

MT. SAN ANTONIO COMMUNITY COLLEGE DISTRICT

Addendum No. 4

August 17, 2009

Design Technology Center

Bid Nos. 2844 - 2853

To All Bidders:

All bidders shall acknowledge receipt of this Addendum on the bid form.

Acknowledgement of receipt of this Addendum shall be taken as prime facie evidence that, prior to submission of this bid, the bidder was fully cognizant of all provisions of the Addendum and of all work and conditions affected thereby.

FAILURE TO ACKNOWLEDGE RECEIPT OF THIS ADDENDUM MAY BE CAUSE TO REJECT BID AS BEING NON-