaper should be stripped first.

h. Paint-Contractor shall sand and re-prime all abrasions and damaged spots in the surface of the prime coat before starting application of the top coat.

i. Mildew, if any, shall be removed and neutralized.

3.4 APPLICATION

a. Follow manufacturer's recommendations carefully so as to provide

the best quality work. Contractor shall confirm with manufacturer that the recommendations data specifications in hand are the most current available.

b. Do Not Thin coating.

c. Do not use a brush or airless spray equipment to apply coating.

d. Spraying operation cannot be interrupted.

e. Mixing must be done with a mechanical agitator. Use a pot with an internal mechanical agitator.

f. All materials shall be applied under adequate lighting, free of sags, holidays, lap marks, and pin holes to assure a proper finish top coat.

3.5 CLEANING

a. Remove overspray from glass and adjoining surfaces.

b. Repair any damage to coatings or surfaces caused by cleaning operations.

c. Remove debris from job site and leave storage areas clean.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09900

PAINTS AND COATINGS

02/02

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 OMITTED
1.4 OMITTED
1.5 REGULATORY REQUIREMENTS
1.5.1 Environmental Protection
1.5.2 Lead Content
1.5.3 Chromate Content
1.5.4 Asbestos Content
1.5.5 Mercury Content
1.5.6 Silica
1.5.7 Human Carcinogens
1.6 PACKAGING, LABELING, AND STORAGE
1.7 SAFETY AND HEALTH
1.7.1 Safety Methods Used During Coating Application
1.7.2 Toxic Materials
1.8 ENVIRONMENTAL CONDITIONS
1.8.1 Coatings
1.9 COLOR SELECTION
1.10 LOCATION AND SURFACE TYPE TO BE PAINTED
1.10.1 Painting Included
1.10.1.1 Exterior Painting
1.10.1.2 Interior Painting
1.10.2 Painting Excluded
1.10.3 Omitted
1.10.4 Omitted
1.10.5 Omitted
1.10.6 Definitions and Abbreviations
1.10.6.1 Qualification Testing
1.10.6.2 Batch Quality Conformance Testing
1.10.6.3 Coating
1.10.6.4 DFT or dft
1.10.6.5 DSD
1.10.6.6 EPP
1.10.6.7 EXT
1.10.6.8 INT
1.10.6.9 micron / microns
1.10.6.10 mil / mils
1.10.6.11 mm
1.10.6.12 MPI Gloss Levels
1.10.6.13 MPI System Number
1.10.6.14 Paint
1.10.6.15 REX
1.10.6.16 RIN

PART 2 PRODUCTS

2.1 MATERIALS

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED
3.2 OMITTED
3.3 OMITTED
3.4 OMITTED
3.5 OMITTED
3.6 OMITTED
3.7 PREPARATION OF WOOD AND PLYWOOD SURFACES
3.7.1 Omitted
3.7.2 Omitted
3.7.3 Interior Wood Surfaces, Stain Finish
3.8 APPLICATION
3.8.1 Coating Application
3.8.2 Mixing and Thinning of Paints
3.8.3 Omitted
3.8.4 Coating Systems
3.9 OMITTED
3.10 OMITTED
3.11 OMITTED
3.12 OMITTED
3.13 OMITTED
3.14 PAINT TABLES
3.14.1 Omitted
3.14.2 Interior Paint Tables

-- End of Section Table of Contents --

SECTION 09900

PAINTS AND COATINGS
02/02

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH 0100Doc	(2001) Documentation of the Threshold Limit Values and Biological Exposure Indices

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 523	(1999) Standard Test Method for Specular Gloss

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910.1000	Air Contaminants

MASTER PAINTERS INSTITUTE (MPI)

MPI 44	Interior Latex, Gloss Level 2
MPI 50	(2001) Interior Latex Primer Sealer
MPI 52	(2001) Interior Latex, Gloss Level 3
MPI 54	(2001) Interior Latex, Semi-Gloss
MPI 144	(2001) Institutional Low Odor / VOC Interior Latex, Gloss Level 2
MPI 145	(2001) Institutional Low Odor / VOC Interior Latex, Gloss Level 3
MPI 147	(2001) Institutional Low Odor / VOC Interior Latex, Gloss Level 5

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS SP01-01	(2001) Environmentally Preferable Product Specification for Architectural and Anti-Corrosive Paints

STEEL STRUCTURES PAINTING COUNCIL (SSPC)

SSPC PA 1	(2000) Shop, Field, and Maintenance Painting

SSPC Guide 3 (1995) Safety in Paint Application

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

The current MPI, "Approved Product List" which lists paint by brand, label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

Samples of specified materials may be taken and tested for compliance with specification requirements.

In keeping with the intent of Executive Order 13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition", products certified by SCS as meeting SCS SP01-01 shall be given preferential consideration over registered products. Products that are registered shall be given preferential consideration over products not carrying any EPP designation.

SD-03 Product Data

Coating; G, RO

Manufacturer's Technical Data Sheets

SD-04 Samples

Color; G, RO

Submit manufacturer's samples of paint colors 8 inches by 10 inches in size. Cross reference color samples to color scheme as indicated in Section 09000 - BUILDING COLOR AND FINISH SCHEDULE.

1.3 OMITTED
1.4 OMITTED

1.5 REGULATORY REQUIREMENTS

1.5.1 Environmental Protection

In addition to requirements specified elsewhere for environmental protection, provide coating materials that conform to the restrictions of the local Air Pollution Control District and regional jurisdiction. Notify Contracting Officer of any paint specified herein which fails to conform.

1.5.2 Lead Content

Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.

1.5.3 Chromate Content

Do not use coatings containing zinc-chromate or strontium-chromate.

1.5.4 Asbestos Content

Materials shall not contain asbestos.

1.5.5 Mercury Content

Materials shall not contain mercury or mercury compounds.

1.5.6 Silica

Abrasive blast media shall not contain free crystilline silica.

1.5.7 Human Carcinogens

Materials shall not contain ACGIH 0100Doc and ACGIH 0100Doc confirmed human carcinogens (A1) or suspected human carcinogens (A2).

1.6 PACKAGING, LABELING, AND STORAGE

Paints shall be in sealed containers that legibly show the contract specification number, designation name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name and address of manufacturer. Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinners shall be stored in accordance with the manufacturer's written directions, and as a minimum, stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors, and at temperatures between 40 to 95 degrees F.

1.7 SAFETY AND HEALTH

Apply coating materials using safety methods and equipment in accordance with the following:

Work shall comply with applicable Federal, State, and local laws and regulations, and with the ACCIDENT PREVENTION PLAN, including the Activity Hazard Analysis as specified in Section 01525,"Safety Requirements" and in Appendix A of EM 385-1-1. The Activity Hazard Analysis shall include analyses of the potential impact of painting operations on painting personnel and on others involved in and adjacent to the work zone.

1.7.1 Safety Methods Used During Coating Application

Comply with the requirements of SSPC Guide 3.

1.7.2 Toxic Materials

To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:

a. The applicable manufacturer's Material Safety Data Sheets (MSDS) or local regulation.

b. 29 CFR 1910.1000.

c. ACGIH 0100Doc, threshold limit values.

1.8 ENVIRONMENTAL CONDITIONS

1.8.1 Coatings

Do not apply coating when air or substrate conditions are:

a. Less than 5 degrees F above dew point;

b. Below 50 degrees F or over 95 degrees F, unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

1.9 COLOR SELECTION

Colors of finish coats shall be as indicated on drawings and in Section 09000 BUILDING COLOR AND FINISH SCHEDULE. Where not indicated or specified, colors shall be selected by the Contracting Officer. Manufacturers' names and color identification are used for the purpose of color identification only. Named products are acceptable for use only if they conform to specified requirements. Products of other manufacturers are acceptable if the colors approximate colors indicated and the product conforms to specified requirements.

Tint each coat progressively darker to enable confirmation of the number of coats.

1.10 LOCATION AND SURFACE TYPE TO BE PAINTED

1.10.1 Painting Included

Where a space or surface is indicated to be painted, include the following unless indicated otherwise.

a. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.

b. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.

c. Existing coated surfaces that are damaged during performance of the work.

1.10.1.1 Exterior Painting

Includes new surfaces, existing coated surfaces, and existing uncoated surfaces, of the building and appurtenances as indicated. Also included are existing coated surfaces made bare by cleaning operations.

1.10.1.2 Interior Painting

Includes new surfaces, existing uncoated surfaces, and existing coated surfaces of the building and appurtenances as indicated and existing coated surfaces made bare by cleaning operations. Where a space or surface is indicated to be painted, include the following items, unless indicated otherwise.

a. Exposed columns, girders, beams, joists, and metal deck; and

b. Other contiguous surfaces.

1.10.2 Painting Excluded

Do not paint the following unless indicated otherwise.

a. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.

b. Surfaces in concealed spaces. Concealed spaces are defined as enclosed spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, elevator shafts and chases.

c. Steel to be embedded in concrete.

d. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.

e. Hardware, fittings, and other factory finished items.

1.10.3 Omitted
1.10.4 Omitted
1.10.5 Omitted

1.10.6 Definitions and Abbreviations

1.10.6.1 Qualification Testing

Qualification testing is the performance of all test requirements listed in the product specification. This testing is accomplished by MPI to qualify each product for the MPI Approved Product List, and may also be accomplished by Contractor's third party testing lab if an alternative to Batch Quality Conformance Testing by MPI is desired.

1.10.6.2 Batch Quality Conformance Testing

Batch quality conformance testing determines that the product provided is the same as the product qualified to the appropriate product specification. This testing shall only be accomplished by MPI testing lab.

1.10.6.3 Coating

A film or thin layer applied to a base material called a substrate. A coating may be a metal, alloy, paint, or solid/liquid suspensions on various substrates (metals, plastics, wood, paper, leather, cloth, etc.). They may be applied by electrolysis, vapor deposition, vacuum, or mechanical means such as brushing, spraying, calendering, and roller coating. A coating may be applied for aesthetic or protective purposes or both. The term "coating" as used herein includes emulsions, enamels,

stains, varnishes, sealers, epoxies, and other coatings, whether used as primer, intermediate, or finish coat. The terms paint and coating are used interchangeably.

1.10.6.4 DFT or dft

Dry film thickness, the film thickness of the fully cured, dry paint or coating.

1.10.6.5 DSD

Degree of Surface Degradation, the MPI system of defining degree of surface degradation. Five (5) levels are generically defined under the Assessment sections in the MPI Maintenance Repainting Manual.

1.10.6.6 EPP

Environmentally Preferred Products, a standard for determining environmental preferability in support of Executive Order 13101.

1.10.6.7 EXT

MPI short term designation for an exterior coating system.

1.10.6.8 INT

MPI short term designation for an interior coating system.

1.10.6.9 micron / microns

The metric measurement for 0.001 mm or one/one-thousandth of a millimeter.

1.10.6.10 mil / mils

The English measurement for 0.001 in or one/one-thousandth of an inch, equal to 25.4 microns or 0.0254 mm.

1.10.6.11 mm

The metric measurement for millimeter, 0.001 meter or one/one-thousandth of a meter.

1.10.6.12 MPI Gloss Levels

MPI system of defining gloss. Seven (7) gloss levels (G1 to G7) are generically defined under the Evaluation sections of the MPI Manuals. Traditionally, Flat refers to G1/G2, Eggshell refers to G3, Semigloss refers to G5, and Gloss refers to G6.

Gloss levels are defined by MPI as follows:

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat	0 to 5	10 max
G2	Velvet	0 to 10	10 to 35
G3	Eggshell	10 to 25	10 to 35
G4	Satin	20 to 35	35 min
G5	Semi-Gloss	35 to 70	

G6	Gloss	70 to 85
G7	High Gloss	

Gloss is tested in accordance with ASTM D 523. Historically, the Government has used Flat (G1 / G2), Eggshell (G3), Semi-Gloss (G5), and Gloss (G6).

1.10.6.13 MPI System Number

The MPI coating system number in each Division found in either the MPI Architectural Painting Specification Manual or the Maintenance Repainting Manual and defined as an exterior (EXT/REX) or interior system (INT/RIN). The Division number follows the CSI Master Format.

1.10.6.14 Paint

See Coating definition.

1.10.6.15 REX

MPI short term designation for an exterior coating system used in repainting projects or over existing coating systems.

1.10.6.16 RIN

MPI short term designation for an interior coating system used in repainting projects or over existing coating systems.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to the coating specifications and standards referenced in PART 3. Submit manufacturer's technical data sheets for specified coatings and solvents. See Section 09000 - BUILDING COLOR AND FINISH SCHEDULE specifications for manufacturer and product reference information.

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED

Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

3.2 OMITTED
3.3 OMITTED
3.4 OMITTED
3.5 OMITTED
3.6 OMITTED

3.7 PREPARATION OF WOOD AND PLYWOOD SURFACES

3.7.1 Omitted
3.7.2 Omitted

3.7.3 Interior Wood Surfaces, Stain Finish

Interior wood surfaces to receive stain shall be sanded. Oak and other open-grain wood to receive stain shall be given a coat of wood filler not less than 8 hours before the application of stain; excess filler shall be removed and the surface sanded smooth.

3.8 APPLICATION

3.8.1 Coating Application

Painting practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates, except as modified herein.

At the time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application.

Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated.

Paints, except water-thinned types, shall be applied only to surfaces that are completely free of moisture as determined by sight or touch.

Thoroughly work coating materials into joints, crevices, and open spaces. Special attention shall be given to insure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces.

Each coat of paint shall be applied so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete.

Touch up damaged coatings before applying subsequent coats. Interior areas shall be broom clean and dust free before and during the application of coating material.

a. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.

b. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than

recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.

c. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

3.8.2 Mixing and Thinning of Paints

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory to suit surface, temperature, weather conditions, application methods, or for the type of paint being used. Obtain written permission from the Contracting Officer to use thinners. The written permission shall include quantities and types of thinners to use.

When thinning is allowed, paints shall be thinned immediately prior to application with not more than 1 pint of suitable thinner per gallon. The use of thinner shall not relieve the Contractor from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed limits on volatile organic compounds. Paints of different manufacturers shall not be mixed.

3.8.3 Omitted

3.8.4 Coating Systems

a. Systems by Substrates: Apply coatings that conform to the respective specifications listed in the following Tables:

Table

Division 9: Interior Plaster, Gypsum Board, Textured Surfaces Paint Table

b. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.

c. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.

d. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:

(1) One coat of primer.

(2) One coat of undercoat or intermediate coat.

(3) One topcoat to match adjacent surfaces.

e. Existing Coated Surfaces To Be Painted: Apply coatings conforming

to the respective specifications listed in the Tables herein, except that pretreatments, sealers and fillers need not be provided on surfaces where existing coatings are soundly adhered and in good condition. Do not omit undercoats or primers.

3.9 OMITTED
3.10 OMITTED
3.11 OMITTED
3.12 OMITTED
3.13 OMITTED

3.14 PAINT TABLES

3.14.1 Omitted

3.14.2 Interior Paint Tables

DIVISION 9: INTERIOR PLASTER, GYPSUM BOARD, TEXTURED SURFACES PAINT TABLE

A. New and Existing, previously painted Wallboard not otherwise specified:

1. Latex
New; MPI INT 9.2A-G2 (Flat) / Existing; RIN 9.2A-G2 (Flat)
Primer: Intermediate: Topcoat:
MPI 50 MPI 44 MPI 44
System DFT: 4 mils

New; MPI INT 9.2A-G3 (Eggshell) / Existing; RIN 9.2A-G3 (Eggshell)
Primer: Intermediate: Topcoat:
MPI 50 MPI 52 MPI 52
System DFT: 4 mils

New; MPI INT 9.2A-G5 (Semigloss) / Existing; RIN 9.2A-G5 (Semigloss)
Primer: Intermediate: Topcoat:
MPI 50 MPI 54 MPI 54
System DFT: 4 mils

2. Institutional Low Odor / Low VOC Latex
New; MPI INT 9.2M-G2 (Flat) / Existing; MPI RIN 9.2M-G2 (Flat)
Primer: Intermediate: Topcoat:
MPI 50 MPI 144 MPI 144
System DFT: 4 mils

New; MPI INT 9.2M-G3 (Eggshell) / Existing; MPI RIN 9.2M-G3 (Eggshell)
Primer: Intermediate: Topcoat:
MPI 50 MPI 145 MPI 145
System DFT: 4 mils

New; MPI INT 9.2M-G5 (Semigloss) / Existing; MPI RIN 9.2M-G5 (Semigloss)
Primer: Intermediate: Topcoat:
MPI 50 MPI 147 MPI 147
System DFT: 4 mils

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 10 - SPECIALTIES

SECTION 10260

WALL AND CORNER GUARDS

07/02

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY AND STORAGE
1.4 WARRANTY

PART 2 PRODUCTS

2.1 GENERAL
2.2 CORNER GUARDS
2.2.1 Omitted
2.2.2 Stainless Steel Corner Guards
2.3 WALL GUARDS (CRASH RAILS)
2.3.1 Stainless Steel Wall Guards
2.4 OMITTED
2.5 OMITTED
2.6 TRIM, FASTENERS AND ANCHORS
2.7 FINISH
2.7.1 Omitted
2.7.2 Stainless Steel Finish

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Corner Guards and Wall Guards (Bumper Guards)
3.1.2 Omitted
3.1.3 Stainless Steel Guards

-- End of Section Table of Contents --

SECTION 10260

WALL AND CORNER GUARDS
07/02

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 167	(1999) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Corner Guards; G, RO
Wall Guards (Bumper Guards); G, RO

Drawings indicating locations and typical elevations of each type of item. Drawings shall show vertical and horizontal dimensions, full size sections, thickness of materials, and fastening details.

SD-03 Product Data

Corner Guards; G, RO
Wall Guards (Bumper Guards); G, RO

Manufacturer's descriptive data, catalog cuts, installation instructions, and recommended cleaning instructions.

SD-04 Samples

Finish; G, RO

Manufacturer's standard samples indicating color and texture of materials requiring color and finish selection.

SD-06 Test Reports

Corner Guards
Wall Guards (Bumper Guards)

Fire rating and extinguishing test results for resilient material.

SD-07 Certificates

Corner Guards
Wall Guards (Bumper Guards)

Statements attesting that the items comply with specified fire and safety code requirements.

1.3 DELIVERY AND STORAGE

Materials shall be delivered to the project site in manufacturer's original unopened containers with seals unbroken and labels and trademarks intact. Materials shall be kept dry, protected from weather and damage, and stored under cover. Materials shall be stored at approximately 70 degrees F for at least 48 hours prior to installation.

1.4 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period shall be provided.

PART 2 PRODUCTS

2.1 GENERAL

To the maximum extent possible, corner guards, door and door frame protectors, wall guards (bumper guards), wall panels and wall covering shall be the standard products of a single manufacturer and shall be furnished as detailed. Drawings show general configuration of products required, and items differing in minor details from those shown will be acceptable.

2.2 CORNER GUARDS

2.2.1 Omitted

2.2.2 Stainless Steel Corner Guards

Stainless steel corner guards shall be fabricated of 16 gauge material conforming to ASTM A 167, type 302 or 304. Corner guards shall extend from floor to ceiling. Corner guard shall be formed to 3.5 inch legs.

2.3 WALL GUARDS (CRASH RAILS)

2.3.1 Stainless Steel Wall Guards

Wall guards shall be provided with prefabricated end closure caps, inside and outside corners, concealed splices, cushions, mounting hardware and other accessories standard with the manufacturer. End caps and corners shall be field adjustable to assure close alignment with handrails and wall guards. Wall guards shall have 5.5 inch high profile with V groove.

2.4 OMITTED
2.5 OMITTED

2.6 TRIM, FASTENERS AND ANCHORS

Trim, fasteners and anchors shall be provided for each specific installation as shown.

2.7 FINISH

2.7.1 Omitted

2.7.2 Stainless Steel Finish

Finish for stainless steel shall be in accordance with NAAM finish number 4 (satin finish).

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Corner Guards and Wall Guards (Bumper Guards)

Material shall be mounted at location indicated in accordance with manufacturer's recommendations.

3.1.2 Omitted

3.1.3 Stainless Steel Guards

a. Mount guards on external corners of interior walls, partitions and columns as per manufacturer's recommendations.

b. For wall guards, space brackets at no more than 3 feet on centers and anchor to the wall in accordance with the manufacturer's installation instructions.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16415A

ELECTRICAL WORK, INTERIOR

06/02

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL
1.2.1 Rules
1.2.2 Coordination
1.2.3 Special Environments
1.2.3.1 Weatherproof Locations
1.2.4 Standard Products
1.2.5 Nameplates
1.2.5.1 Identification Nameplates
1.2.6 As-Built Drawings
1.3 SUBMITTALS
1.4 WORKMANSHIP
1.5 SEISMIC REQUIREMENTS

PART 2 PRODUCTS

2.1 OMITTED
2.2 CABLES AND WIRES
2.2.1 Equipment Manufacturer Requirements
2.2.2 Aluminum Conductors
2.2.3 Insulation
2.2.4 Bonding Conductors
2.2.5 Omitted
2.2.6 Omitted
2.2.7 Metal-Clad Cable
2.2.8 Armored Cable
2.3 OMITTED
2.4 OMITTED
2.5 OMITTED
2.6 CIRCUIT BREAKERS
2.6.1 MOLDED-CASE CIRCUIT BREAKERS
2.6.1.1 Construction
2.6.1.2 Ratings
2.6.2 Solid-State Trip Elements
2.6.3 Omitted
2.6.4 SWD Circuit Breakers
2.6.5 Omitted
2.6.6 Omitted
2.6.7 Omitted
2.6.8 Ground Fault Circuit Interrupters
2.7 OMITTED
2.8 CONDUIT AND TUBING
2.8.1 Electrical, Zinc-Coated Steel Metallic Tubing (EMT)
2.8.2 Omitted

2.8.3 Omitted
2.8.4 Flexible Conduit, Steel and Plastic
2.8.5 Omitted
2.8.6 Omitted
2.8.7 Omitted
2.8.8 Rigid Metal Conduit
2.8.9 Rigid Plastic Conduit
2.8.10 Surface Metal Electrical Raceways and Fittings
2.9 CONDUIT AND DEVICE BOXES AND FITTINGS
2.9.1 Boxes, Metallic Outlet
2.9.2 Omitted
2.9.3 Omitted
2.9.4 Boxes, Switch (Enclosed), Surface-Mounted
2.9.5 Fittings for Conduit and Outlet Boxes
2.9.6 Omitted
2.9.7 Fittings, PVC, for Use with Rigid PVC Conduit and Tubing
2.10 CONDUIT COATINGS PLASTIC RESIN SYSTEM
2.11 CONNECTORS, WIRE PRESSURE
2.11.1 For Use With Copper Conductors
2.12 ELECTRICAL GROUNDING AND BONDING EQUIPMENT
2.12.1 Ground Rods
2.12.2 Ground Bus
2.13 ENCLOSURES
2.13.1 Cabinets and Boxes
2.13.2 Circuit Breaker Enclosures
2.14 LIGHTING FIXTURES, LAMPS, BALLASTS, EMERGENCY EQUIPMENT, CONTROLS AND ACCESSORIES
2.14.1 Lamps
2.14.2 Ballasts and Transformers
2.14.3 Fixtures
2.14.4 Lampholders, Starters, and Starter Holders
2.14.5 Ultrasonic, and Passive Infrared Occupancy Sensors
2.15 LOW-VOLTAGE FUSES AND FUSEHOLDERS
2.15.1 Fuses, Low Voltage Cartridge Type
2.15.2 Fuses, High-Interrupting-Capacity, Current-Limiting Type
2.15.3 Fuses, Class K, High-Interrupting-Capacity Type
2.15.4 Fuses, Class H
2.15.5 Fuses, Class R
2.15.6 Fuses, Class T
2.15.7 Fuses for Supplementary Overcurrent Protection
2.15.8 Fuses, D-C for Industrial Use
2.15.9 Fuseholders
2.16 OMITTED
2.17 OMITTED
2.18 OMITTED
2.19 PANELBOARDS
2.20 RECEPTACLES
2.20.1 Omitted
2.20.2 Heavy Duty Grade
2.20.3 Standard Grade
2.20.4 Ground Fault Interrupters
2.20.5 Omitted
2.20.6 NEMA Standard Receptacle Configurations
2.21 OMITTED
2.22 SPLICE, CONDUCTOR
2.23 OMITTED
2.24 SNAP SWITCHES
2.25 TAPES
2.25.1 Plastic Tape

2.25.2 Rubber Tape
2.26 OMITTED
2.27 OMITTED
2.28 OMITTED
2.29 OMITTED
2.30 OMITTED
2.31 WIRING DEVICES

PART 3 EXECUTION

3.1 GROUNDING
3.1.1 Ground Rods
3.1.2 Ground Bus
3.1.3 Grounding Conductors
3.2 WIRING METHODS
3.2.1 Conduit and Tubing Systems
3.2.1.1 Pull Wires
3.2.1.2 Omitted
3.2.1.3 Omitted
3.2.1.4 Omitted
3.2.1.5 Changes in Direction of Runs
3.2.1.6 Supports
3.2.1.7 Exposed Raceways
3.2.2 Omitted
3.2.3 Omitted
3.2.4 Cables and Conductors
3.2.4.1 Sizing
3.2.4.2 Use of Aluminum Conductors in Lieu of Copper
3.2.4.3 Cable Systems
3.2.4.4 Omitted
3.2.4.5 Cable Splicing
3.2.4.6 Conductor Identification and Tagging
3.3 BOXES AND SUPPORTS
3.3.1 Box Applications
3.3.2 Brackets and Fasteners
3.3.3 Mounting in Walls, Ceilings, or Recessed Locations
3.3.4 Installation in Overhead Spaces
3.4 DEVICE PLATES
3.5 RECEPTACLES
3.5.1 Single and Duplex, 15 or 20-ampere, 125 volt
3.5.2 Omitted
3.5.3 Omitted
3.5.4 Weatherproof Applications
3.5.4.1 Damp Locations
3.5.5 Receptacles, 15-Ampere, 250-Volt
3.5.6 Receptacles, 20-Ampere, 250-Volt
3.5.7 Receptacles, 30-Ampere, 125/250-Volt
3.5.8 Receptacles, 30-Ampere, 250-Volt
3.6 WALL SWITCHES
3.7 OMITTED
3.8 PANELBOARDS AND LOADCENTERS
3.8.1 Loadcenters
3.8.2 Panelboards
3.9 FUSES
3.9.1 Cartridge Fuses; Noncurrent-Limiting Type
3.9.2 Cartridge Fuses; Current-Limiting Type
3.9.3 Continuous Current Ratings (600 Amperes and Smaller)
3.9.4 Omitted
3.9.5 Motor and Transformer Circuit Fuses

3.10 OMITTED
3.11 OMITTED
3.12 OMITTED
3.13 OMITTED
3.14 MOTOR-DISCONNECT MEANS
3.15 OMITTED
3.16 LIGHTING FIXTURES, LAMPS AND BALLASTS
3.16.1 Lamps
3.16.2 Lighting Fixtures
3.16.2.1 Accessories
3.16.2.2 Ceiling Fixtures
3.16.2.3 Fixtures for Installation in Grid Type Ceilings
3.16.2.4 Suspended Fixtures
3.16.3 Ballasts
3.16.4 Emergency Light Sets
3.17 BATTERY CHARGERS
3.18 EQUIPMENT CONNECTIONS
3.18.1 Omitted
3.18.2 Installation of Government-Furnished Equipment
3.18.3 Food Service Equipment Provided Under Other Sections
3.19 CIRCUIT PROTECTIVE DEVICES
3.20 PAINTING AND FINISHING
3.21 REPAIR OF EXISTING WORK
3.22 FIELD TESTING
3.22.1 Safety
3.22.2 Ground-Resistance Tests
3.22.3 Omitted
3.22.4 Cable Tests
3.22.4.1 Omitted
3.22.4.2 Low Voltage Cable Tests
3.22.5 Omitted
3.22.6 Omitted
3.22.7 Omitted
3.22.8 Omitted
3.22.9 Circuit Breaker Tests
3.22.9.1 Omitted
3.22.9.2 Circuit Breakers, Low Voltage
3.22.9.3 Circuit Breakers, Molded Case
3.22.10 Omitted
3.22.11 Protective Relays
3.23 OPERATING TESTS
3.24 FIELD SERVICE
3.24.1 Onsite Training
3.24.2 Installation Engineer
3.25 ACCEPTANCE

-- End of Section Table of Contents --

SECTION 16415A

ELECTRICAL WORK, INTERIOR
06/02

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C78.1	(1991; C78.1a; R 1996) Fluorescent Lamps - Rapid-Start Types - Dimensional and Electrical Characteristics
ANSI C78.1350	(1990) Electric Lamps - 400-Watt, 100-Volt, S51 Single-Ended High-Pressure Sodium Lamps
ANSI C78.1351	(1989) Electric Lamps - 250-Watt, 100-Volt S50 Single-Ended High-Pressure Sodium Lamps
ANSI C78.1352	(1990) Electric Lamps - 1000-Watt, 250-Volt, S52 Single-Ended High-Pressure Sodium Lamps
ANSI C78.1355	(1989) Electric Lamps - 150-Watt, 55-Volt S55 High-Pressure Sodium Lamps
ANSI C78.1375	(1996) 400-Watt, M59 Single-Ended Metal-Halide Lamps
ANSI C78.1376	(1996) 1000-Watt, M47 Metal-Halide Lamps
ANSI C78.20	(1995) Electric Lamps - Characteristics of Incandescent Lamps A, G, PS, and Similar Shapes with E26 Medium Screw Bases
ANSI C78.21	(1995) Physical and Electrical Characteristics - Incandescent Lamps - PAR and R Shapes
ANSI C78.2A	(1991) 18 & 26- Watt, Compact Fluorescent Quad Tube Lamps **
ANSI C78.2B	(1992) 9 & 13-Watt, Compact Fluorescent Quad Tube Lamps **
ANSI C82.1	(1997) Specifications for Fluorescent Lamp Ballasts \$18.00$\F\X Addenda D & E
ANSI C82.4	(1992) Ballasts for

	High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 1	(1995) Hard-Drawn Copper Wire
ASTM B 8	(1999) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM D 709	(2000) Laminated Thermosetting Materials

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C57.13	(1993) Instrument Transformers
IEEE C62.41	(1991; R 1995) Surge Voltages in Low-Voltage AC Power Circuits
IEEE Std 81	(1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System (Part 1) \$31.00$\F

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(1997) Enclosures for Electrical Equipment (1000 Volts Maximum)
NEMA AB 1	(1993) Molded Case Circuit Breakers and Molded Case Switches
NEMA FU 1	(1986) Low Voltage Cartridge Fuses
NEMA ICS 6	(1993) Industrial Control and Systems, Enclosures
NEMA LE 4	(1987) Recessed Luminaires, Ceiling Compatibility
NEMA OS 1	(1996) Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports
NEMA PB 1	(1995) Panelboards
NEMA RN 1	(1998) Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
NEMA TC 2	(1998) Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA WD 1	(1999) General Requirements for Wiring Devices
NEMA WD 6	(1997) Wiring Devices - Dimensional Requirements

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101	(2000) Life Safety Code
NFPA 70	(2002) National Electrical Code

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

47 CFR 18	Industrial, Scientific, and Medical Equipment

UNDERWRITERS LABORATORIES (UL)

UL 1	(2000) Flexible Metal Conduit
UL 1029	(1994; Rev thru Dec 1997) High-Intensity-Discharge Lamp Ballasts
UL 1569	(1999; Rev thru Jan 2000) Metal-Clad Cables
UL 1570	(1995; Rev thru Nov 1999) Fluorescent Lighting Fixtures
UL 1571	(1995; Rev thru Nov 1999) Incandescent Lighting Fixtures
UL 1572	(1995; Rev thru Nov 1999) High Intensity Discharge Lighting Fixtures
UL 1660	(2000) Liquid-Tight Flexible Nonmetallic Conduit
UL 198B	(1995) Class H Fuses
UL 198C	(1986; Rev thru Feb 1998) High-Interrupting-Capacity Fuses, Current-Limiting Types
UL 198D	(1995) Class K Fuses
UL 198E	(1988; Rev Jul 1988) Class R Fuses
UL 198G	(1988; Rev May 1988) Fuses for Supplementary Overcurrent Protection
UL 198H	(1988; Rev thru Nov 1993) Class T Fuses
UL 198L	(1995; Rev May 1995) D-C Fuses for Industrial Use
UL 20	(1995; Rev thru Oct 1998) General-Use Snap Switches
UL 360	(1996; Rev thru Oct 1997) Liquid-Tight Flexible Steel Conduit
UL 4	(1996) Armored Cable
UL 467	(1993; Rev thru Apr 1999) Grounding and

	Bonding Equipment
UL 486A	(1997; Rev thru Dec 1998) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 486C	(1997; Rev thru Aug 1998) Splicing Wire Connectors
UL 486E	(1994; Rev thru Feb 1997) Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
UL 489	(1996; Rev thru Dec 1998) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures
UL 498	(1996; Rev thru Jan 1999) Attachment Plugs and Receptacles
UL 5	(1996) Surface Metal Raceways and Fittings
UL 50	(1995; Rev thru Nov 1999) Enclosures for Electrical Equipment
UL 510	(1994; Rev thru Apr 1998) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
UL 512	(1993; Rev thru Mar 1999) Fuseholders
UL 514A	(1996; Rev Dec 1999) Metallic Outlet Boxes
UL 514B	(1997; Rev Oct 1998) Fittings for Cable and Conduit
UL 542	(1999) Lampholders, Starters, and Starter Holders for Fluorescent Lamps
UL 6	(1997) Rigid Metal Conduit
UL 651	(1995; Rev thru Oct 1998) Schedule 40 and 80 Rigid PVC Conduit
UL 651A	(1995; Rev thru Apr 1998) Type EB and A Rigid PVC Conduit and HDPE Conduit
UL 67	(1993; Rev thru Oct 1999) Panelboards
UL 797	(1993; Rev thru Mar 1997) Electrical Metallic Tubing
UL 83	(1998; Rev thru Sep 1999) Thermoplastic-Insulated Wires and Cables
UL 844	(1995; Rev thru Mar 1999) Electric Lighting Fixtures for Use in Hazardous (Classified) Locations

UL 877	(1993; Rev thru Nov 1999) Circuit Breakers and Circuit-Breaker Enclosures for Use in Hazardous (Classified) Locations
UL 916	(1998) Energy Management Equipment
UL 924	(1995; Rev thru Oct 97) Emergency Lighting and Power Equipment
UL 943	(1993; Rev thru May 1998) Ground-Fault Circuit-Interrupters
UL 98	(1994; Rev thru Jun 1998) Enclosed and Dead-Front Switches
UL Elec Const Dir	(1999) Electrical Construction Equipment Directory

1.2 GENERAL

1.2.1 Rules

The installation shall conform to the requirements of NFPA 70 and NFPA 101, unless more stringent requirements are indicated or shown.

1.2.2 Coordination

The drawings indicate the extent and the general location and arrangement of equipment, conduit, and wiring. The Contractor shall become familiar with all details of the work and verify all dimensions in the field so that the outlets and equipment shall be properly located and readily accessible. Lighting fixtures, outlets, and other equipment and materials shall be carefully coordinated with mechanical or structural features prior to installation and positioned according to architectural reflected ceiling plans; otherwise, lighting fixtures shall be symmetrically located according to the room arrangement when uniform illumination is required, or asymmetrically located to suit conditions fixed by design and shown. Raceways, junction and outlet boxes, and lighting fixtures shall not be supported from sheet metal roof decks. If any conflicts occur necessitating departures from the drawings, details of and reasons for departures shall be submitted and approved prior to implementing any change. The Contractor shall coordinate the electrical requirements of the mechanical work and provide all power related circuits, wiring, hardware and structural support, even if not shown on the drawings.

1.2.3 Special Environments

1.2.3.1 Weatherproof Locations

Wiring, Fixtures, and equipment in designated locations shall conform to NFPA 70 requirements for installation in damp or wet locations.

1.2.4 Standard Products

Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening.

1.2.5 Nameplates

1.2.5.1 Identification Nameplates

Major items of electrical equipment and major components shall be permanently marked with an identification name to identify the equipment by type or function and specific unit number as indicated. Unless otherwise specified, identification nameplates shall be made of laminated plastic in accordance with ASTM D 709 with black outer layers and a white core. Edges shall be chamfered. Plates shall be fastened with black-finished round-head drive screws, except motors, or approved nonadhesive metal fasteners. When the nameplate is to be installed on an irregular-shaped object, the Contractor shall devise an approved support suitable for the application and ensure the proper installation of the supports and nameplates. In all instances, the nameplate shall be installed in a conspicuous location. At the option of the Contractor, the equipment manufacturer's standard embossed nameplate material with black paint-filled letters may be furnished in lieu of laminated plastic. The front of each panelboard shall have a nameplate to indicate the phase letter, corresponding color and arrangement of the phase conductors. The following equipment, as a minimum, shall be provided with identification nameplates:

Minimum 1/4 inch High Letters	Minimum 1/8 inch High Letters
Panelboards	
Equipment Enclosures	Control Devices

Each panel and section assembly shall be provided with a nameplate in addition to nameplates listed above, which shall be provided for individual compartments in the respective assembly, including nameplates which identify "future," "spare," and "dedicated" or "equipped spaces."

1.2.6 As-Built Drawings

Following the project completion or turnover, within 30 days the Contractor shall furnish 2 sets of as-built drawings to the Contracting Officer.

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

Interior Electrical Equipment; G, RO.

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams, and other information necessary to define the installation. Detail drawings shall show the rating of items and systems and how the components of an item and system are assembled, function together, and how they will be installed on the project. Data and drawings for component parts of an item or system shall be coordinated and submitted as a unit. Data and drawings shall be coordinated and included in a single submission. Multiple submissions for the same equipment or system are not

acceptable except where prior approval has been obtained from the Contracting Officer. In such cases, a list of data to be submitted later shall be included with the first submission. Detail drawings shall show physical arrangement, construction details, connections, finishes, materials used in fabrication, provisions for conduit or busway entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. Optional items shall be clearly identified as included or excluded. Detail drawings shall as a minimum include:

a. Sway bracing for suspended luminaires.

b. Suspension mechanisms and winches.

Structural drawings showing the structural or physical features of major equipment items, components, assemblies, and structures, including foundations or other types of supports for equipment and conductors. These drawings shall include accurately scaled or dimensioned outline and arrangement or layout drawings to show the physical size of equipment and components and the relative arrangement and physical connection of related components. Weights of equipment, components and assemblies shall be provided when required to verify the adequacy of design and proposed construction of foundations or other types of supports. Dynamic forces shall be stated for switching devices when such forces must be considered in the design of support structures. The appropriate detail drawings shall show the provisions for leveling, anchoring, and connecting all items during installation, and shall include any recommendations made by the manufacturer.

Electrical drawings including single-line and three-line diagrams, and schematics or elementary diagrams of each electrical system; internal wiring and field connection diagrams of each electrical device when published by the manufacturer; wiring diagrams of cabinets, panels, units, or separate mountings; interconnection diagrams that show the wiring between separate components of assemblies; field connection diagrams that show the termination of wiring routed between separate items of equipment; internal wiring diagrams of equipment showing wiring as actually provided for this project. Field wiring connections shall be clearly identified.

If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures, including changes in related portions of the project and the reasons why, shall be submitted with the detail drawings. Approved departures shall be made at no additional cost to the Government.

SD-03 Product Data

Manufacturer's Catalog; G, RO.

Data composed of catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

Material, Equipment, and Fixture Lists;

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each entry shall include an item number, the quantity of items proposed, and the name of the manufacturer of each item.

Installation Procedures; G, RO.

Installation procedures for overhead winches and lowering/ suspension mechanisms. Procedures shall include diagrams, instructions, and precautions required to install, adjust, calibrate, and test devices and equipment.

As-Built Drawings; G, RO.

The as-built drawings shall be a record of the construction as installed. The drawings shall include all the information shown on the contract drawings, deviations, modifications, and changes from the contract drawings, however minor. The as-built drawings shall be kept at the job site and updated daily. The as-built drawings shall be a full-sized set of prints marked to reflect all deviations, changes, and modifications. The as-built drawings shall be complete and show the location, size, dimensions, part identification, and other information. Additional sheets may be added. The as-built drawings shall be jointly inspected for accuracy and completeness by the Contractor's quality control representative and by the Contracting Officer prior to the submission of each monthly pay estimate. Upon completion of the work, the Contractor shall submit three full sized sets of the marked prints to the Contracting Officer for approval. If upon review, the as-built drawings are found to contain errors and/or omissions, they will be returned to the Contractor for correction. The Contractor shall correct and return the as-built drawings to the Contracting Officer for approval within ten calendar days from the time the drawings are returned to the Contractor.

Onsite Tests; G, RO.

A detailed description of the Contractor's proposed procedures for on-site tests.

SD-06 Test Reports

Factory Test Reports; G, RO.

Six copies of the information described below in 8 1/2 x 11 inch binders having a minimum of 5 rings from which material may readily be removed and replaced, including a separate section for each test. Sections shall be separated by heavy plastic dividers with tabs.

a. A list of equipment used, with calibration certifications.

b. A copy of measurements taken.

c. The dates of testing.

d. The equipment and values to be verified.

e. The conditions specified for the test.

f. The test results, signed and dated.

g. A description of adjustments made.

Field Test Plan; G, RO.

A detailed description of the Contractor's proposed procedures for onsite test submitted 30 days prior to testing the installed system. No field test will be performed until the test plan is approved. The test plan shall consist of complete field test procedures including tests to be performed, test equipment required, and tolerance limits.

Field Test Reports; G, RO.

Six copies of the information described below in 8 1/2 x 11 inch binders having a minimum of 5 rings from which material may readily be removed and replaced, including a separate section for each test. Sections shall be separated by heavy plastic dividers with tabs.

a. A list of equipment used, with calibration certifications.

b. A copy of measurements taken.

c. The dates of testing.

d. The equipment and values to be verified.

e. The conditions specified for the test.

f. The test results, signed and dated.

g. A description of adjustments made.

h. Final position of controls and device settings.

SD-07 Certificates

Materials and Equipment;

The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted. However, materials and equipment installed in hazardous locations must bear the UL label unless the data submitted from other testing agency is specifically approved in writing by the Contracting Officer. Items which are required to be listed and labeled in accordance with Underwriters Laboratories must be affixed with a UL label that states that it is UL listed. No exceptions or waivers will be granted to this requirement. Materials and equipment will be approved based on the

manufacturer's published data.

For other than equipment and materials specified to conform to UL publications, a manufacturer's statement indicating complete compliance with the applicable standard of the American Society for Testing and Materials, National Electrical Manufacturers Association, or other commercial standard, is acceptable.

1.4 WORKMANSHIP

Materials and equipment shall be installed in accordance with NFPA 70, recommendations of the manufacturer, and as shown.

1.5 SEISMIC REQUIREMENTS

Seismic details shall be as indicated.

PART 2 PRODUCTS

Products shall conform to the respective publications and other requirements specified below. Materials and equipment not listed below shall be as specified elsewhere in this section. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

2.1 OMITTED

2.2 CABLES AND WIRES

Conductors No. 8 AWG and larger diameter shall be stranded. Conductors No. 10 AWG and smaller diameter shall be solid, except that conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise. Conductor sizes and ampacities shown are based on copper, unless indicated otherwise. All conductors shall be copper.

2.2.1 Equipment Manufacturer Requirements

When manufacturer's equipment requires copper conductors at the terminations or requires copper conductors to be provided between components of equipment, provide copper conductors or splices, splice boxes, and other work required to meet manufacturer's requirements.

2.2.2 Aluminum Conductors

Aluminum conductors shall not be used.

2.2.3 Insulation

Unless indicated otherwise, or required by NFPA 70, power and lighting wires shall be 600-volt, Type THWN, THHN, or THW conforming to UL 83, except that grounding wire may be type TW conforming to UL 83; remote-control and signal circuits shall be Type TW, THW or TF, conforming to UL 83. Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

2.2.4 Bonding Conductors

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

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

2.2.5 Omitted
2.2.6 Omitted

2.2.7 Metal-Clad Cable

UL 1569; NFPA 70, Type MC cable.

2.2.8 Armored Cable

UL 4; NFPA 70, Type AC cable.

2.3 OMITTED
2.4 OMITTED
2.5 OMITTED

2.6 CIRCUIT BREAKERS

2.6.1 MOLDED-CASE CIRCUIT BREAKERS

Molded-case circuit breakers shall conform to NEMA AB 1 and UL 489and UL 877 for circuit breakers. Circuit breakers may be installed in panelboards, enclosures, or combination motor controllers.

2.6.1.1 Construction

Circuit breakers shall be suitable for mounting and operating in any position. Lug shall be listed for copper conductors only in accordance with UL 486E. Single-pole circuit breakers shall be full module size with not more than one pole per module. Multi-pole circuit breakers shall be of the common-trip type having a single operating handle such that an overload or short circuit on any one pole will result in all poles opening simultaneously. Sizes of 100 amperes or less may consist of single-pole breakers permanently factory assembled into a multi-pole unit having an internal, mechanical, nontamperable common-trip mechanism and external handle ties. All circuit breakers shall have a quick-make, quick-break overcenter toggle-type mechanism, and the handle mechanism shall be trip-free to prevent holding the contacts closed against a short-circuit or sustained overload. All circuit breaker handles shall assume a position between "ON" and "OFF" when tripped automatically. All ratings shall be clearly visible.

2.6.1.2 Ratings

Voltage ratings shall be not less than the applicable circuit voltage. The interrupting rating of the circuit breakers shall be at least equal to the available short-circuit current at the line terminals of the circuit breaker and correspond to the UL listed integrated short-circuit current rating specified for the panelboards and switchboards. Molded-case circuit breakers shall have nominal voltage ratings, maximum continuous-current ratings, and maximum short-circuit interrupting ratings in accordance with NEMA AB 1. Ratings shall be coordinated with system X/R ratio.

2.6.2 Solid-State Trip Elements

Solid-state circuit breakers shall be provided as shown. All electronics shall be self-contained and require no external relaying, power supply, or

accessories. Printed circuit cards shall be treated to resist moisture absorption, fungus growth, and signal leakage. All electronics shall be housed in an enclosure which provides protection against arcs, magnetic interference, dust, and other contaminants. Solid-state sensing shall measure true RMS current with error less than one percent on systems with distortions through the 13th harmonic. Peak or average actuating devices are not acceptable. Current sensors shall be torodial construction, encased in a plastic housing filled with epoxy to protect against damage and moisture and shall be integrally mounted on the breaker. Where indicated on the drawings, circuit breaker frames shall be rated for 100 percent continuous duty. Circuit breakers shall have tripping features as shown on the drawings and as described below:

a. Long-time current pick-up, adjustable from 50 percent to 100 percent of continuous current rating.

b. Adjustable long-time delay.

c. Short-time current pick-up, adjustable from 1.5 to 9 times long-time current setting.

d. Adjustable short-time delay.

e. Instantaneous current pick-up, adjustable from 1.5 to 9 times long-time current setting.

f. Ground-fault pick-up, adjustable from 20 percent to 60 percent of sensor rating, but not greater than 1200 amperes. Sensing of ground-fault current at the main bonding jumper or ground strap will not be permitted. Zone-selective interlocking shall be provided as shown.

g. Ground-fault I square times t switch.

h. Overload, short-time and ground-fault trip indicators shall be provided.

2.6.3 Omitted

2.6.4 SWD Circuit Breakers

Circuit breakers rated 15 amperes and intended to switch 277 volts or less fluorescent lighting loads shall be marked "SWD."

2.6.5 Omitted
2.6.6 Omitted
2.6.7 Omitted

2.6.8 Ground Fault Circuit Interrupters

UL 943. Breakers equipped with ground fault circuit interrupters shall have ground fault class, interrupting capacity, and voltage and current ratings as indicated.

2.7 OMITTED

2.8 CONDUIT AND TUBING

2.8.1 Electrical, Zinc-Coated Steel Metallic Tubing (EMT)

UL 797

2.8.2 Omitted
2.8.3 Omitted

2.8.4 Flexible Conduit, Steel and Plastic

General-purpose type, UL 1; liquid tight, UL 360, and UL 1660.

2.8.5 Omitted
2.8.6 Omitted
2.8.7 Omitted

2.8.8 Rigid Metal Conduit

UL 6.

2.8.9 Rigid Plastic Conduit

NEMA TC 2, UL 651 and UL 651A.

2.8.10 Surface Metal Electrical Raceways and Fittings

UL 5.

2.9 CONDUIT AND DEVICE BOXES AND FITTINGS

2.9.1 Boxes, Metallic Outlet

NEMA OS 1 and UL 514A.

2.9.2 Omitted
2.9.3 Omitted

2.9.4 Boxes, Switch (Enclosed), Surface-Mounted

UL 98.

2.9.5 Fittings for Conduit and Outlet Boxes

UL 514B.

2.9.6 Omitted

2.9.7 Fittings, PVC, for Use with Rigid PVC Conduit and Tubing

UL 514B.

2.10 CONDUIT COATINGS PLASTIC RESIN SYSTEM

NEMA RN 1, Type A-40.

2.11 CONNECTORS, WIRE PRESSURE

2.11.1 For Use With Copper Conductors

UL 486A.

2.12 ELECTRICAL GROUNDING AND BONDING EQUIPMENT

UL 467.

2.12.1 Ground Rods

Ground rods shall be of copper-clad steel conforming to UL 467, not less than 3/4 inch in diameter by 10 feet in length of the sectional type driven full length into the earth.

2.12.2 Ground Bus

The ground bus shall be flat copper in one piece.

2.13 ENCLOSURES

NEMA ICS 6 or NEMA 250, unless otherwise specified.

2.13.1 Cabinets and Boxes

Cabinets and boxes with volume greater than 100 cubic inches shall be in accordance with UL 50, hot-dip, zinc-coated, if sheet steel.

2.13.2 Circuit Breaker Enclosures

UL 489.

2.14 LIGHTING FIXTURES, LAMPS, BALLASTS, EMERGENCY EQUIPMENT, CONTROLS AND ACCESSORIES

The following specifications are supported and supplemented by information and details on the drawings. Additional fixtures, if shown, shall conform to this specification. Lighting equipment installed in classified hazardous locations shall conform to UL 844. Lamps, lampholders, ballasts, transformers, electronic circuitry and other lighting system components shall be constructed according to industry standards. Equipment shall be tested and listed by a recognized independent testing laboratory for the expected installation conditions. Equipment shall conform to the standards listed below.

2.14.1 Lamps

Lamps shall be constructed to operate in the specified fixture, and shall function without derating life or output as listed in published data. Lamps shall meet the requirements of the Energy Policy Act of 1992.

a. Incandescent and tungsten halogen lamps shall be designed for 125 volt operation (except for low voltage lamps), shall be rated for minimum life of 2,000 hours, and shall have color temperature between 2,800 and 3,200 degrees Kelvin. Tungsten halogen lamps shall incorporate quartz capsule construction. Lamps shall comply with ANSI C78.20 and sections 238 and 270 of ANSI C78.21.

b. Fluorescent lamps shall have color temperature of 3,500 degrees Kelvin. They shall be designed to operate with the ballasts and circuitry of the fixtures in which they will be used. Fluorescent lamps, including spares, shall be manufactured by one manufacturer to provide for color and performance consistency. Fluorescent lamps shall comply with ANSI C78.1. Fluorescent tube lamp efficiencies shall meet or exceed the following requirements.

T8, 32 watts	(4' lamp)	2800 lumens
T12,34 watts	(4' lamp)	2800 lumens
T8,59 watts	(8' lamp)	5700 lumens
T12,60 watts	(8' lamp)	5600 lumens
T8/U,31-32 watts	(U-tube)	2600 lumens
T12/U,34 watts	(U-tube)	2700 lumens

(1) Linear fluorescent lamps, unless otherwise indicated, shall be 4 feet long 32 watt T8, 265 mA, with minimum CRI of 85%. Lamps of other lengths or types shall be used only where specified or shown. Lamps shall deliver rated life when operated on rapid start ballasts.

(2) Small compact fluorescent lamps shall be twin, double, or triple tube configuration as shown with bi-pin or four-pin snap-in base and shall have minimum CRI of 85%. They shall deliver rated life when operated on ballasts as shown. 9 and 13 watt double tube lamps shall comply with ANSI C78.2B. 18 and 26 watt double tube lamps shall comply with ANSI C78.2A. Minimum starting temperature shall be 32 degrees F for twin tube lamps and for double and triple twin tube lamps without internal starter; and 15 degrees F for double and triple twin tube lamps with internal starter.

(3) Long compact fluorescent lamps shall be 18, 27, 39, 40, 50, or 55 watt bi-axial type as shown with four-pin snap-in base; shall have minimum CRI of 85%; and shall have a minimum starting temperature of 50 degrees F. They shall deliver rated life when operated on rapid start ballasts.

c. High intensity discharge lamps, including spares, shall be manufactured by one manufacturer in order to provide color and performance consistency. High intensity discharge lamps shall be designed to operate with the ballasts and circuitry of the fixtures in which they will be used and shall have wattage, shape and base as shown. High intensity discharge lamps, unless otherwise shown, shall have medium or mogul screw base and minimum starting temperature of -20 degrees F. Metal halide lamps, unless otherwise shown, shall have minimum CRI of 75%; color temperature of 4,300 degrees Kelvin; shall be -BU configuration if used in base-up position; and shall be -H or high output configuration if used in horizontal position. Lamps shall comply with all applicable ANSI C78.1350, ANSI C78.1351, ANSI C78.1352, ANSI C78.1355,ANSI C78.1375, and ANSI C78.1376.

2.14.2 Ballasts and Transformers

Ballasts or transformers shall be designed to operate the designated lamps

within their optimum specifications, without derating the lamps. Lamp and ballast combinations shall be certified as acceptable by the lamp manufacturer.

a. Low voltage incandescent transformers shall be Class II UL listed 120/12 volt or 120/24 volt step-down transformers as required for the lamps shown. Transformers shall be high power factor type and shall be rated for continuous operation under the specified load. Transformers shall be encased or encased and potted, and mounted integrally within the lighting fixture unless otherwise shown.

b. Fluorescent ballasts shall comply with ANSI C82.1 and shall be mounted integrally within fluorescent fixture housing unless otherwise shown. Ballasts shall have maximum current crest factor of 1.7; high power factor; Class A sound rating; maximum operating case temperature of 77 degrees F above ambient; and shall be rated Class P. Unless otherwise indicated, the minimum number of ballasts shall be used to serve each individual fixture. A single ballast may be used to serve multiple fixtures if they are continuously mounted, identically controlled and factory manufactured for that installation with an integral wireway.

(1) Compact fluorescent ballasts shall comply with IEEE C62.41 Category A transient voltage variation requirements and shall be mounted integrally within compact fluorescent fixture housing unless otherwise shown. Ballasts shall have minimum ballast factor of 0.95; maximum current crest factor of 1.6; high power factor; maximum operating case temperature of 77 degrees F above ambient; shall be rated Class P; and shall have a sound rating of Class A. Ballasts shall meet FCC Class A specifications for EMI/RFI emissions. Ballasts shall operate from nominal line voltage of 277 volts at 60 Hz and maintain constant light output over a line voltage variation of ± 10%. Ballasts shall have an end-of-lamp-life detection and shut-down circuit. Ballasts shall be UL listed and shall contain no PCBs. Ballasts shall contain potting to secure PC board, provide lead strain relief, and provide a moisture barrier.

(2) Electronic fluorescent ballasts shall comply with 47 CFR 18 for electromagnetic interference. Ballasts shall withstand line transients per IEEE C62.41, Category A. Ballasts shall have total harmonic distortion between 10 and 20%; minimum frequency of 20,000Hz; filament voltage between 2.5 and 4.5 volts; maximum starting inrush current of 20 amperes; and shall comply with the minimum Ballast Efficacy Factors shown in the table below. Minimum starting temperature shall be 50 degrees F. Ballasts shall carry a manufacturer's full warranty of three years, including a minimum $10 labor allowance per ballast.

ELECTRONIC FLUORESCENT BALLAST EFFICACY FACTORS

LAMP TYPE	TYPE OF STARTER & LAMP	NOMINAL OPERATIONAL VOLTAGE	NUMBER OF LAMPS	MINIMUM BALLAST EFFICACY FACTOR
32W T8	rapid start	120 or 277 V	1	2.54
			2	1.44

ELECTRONIC FLUORESCENT BALLAST EFFICACY FACTORS

	linear & U-tubes		3	0.93
			4	0.73
34W T12	rapid start linear & U-tubes	120 or 277 V	1	2.64
			2	1.41
			3	0.93
59W T8	rapid start linear	120 or 277 V	2	0.80
60W T12	rapid start linear	120 or 277 V	2	0.80

(4) Dimming fluorescent ballasts shall be electronic and shall comply with the applicable electronic ballast specifications shown above. Dimming ballasts shall be compatible with the specified dimming control equipment and shall operate the lamps shown in the range from full rated light output to 1 percent of full rated light output. Dimming ballasts shall provide smooth square law dimming such that perceived dimming action is proportionate to the motion of the dimming control. Single or two-lamp dimming ballasts shall be used. Multi-lamp dimming ballasts shall be designed to operate lamps of the same length and current rating.

(5) Dimming compact fluorescent ballasts shall be electronic and shall comply with the applicable compact fluorescent and dimming ballast specifications shown above. Ballasts shall operate the lamps shown in the range from full rated light output to 5 percent of full rated light output. Ballast power factor shall be <90% throughout dimming range. THD shall be <10% at maximum light output and <20% at minimum light output. Ballast shall ignite the lamps at any light output setting selected.

c. High intensity discharge ballasts shall comply with UL 1029 and, if multiple supply types, with ANSI C82.4. Ballasts shall have minimum ballast factor of 0.9; high power factor; Class A sound rating; and maximum operating case temperature of 77 degrees F above ambient.

(1) Electronic high intensity discharge ballasts shall be constant wattage autotransformer type; shall have less than 10% ballast loss; shall have total harmonic distortion between 10 and 20%; and shall have a minimum starting temperature of 0 degrees F.

(2) Magnetic high intensity discharge ballasts shall have a minimum starting temperature of -20 degrees F.

2.14.3 Fixtures

Fixtures shall be in accordance with the size, shape, appearance, finish, and performance shown. Unless otherwise indicated, lighting fixtures shall be provided with housings, junction boxes, wiring, lampholders, mounting

supports, trim, hardware and accessories for a complete and operable installation. Recessed housings shall be minimum 20 gauge cold rolled or galvanized steel as shown. Extruded aluminum fixtures shall have minimum wall thickness of 0.125 inches. Plastic lenses shall be 100% virgin acrylic or as shown. Glass lenses shall be tempered. Heat resistant glass shall be borosilicate type. Conoid recessed reflector cones shall be Alzak with clear specular low iridescent finish.

a. Incandescent fixtures shall comply with UL 1571. Incandescent fixture specular reflector cone trims shall be integral to the cone and shall be finished to match. Painted trim finishes shall be white with minimum reflectance of 88%. Low voltage incandescent fixtures shall have integral step-down transformers.

b. Fluorescent fixtures shall comply with UL 1570. Recessed ceiling fixtures shall comply with NEMA LE 4. Fixtures shall be plainly marked for proper lamp and ballast type to identify lamp diameter, wattage, color and start type. Marking shall be readily visible to service personnel, but not visible from normal viewing angles. Fluorescent fixture lens frames on recessed and surface mounted troffers shall be one assembly with mitered corners. Parabolic louvers shall have a low iridescent finish and 45 degree cut-off. Louver intersection joints shall be hairline type and shall conceal mounting tabs or other assembly methods. Louvers shall be free from blemishes, lines or defects which distort the visual surface. Integral ballast and wireway compartments shall be easily accessible without the use of special tools. Housings shall be constructed to include grounding necessary to start the lamps. Open fixtures shall be equipped with a sleeve, wire guard, or other positive means to prevent lamps from falling. Medium bi-pin lampholders shall be twist-in type with positive locking position. Long compact fluorescent fixtures and fixtures utilizing U-bend lamps shall have clamps or secondary lampholders to support the free ends of the lamps.

c. High intensity discharge fixture shall comply with UL 1572. Recessed ceiling fixtures shall comply with NEMA LE 4. Reflectors shall be anodized aluminum. Fixtures for horizontal lamps shall have position oriented lampholders. Lampholders shall be pulse-rated to 5,000 volts. Fixtures indicated as classified or rated for hazardous locations or special service shall be designed and independently tested for the environment in which they are installed. Recessed lens fixtures shall have extruded aluminum lens frames. Ballasts shall be integral to fixtures and shall be accessible without the use of special tools. Remote ballasts shall be encased and potted. Lamps shall be shielded from direct view with a UV absorbing material such as tempered glass, and shall be circuited through a cut-off switch which will shut off the lamp circuit if the lens is not in place.

d. Emergency lighting fixtures and accessories shall be constructed and independently tested to meet the requirements of applicable codes. Batteries shall be Nicad or equal with no required maintenance, and shall have a minimum life expectancy of five years and warranty period of three years.

e. Exit Signs

Exit signs shall be ENERGY STAR compliant, thereby meeting the following

requirements. Input power shall be less than 5 watts per face. Letter size and spacing shall adhere to NFPA 101. Luminance contrast shall be greater than 0.8. Average luminance shall be greater than 15 cd/m^2 measured at normal (0 degree) and 45 degree viewing angles. Minimum luminance shall be greater than 8.6 cd/m^2 measured at normal and 45 degree viewing angles. Maximum to minimum luminance shall be less than 20:1 measured at normal and 45 degree viewing angles. The manufacturer warranty for defective parts shall be at least 5 years.

2.14.4 Lampholders, Starters, and Starter Holders

UL 542

2.14.5 Ultrasonic, and Passive Infrared Occupancy Sensors

UL 916

2.15 LOW-VOLTAGE FUSES AND FUSEHOLDERS

2.15.1 Fuses, Low Voltage Cartridge Type

NEMA FU 1.

2.15.2 Fuses, High-Interrupting-Capacity, Current-Limiting Type

Fuses, Class G, J, L and CC shall be in accordance with UL 198C.

2.15.3 Fuses, Class K, High-Interrupting-Capacity Type

UL 198D.

2.15.4 Fuses, Class H

UL 198B.

2.15.5 Fuses, Class R

UL 198E.

2.15.6 Fuses, Class T

UL 198H.

2.15.7 Fuses for Supplementary Overcurrent Protection

UL 198G.

2.15.8 Fuses, D-C for Industrial Use

UL 198L.

2.15.9 Fuseholders

UL 512.

2.16 OMITTED
2.17 OMITTED
2.18 OMITTED

2.19 PANELBOARDS

Dead-front construction, NEMA PB 1 and UL 67.

2.20 RECEPTACLES

2.20.1 Omitted

2.20.2 Heavy Duty Grade

NEMA WD 1. Devices shall conform to all requirements for heavy duty receptacles.

2.20.3 Standard Grade

UL 498.

2.20.4 Ground Fault Interrupters

UL 943, Class A or B.

2.20.5 Omitted

2.20.6 NEMA Standard Receptacle Configurations

NEMA WD 6.

a. Single and Duplex, 20-Ampere, 125 Volt

20-ampere, non-locking: NEMA type 5-20R, locking: NEMA type L5-20R.

b. 15-Ampere, 250 Volt

Two-pole, 3-wire grounding, non-locking: NEMA type 6-15R, locking: NEMA type L6-15R. Three-pole, 4-wire grounding, non-locking: NEMA type 15-15R, locking: NEMA type L15-15R.

c. 20-Ampere, 250 Volt

Two-pole, 3-wire grounding, non-locking: NEMA type 6-20R, locking: NEMA type L6-20R. Three-pole, 4-wire grounding, non-locking: NEMA type 15-20R, locking: NEMA type L15-20R.

d. 30-Ampere, 125/250 Volt

Three-pole, 3-wire, non-locking: NEMA type 10-30R, locking: NEMA type L10-30R. Three-pole, 4-wire grounding, non-locking: NEMA type 14-30R, locking: NEMA type L14-30R.

e. 30-Ampere, 250 Volt

Two-pole, 3-wire grounding, non-locking: NEMA type 6-30R, locking: NEMA type L6-30R. Three-pole, 4-wire grounding, non-locking: NEMA type 15-30R, locking: NEMA type L15-30R.

2.21 OMITTED

2.22 SPLICE, CONDUCTOR

UL 486C.

2.23 OMITTED

2.24 SNAP SWITCHES

UL 20.

2.25 TAPES

2.25.1 Plastic Tape

UL 510.

2.25.2 Rubber Tape

UL 510.

2.26 OMITTED
2.27 OMITTED
2.28 OMITTED
2.29 OMITTED
2.30 OMITTED

2.31 WIRING DEVICES

NEMA WD 1 for wiring devices, and NEMA WD 6 for dimensional requirements of wiring devices.

PART 3 EXECUTION

3.1 GROUNDING

Grounding shall be in conformance with NFPA 70, the contract drawings, and the following specifications.

3.1.1 Ground Rods

The resistance to ground shall be measured using the fall-of-potential method described in IEEE Std 81. The maximum resistance of a driven ground shall not exceed 25 ohms under normally dry conditions. If this resistance cannot be obtained with a single rod, 2 additional rods not less than 6 feet on centers may be coupled and driven with the first rod. In high-ground-resistance, UL listed chemically charged ground rods may be used. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Contracting Officer shall be notified immediately. Connections below grade shall be fusion welded. Connections above grade shall be fusion welded or shall use UL 467 approved connectors.

3.1.2 Ground Bus

Ground bus shall be provided in the electrical equipment rooms as indicated. Noncurrent-carrying metal parts of electrical equipment shall be effectively grounded by bonding to the ground bus. The ground bus shall be bonded to both the entrance ground, and to a ground rod or rods as

specified above having the upper ends terminating approximately 4 inches above the floor. Connections and splices shall be of the brazed, welded, bolted, or pressure-connector type, except that pressure connectors or bolted connections shall be used for connections to removable equipment. For raised floor equipment rooms in computer and data processing centers, a minimum of 4, one at each corner, multiple grounding systems shall be furnished. Connections shall be bolted type in lieu of thermoweld, so they can be changed as required by additions and/or alterations.

3.1.3 Grounding Conductors

A green equipment grounding conductor, sized in accordance with NFPA 70 shall be provided, regardless of the type of conduit. Equipment grounding bars shall be provided in all panelboards. The equipment grounding conductor shall be carried back to the service entrance grounding connection or separately derived grounding connection. All equipment grounding conductors, including metallic raceway systems used as such, shall be bonded or joined together in each wiring box or equipment enclosure. Metallic raceways and grounding conductors shall be checked to assure that they are wired or bonded into a common junction. Metallic boxes and enclosures, if used, shall also be bonded to these grounding conductors by an approved means per NFPA 70. When switches, or other utilization devices are installed, any designated grounding terminal on these devices shall also be bonded to the equipment grounding conductor junction with a short jumper.

3.2 WIRING METHODS

Wiring shall conform to NFPA 70, the contract drawings, and the following specifications. Unless otherwise indicated, wiring shall consist of insulated conductors installed in rigid zinc-coated steel conduit, electrical metallic tubing, or intermediate metal conduit. Where cables and wires are installed in cable trays, they shall be of the type permitted by NFPA 70 for use in such applications. Metallic-armored cables may be installed in areas permitted by NFPA 70. Wire fill in conduits shall be based on NFPA 70 for the type of conduit and wire insulations specified. Wire fill in conduits located in Class I or II hazardous areas shall be limited to 25 percent of the cross sectional area of the conduit.

3.2.1 Conduit and Tubing Systems

Conduit and tubing systems shall be installed as indicated. Conduit sizes shown are based on use of copper conductors with insulation types as described in paragraph WIRING METHODS. Minimum size of raceways shall be 1/2 inch. Only metal conduits will be permitted when conduits are required for shielding or other special purposes indicated, or when required by conformance to NFPA 70. Nonmetallic conduit and tubing may be used in damp, wet or corrosive locations when permitted by NFPA 70 and the conduit or tubing system is provided with appropriate boxes, covers, clamps, screws or other appropriate type of fittings. Electrical metallic tubing (EMT) may be installed only within buildings. EMT may be installed in concrete and grout in dry locations. EMT installed in concrete or grout shall be provided with concrete tight fittings. EMT shall not be installed in damp or wet locations, or the air space of exterior masonry cavity walls. Bushings, manufactured fittings or boxes providing equivalent means of protection shall be installed on the ends of all conduits and shall be of the insulating type, where required by NFPA 70. Only UL listed adapters shall be used to connect EMT to rigid metal conduit, cast boxes, and conduit bodies. Aluminum conduit may be used only where installed exposed

in dry locations. Nonaluminum sleeves shall be used where aluminum conduit passes through concrete floors and firewalls. Penetrations of above grade floor slabs, time-rated partitions and fire walls shall be firestopped in accordance with Section 07840A FIRESTOPPING. Except as otherwise specified, IMC may be used as an option for rigid steel conduit in areas as permitted by NFPA 70. Raceways shall not be installed under the firepits of boilers and furnaces and shall be kept 6 inches away from parallel runs of flues, steam pipes and hot-water pipes. Raceways shall be concealed within finished walls, ceilings, and floors unless otherwise shown. Raceways crossing structural expansion joints or seismic joints shall be provided with suitable expansion fittings or other suitable means to compensate for the building expansion and contraction and to provide for continuity of grounding.

3.2.1.1 Pull Wires

A pull wire shall be inserted in each empty raceway in which wiring is to be installed if the raceway is more than 50 feet in length and contains more than the equivalent of two 90-degree bends, or where the raceway is more than 150 feet in length. The pull wire shall be of No. 14 AWG zinc-coated steel, or of plastic having not less than 200 pounds per square inch tensile strength. Not less than 10 inches of slack shall be left at each end of the pull wire.

3.2.1.2 Omitted
3.2.1.3 Omitted
3.2.1.4 Omitted

3.2.1.5 Changes in Direction of Runs

Changes in direction of runs shall be made with symmetrical bends or cast-metal fittings. Field-made bends and offsets shall be made with an approved hickey or conduit-bending machine. Crushed or deformed raceways shall not be installed. Trapped raceways in damp and wet locations shall be avoided where possible. Lodgment of plaster, dirt, or trash in raceways, boxes, fittings and equipment shall be prevented during the course of construction. Clogged raceways shall be cleared of obstructions or shall be replaced.

3.2.1.6 Supports

Metallic conduits and tubing,and the support system to which they are attached, shall be securely and rigidly fastened in place to prevent vertical and horizontal movement at intervals of not more than 10 feet and within 3 feet of boxes, cabinets, and fittings, with approved pipe straps, wall brackets, conduit clamps, conduit hangers, threaded C-clamps, beam clamps, or ceiling trapeze. Loads and supports shall be coordinated with supporting structure to prevent damage or deformation to the structure. Loads shall not be applied to joist bridging. Attachment shall be by wood screws or screw-type nails to wood; by toggle bolts on hollow masonry units; by expansion bolts on concrete or brick; by machine screws, welded threaded studs, heat-treated or spring-steel-tension clamps on steel work. Nail-type nylon anchors or threaded studs driven in by a powder charge and provided with lock washers and nuts may be used in lieu of expansion bolts or machine screws. Raceways or pipe straps shall not be welded to steel structures. Cutting the main reinforcing bars in reinforced concrete beams or joists shall be avoided when drilling holes for support anchors. Holes drilled for support anchors, but not used, shall be filled. In partitions of light steel construction, sheet-metal screws may be used. Raceways

shall not be supported using wire or nylon ties. Raceways shall be independently supported from the structure. Upper raceways shall not be used as a means of support for lower raceways. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts. Cables and raceways shall not be supported by ceiling grids. Except where permitted by NFPA 70, wiring shall not be supported by ceiling support systems. Conduits shall be fastened to sheet-metal boxes and cabinets with two locknuts where required by NFPA 70, where insulating bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, a single locknut and bushing may be used. Threadless fittings for electrical metallic tubing shall be of a type approved for the conditions encountered. Additional support for horizontal runs is not required when EMT rests on steel stud cutouts.

3.2.1.7 Exposed Raceways

Exposed raceways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Raceways under raised floors and above accessible ceilings shall be considered as exposed installations in accordance with NFPA 70 definitions.

3.2.2 Omitted
3.2.3 Omitted

3.2.4 Cables and Conductors

Installation shall conform to the requirements of NFPA 70. Covered, bare or insulated conductors of circuits rated over 600 volts shall not occupy the same equipment wiring enclosure, cable, or raceway with conductors of circuits rated 600 volts or less.

3.2.4.1 Sizing

Unless otherwise noted, all sizes are based on copper conductors and the insulation types indicated. Sizes shall be not less than indicated. Branch-circuit conductors shall be not smaller than No. 12 AWG. Conductors for branch circuits of 120 volts more than 100 feet long and of 277 volts more than 230 feet long, from panel to load center, shall be no smaller than No. 10 AWG. Class 1 remote control and signal circuit conductors shall be not less than No. 14 AWG. Class 2 remote control and signal circuit conductors shall be not less than No. 16 AWG. Class 3 low-energy, remote-control and signal circuits shall be not less than No. 22 AWG.

3.2.4.2 Use of Aluminum Conductors in Lieu of Copper

Aluminum conductors shall not be used.

3.2.4.3 Cable Systems

Cable systems shall be installed where indicated. Cables shall be installed concealed behind ceiling or wall finish where practicable. Cables shall be threaded through holes bored on the approximate centerline of wood members; notching of surfaces will not be permitted. Sleeves shall be provided through bond beams of masonry-block walls for threading cables through hollow spaces. Exposed cables shall be installed parallel or at right angles to walls or structural members. In rooms or areas not provided with ceiling or wall finish, cables and outlets shall be installed so that a room finish may be applied in the future without disturbing the cables or resetting the boxes. Exposed nonmetallic-sheathed cables less

than 4 feet above floors shall be protected from mechanical injury by installation in conduit or tubing.

3.2.4.4 Omitted

3.2.4.5 Cable Splicing

Splices shall be made in an accessible location. Crimping tools and dies shall be approved by the connector manufacturer for use with the type of connector and conductor.

a. Copper Conductors, 600 Volt and Under: Splices in conductors No. 10 AWG and smaller diameter shall be made with an insulated, pressure-type connector. Splices in conductors No. 8 AWG and larger diameter shall be made with a solderless connector and insulated with tape or heat-shrink type insulating material equivalent to the conductor insulation.

3.2.4.6 Conductor Identification and Tagging

Power, control, and signal circuit conductor identification shall be provided within each enclosure where a tap, splice, or termination is made. Where several feeders pass through a common pull box, the feeders shall be tagged to indicate clearly the electrical characteristics, circuit number, and panel designation. Phase conductors of low voltage power circuits shall be identified by color coding. Phase identification by a particular color shall be maintained continuously for the length of a circuit, including junctions.

a. Color coding shall be provided for service, feeder, branch, and ground conductors. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in the same raceway or box, other neutral shall be white with colored (not green) stripe. The color coding for 3-phase and single-phase low voltage systems shall be as follows:

   120/208-volt, 3-phase: Black(A), red(B), and blue(C).
   277/480-volt, 3-phase: Brown(A), orange(B), and yellow(C).

b. Conductor phase and voltage identification shall be made by color-coded insulation for all conductors smaller than No. 6 AWG. For conductors No. 6 AWG and larger, identification shall be made by color-coded insulation, or conductors with black insulation may be furnished and identified by the use of half-lapped bands of colored electrical tape wrapped around the insulation for a minimum of 3 inches of length near the end, or other method as submitted by the Contractor and approved by the Contracting Officer.

c. Control and signal circuit conductor identification shall be made by color-coded insulated conductors, plastic-coated self-sticking printed markers, permanently attached stamped metal foil markers, or equivalent means as approved. Control circuit terminals of equipment shall be properly identified. Terminal and conductor identification shall match that shown on approved detail drawings. Hand lettering or marking is not acceptable.

3.3 BOXES AND SUPPORTS

Boxes shall be provided in the wiring or raceway systems where required by NFPA 70 for pulling of wires, making connections, and mounting of devices or fixtures. Pull boxes shall be furnished with screw-fastened covers. Indicated elevations are approximate, except where minimum mounting heights for hazardous areas are required by NFPA 70. Unless otherwise indicated, boxes for wall switches shall be mounted 48 inches above finished floors. Switch and outlet boxes located on opposite sides of fire rated walls shall be separated by a minimum horizontal distance of 24 inches. The total combined area of all box openings in fire rated walls shall not exceed 100 square inches per 100 square feet. Maximum box areas for individual boxes in fire rated walls vary with the manufacturer and shall not exceed the maximum specified for that box in UL Elec Const Dir. Only boxes listed in UL Elec Const Dir shall be used in fire rated walls.

3.3.1 Box Applications

Each box shall have not less than the volume required by NFPA 70 for number of conductors enclosed in box. Boxes for metallic raceways shall be listed for the intended use when located in normally wet locations, when flush or surface mounted on outside of exterior surfaces, or when located in hazardous areas. Boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces shall be gasketed. Boxes for mounting lighting fixtures shall be not less than 4 inches square, or octagonal, except smaller boxes may be installed as required by fixture configuration, as approved. Cast-metal boxes with 3/32 inch wall thickness are acceptable. Large size boxes shall be as shown. Boxes in other locations shall be sheet steel except that aluminum boxes may be used with aluminum conduit, and nonmetallic boxes may be used with nonmetallic conduit and tubing or nonmetallic sheathed cable system, when permitted by NFPA 70. Boxes for use in masonry-block or tile walls shall be square-cornered, tile-type, or standard boxes having square-cornered, tile-type covers.

3.3.2 Brackets and Fasteners

Boxes and supports shall be fastened to wood with wood screws or screw-type nails of equal holding strength, with bolts and metal expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screw or welded studs on steel work. Threaded studs driven in by powder charge and provided with lockwashers and nuts, or nail-type nylon anchors may be used in lieu of expansion shields, or machine screws. Penetration of more than 1-1/2 inches into reinforced-concrete beams or more than 3/4 inch into reinforced-concrete joists shall avoid cutting any main reinforcing steel. The use of brackets which depend on gypsum wallboard or plasterboard for primary support will not be permitted. In partitions of light steel construction, bar hangers with 1 inch long studs, mounted between metal wall studs or metal box mounting brackets shall be used to secure boxes to the building structure. When metal box mounting brackets are used, additional box support shall be provided on the side of the box opposite the brackets. This additional box support shall consist of a minimum 12 inch long section of wall stud, bracketed to the opposite side of the box and secured by two screws through the wallboard on each side of the stud. Metal screws may be used in lieu of the metal box mounting brackets.

3.3.3 Mounting in Walls, Ceilings, or Recessed Locations

In walls or ceilings of concrete, tile, or other non-combustible material, boxes shall be installed so that the edge of the box is not recessed more than 1/4 inch from the finished surface. Boxes mounted in combustible walls or ceiling material shall be mounted flush with the finished surface. The use of gypsum or plasterboard as a means of supporting boxes will not be permitted. Boxes installed for concealed wiring shall be provided with suitable extension rings or plaster covers, as required. The bottom of boxes installed in masonry-block walls for concealed wiring shall be mounted flush with the top of a block to minimize cutting of the blocks, and boxes shall be located horizontally to avoid cutting webs of block. Separate boxes shall be provided for flush or recessed fixtures when required by the fixture terminal operating temperature, and fixtures shall be readily removable for access to the boxes unless ceiling access panels are provided.

3.3.4 Installation in Overhead Spaces

In open overhead spaces, cast-metal boxes threaded to raceways need not be separately supported except where used for fixture support; cast-metal boxes having threadless connectors and sheet metal boxes shall be supported directly from the building structure or by bar hangers. Hangers shall not be fastened to or supported from joist bridging. Where bar hangers are used, the bar shall be attached to raceways on opposite sides of the box and the raceway shall be supported with an approved type fastener not more than 24 inches from the box.

3.4 DEVICE PLATES

One-piece type device plates shall be provided for all outlets and fittings. Plates on unfinished walls and on fittings shall be of zinc-coated sheet steel, cast-metal, or impact resistant plastic having rounded or beveled edges. Plates on finished walls shall be of steel with baked enamel finish or impact-resistant plastic and shall be ivory. Screws shall be of metal with countersunk heads, in a color to match the finish of the plate. Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1/16 inch. The use of sectional-type device plates will not be permitted. Plates installed in wet locations shall be gasketed and provided with a hinged, gasketed cover, unless otherwise specified.

3.5 RECEPTACLES

3.5.1 Single and Duplex, 15 or 20-ampere, 125 volt

Single and duplex receptacles shall be rated 20 amperes, 125 volts, two-pole, three-wire, grounding type with polarized parallel slots. Bodies shall be of ivory to match color of switch handles in the same room or to harmonize with the color of the respective wall, and supported by mounting strap having plaster ears. Contact arrangement shall be such that contact is made on two sides of an inserted blade. Receptacle shall be side- or back-wired with two screws per terminal. The third grounding pole shall be connected to the metal mounting yoke. Switched receptacles shall be the same as other receptacles specified except that the ungrounded pole of each suitable receptacle shall be provided with a separate terminal. Only the top receptacle of a duplex receptacle shall be wired for switching

application. Receptacles with ground fault circuit interrupters shall have the current rating as indicated, and shall be UL Class A type unless otherwise shown. Ground fault circuit protection shall be provided as required by NFPA 70 and as indicated on the drawings.

3.5.2 Omitted
3.5.3 Omitted

3.5.4 Weatherproof Applications

Weatherproof receptacles shall be suitable for the environment, damp or wet as applicable, and the housings shall be labeled to identify the allowable use. Receptacles shall be marked in accordance with UL 514A for the type of use indicated; "Damp locations", "Wet Locations", "Wet Location Only When Cover Closed". Assemblies shall be installed in accordance with the manufacturer's recommendations.

3.5.4.1 Damp Locations

Receptacles in damp locations shall be mounted in an outlet box with a gasketed, weatherproof, cast-metal cover plate (device plate, box cover) and a gasketed cap (hood, receptacle cover) over each receptacle opening. The cap shall be either a screw-on type permanently attached to the cover plate by a short length of bead chain or shall be a flap type attached to the cover with a spring loaded hinge.

3.5.5 Receptacles, 15-Ampere, 250-Volt

Receptacles, 15-ampere, 250-volt, shall be duplex two-pole, three-wire, grounding type with bodies of ivory phenolic compound supported by mounting yoke having plaster ears. The third grounding pole shall be connected to the metal yoke. Each receptacle shall be provided with a mating cord-grip plug.

3.5.6 Receptacles, 20-Ampere, 250-Volt

Receptacles, single, 20-ampere, 250-volt, shall be ivory molded plastic, two-pole, three-wire or three-pole, four-wire, grounding type complete with appropriate mating cord-grip plug.

3.5.7 Receptacles, 30-Ampere, 125/250-Volt

Receptacles, single, 30-ampere, 125/250-volt, shall be molded-plastic, three-pole, four-wire, grounding type, complete with appropriate mating cord-grip type attachment plug. Each dryer receptacle shall be furnished with a non-detachable power supply cord for connection to the electric clothes dryer. The cord shall be an angle-type 36 inch length of Type SRDT range and dryer cable with three No. 10 AWG conductors.

3.5.8 Receptacles, 30-Ampere, 250-Volt

Receptacles, single, 30-ampere, 250-volt, shall be molded-plastic, three-pole, three-wire type, complete with appropriate mating cord-grip plug.

3.6 WALL SWITCHES

Wall switches shall be of the totally enclosed tumbler type. The wall switch handle and switch plate color shall be ivory. Wiring terminals

shall be of the screw type or of the solderless pressure type having suitable conductor-release arrangement. Not more than one switch shall be installed in a single-gang position. Switches shall be rated 20-ampere 277-volt for use on alternating current only. Pilot lights indicated shall consist of yoke-mounted candelabra-base sockets rated at 75 watts, 125 volts, and fitted with glass or plastic jewels. A clear 6-watt lamp shall be furnished and installed in each pilot switch. Jewels for use with switches controlling motors shall be green, and jewels for other purposes shall be red. Dimming switches shall be solid-state flush mounted, sized for the loads.

3.7 OMITTED

3.8 PANELBOARDS AND LOADCENTERS

Circuit breakers and switches used as a motor disconnecting means shall be capable of being locked in the open position. Door locks shall be keyed alike. Nameplates shall be as approved. Directories shall be typed to indicate loads served by each circuit and mounted in a holder behind a clear protective covering. Busses shall be copper.

3.8.1 Loadcenters

Loadcenters shall be circuit breaker equipped.

3.8.2 Panelboards

Panelboards shall be circuit breaker equipped as indicated on the drawings.

3.9 FUSES

Equipment provided under this contract shall be provided with a complete set of properly rated fuses when the equipment manufacturer utilize fuses in the manufacture of the equipment, or if current-limiting fuses are required to be installed to limit the ampere-interrupting capacity of circuit breakers or equipment to less than the maximum available fault current at the location of the equipment to be installed. Fuses shall have a voltage rating of not less than the phase-to-phase circuit voltage, and shall have the time-current characteristics required for effective power system coordination. Time-delay and non-time-delay options shall be as shown.

3.9.1 Cartridge Fuses; Noncurrent-Limiting Type

Cartridge fuses of the noncurrent-limiting type shall be Class H, nonrenewable, dual element, time lag type and shall have interrupting capacity of 10,000 amperes. At 500 percent current, cartridge fuses shall not blow in less than 10 seconds.

3.9.2 Cartridge Fuses; Current-Limiting Type

Cartridge fuses, current-limiting type, Class RK5 shall have tested interrupting capacity not less than 100,000 amperes. Fuse holders shall be the type that will reject all Class H fuses.

3.9.3 Continuous Current Ratings (600 Amperes and Smaller)

Service entrance and feeder circuit fuses (600 amperes and smaller) shall be Class RK5, current-limiting, nontime-delay with 200,000 amperes

interrupting capacity.

3.9.4 Omitted

3.9.5 Motor and Transformer Circuit Fuses

Motor, motor controller, transformer, and inductive circuit fuses shall be Class RK1 or RK5, current-limiting, time-delay with 200,000 amperes interrupting capacity.

3.10 OMITTED
3.11 OMITTED
3.12 OMITTED
3.13 OMITTED

3.14 MOTOR-DISCONNECT MEANS

Each motor shall be provided with a disconnecting means when required by NFPA 70 even though not indicated. For single-phase motors, a single or double pole toggle switch, rated only for alternating current, will be acceptable for capacities less than 30 amperes, provided the ampere rating of the switch is at least 125 percent of the motor rating. Switches shall disconnect all ungrounded conductors.

3.15 OMITTED

3.16 LIGHTING FIXTURES, LAMPS AND BALLASTS

This paragraph shall cover the installation of lamps, lighting fixtures and ballasts in interior or building mounted applications.

3.16.1 Lamps

Lamps of the type, wattage, and voltage rating indicated shall be delivered to the project in the original cartons and installed just prior to project completion. Lamps installed and used for working light during construction shall be replaced prior to turnover to the Government if more than 15% of their rated life has been used. Lamps shall be tested for proper operation prior to turn-over and shall be replaced if necessary with new lamps from the original manufacturer. 10% spare lamps of each type, from the original manufacturer, shall be provided.

3.16.2 Lighting Fixtures

Fixtures shall be as shown and shall conform to the following specifications and shall be as detailed on the drawings. Illustrations shown on the drawings are indicative of the general type desired and are not intended to restrict selection to fixtures of any particular manufacturer. Fixtures of similar designs and equivalent energy efficiency, light distribution and brightness characteristics, and of equal finish and quality will be acceptable if approved. In suspended acoustical ceilings with fluorescent fixtures, the fluorescent emergency light fixtures shall be furnished with self-contained battery packs.

3.16.2.1 Accessories

Accessories such as straps, mounting plates, nipples, or brackets shall be provided for proper installation.

3.16.2.2 Ceiling Fixtures

Ceiling fixtures shall be coordinated with and suitable for installation in, on or from the ceiling as shown. Installation and support of fixtures shall be in accordance with NFPA 70 and manufacturer's recommendations. Where seismic requirements are specified herein, fixtures shall be supported as shown or specified. Recessed fixtures shall have adjustable fittings to permit alignment with ceiling panels. Recessed fixtures installed in fire-resistive ceiling construction shall have the same fire rating as the ceiling or shall be provided with fireproofing boxes having materials of the same fire rating as the ceiling, in conformance withUL Elec Const Dir. Surface-mounted fixtures shall be suitable for fastening to the ceiling panel structural supports.

3.16.2.3 Fixtures for Installation in Grid Type Ceilings

Fixtures for installation in grid type ceilings which are smaller than a full tile shall be centered in the tile. 1 by 4 foot fixtures shall be mounted along the grid rail as shown. Work above the ceiling shall be coordinated among the trades to provide the lighting layout shown. Fixtures mounted to the grid shall have trim exactly compatible with the grid. Contractor shall coordinate trims with ceiling trades prior to ordering fixtures. Metric fixtures shall be designed to fit the metric grid specified. Fixtures in continuous rows shall be coordinated between trades prior to ordering. Fixtures shall be mounted using independent supports capable of supporting the entire weight of the fixture. No fixture shall rest solely on the ceiling grid. Recessed fixtures installed in seismic areas should be installed utilizing specially designed seismic clips. Junction boxes shall be supported at four points.

3.16.2.4 Suspended Fixtures

Suspended fixtures shall be provided with swivel hangers or hand-straights so that they hang plumb. Pendants, rods, or chains 4 feet or longer excluding fixture shall be braced to prevent swaying using three cables at 120 degrees of separation. Suspended fixtures in continuous rows shall have internal wireway systems for end to end wiring and shall be properly aligned to provide a straight and continuous row without bends, gaps, light leaks or filler pieces. Aligning splines shall be used on extruded aluminum fixtures to assure hairline joints. Steel fixtures shall be supported to prevent "oil-canning" effects. Fixture finishes shall be free of scratches, nicks, dents, and warps, and shall match the color and gloss specified. Pendants shall be finished to match fixtures. Aircraft cable shall be stainless steel. Canopies shall be finished to match the ceiling and shall be low profile unless otherwise shown. Maximum distance between suspension points shall be 10 feet or as recommended by the manufacturer, whichever is less.

Suspended fixtures installed in seismic areas shall have 45% swivel hangers and shall be located with no obstructions within the 45% range in all directions. The stem, canopy and fixture shall be capable of 45% swing.

3.16.3 Ballasts

Remote type ballasts or transformers, where indicated, shall be mounted in a well ventilated, easily accessible location, within the maximum operating distance from the lamp as designated by the manufacturer.

3.16.4 Emergency Light Sets

Emergency light sets shall conform to UL 924 with the number of heads as indicated. Sets shall be permanently connected to the wiring system by conductors installed in short lengths of flexible conduit.

3.17 BATTERY CHARGERS

Battery chargers shall be installed in conformance with NFPA 70.

3.18 EQUIPMENT CONNECTIONS

Wiring not furnished and installed under other sections of the specifications for the connection of electrical equipment as indicated on the drawings shall be furnished and installed under this section of the specifications. Connections shall comply with the applicable requirements of paragraph WIRING METHODS. Flexible conduits 6 feet or less in length shall be provided to all electrical equipment subject to periodic removal, vibration, or movement and for all motors. All motors shall be provided with separate grounding conductors. Liquid-tight conduits shall be used in damp or wet locations.

3.18.1 Omitted

3.18.2 Installation of Government-Furnished Equipment

Wiring shall be extended to the equipment and terminated.

3.18.3 Food Service Equipment Provided Under Other Sections

Wiring shall be extended to the equipment and terminated.

3.19 CIRCUIT PROTECTIVE DEVICES

The Contractor shall calibrate, adjust, set and test each new adjustable circuit protective device to ensure that they will function properly prior to the initial energization of the new power system under actual operating conditions.

3.20 PAINTING AND FINISHING

Field-applied paint on exposed surfaces shall be provided under Section 09900 PAINTS AND COATINGS.

3.21 REPAIR OF EXISTING WORK

The work shall be carefully laid out in advance, and where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceiling, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, this work shall be carefully done, and any damage to building, piping, or equipment shall be repaired by skilled mechanics of the trades involved at no additional cost to the Government.

3.22 FIELD TESTING

Field testing shall be performed in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer 7 days prior to conducting tests. The Contractor shall furnish all materials, labor,

and equipment necessary to conduct field tests. The Contractor shall perform all tests and inspection recommended by the manufacturer unless specifically waived by the Contracting Officer. The Contractor shall maintain a written record of all tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. All field test reports will be signed and dated by the Contractor.

3.22.1 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

3.22.2 Ground-Resistance Tests

The resistance of each grounding electrode shall be measured using the fall-of-potential method defined in IEEE Std 81. Soil resistivity in the area of the grid shall be measured concurrently with the grid measurements. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

a. Single rod electrode - 25 ohms.

3.22.3 Omitted

3.22.4 Cable Tests

The Contractor shall be responsible for identifying all equipment and devices that could be damaged by application of the test voltage and ensuring that they have been properly disconnected prior to performing insulation resistance testing. An insulation resistance test shall be performed on all low and medium voltage cables after the cables are installed in their final configuration and prior to energization. The test voltage shall be 500 volts DC applied for one minute between each conductor and ground and between all possible combinations of conductors. The minimum value of resistance shall be:

R in megohms = (rated voltage in kV + 1) x 1000/(length of cable in feet)

Each cable failing this test shall be repaired or replaced. The repaired cable system shall then be retested until failures have been eliminated.

3.22.4.1 Omitted

3.22.4.2 Low Voltage Cable Tests

a. Continuity test.

b. Insulation resistance test.

3.22.5 Omitted
3.22.6 Omitted
3.22.7 Omitted
3.22.8 Omitted

3.22.9 Circuit Breaker Tests

The following field tests shall be performed on circuit breakers.

3.22.9.1 Omitted

3.22.9.2 Circuit Breakers, Low Voltage

a. Insulation resistance test phase-to-phase, all combinations.

b. Insulation resistance test phase-to-ground, each phase.

c. Closed breaker contact resistance test.

d. Manual and electrical operation of the breaker.

3.22.9.3 Circuit Breakers, Molded Case

a. Insulation resistance test phase-to-phase, all combinations.

b. Insulation resistance test phase-to-ground, each phase.

c. Closed breaker contact resistance test.

d. Manual operation of the breaker.

3.22.10 Omitted

3.22.11 Protective Relays

Protective relays shall be visually and mechanically inspected, adjusted, tested, and calibrated in accordance with the manufacturer's published instructions. These tests shall include pick-up, timing, contact action, restraint, and other aspects necessary to insure proper calibration and operation. Relay settings shall be implemented in accordance with the coordination study. Relay contacts shall be manually or electrically operated to verify that the proper breakers and alarms initiate. Relaying current transformers shall be field tested in accordance with IEEE C57.13.

3.23 OPERATING TESTS

After the installation is completed, and at such time as the Contracting Officer may direct, the Contractor shall conduct operating tests for approval. The equipment shall be demonstrated to operate in accordance with the specified requirements. An operating test report shall be submitted in accordance with paragraph FIELD TEST REPORTS.

3.24 FIELD SERVICE

3.24.1 Onsite Training

The Contractor shall conduct a training course for the operating staff as designated by the Contracting Officer. The training period shall consist of a total of 12 hours of normal working time and shall start after the

system is functionally completed but prior to final acceptance tests. The course instruction shall cover pertinent points involved in operating, starting, stopping, servicing the equipment, as well as all major elements of the operation and maintenance manuals. Additionally, the course instructions shall demonstrate all routine maintenance operations. A VHS format video tape of the entire training shall be submitted.

3.24.2 Installation Engineer

After delivery of the equipment, the Contractor shall furnish one or more field engineers, regularly employed by the equipment manufacturer to supervise the installation of equipment, assist in the performance of the onsite tests, oversee initial operations, and instruct personnel as to the operational and maintenance features of the equipment.

3.25 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all tests and after all defects in installation, material or operation have been corrected.

-- End of Section --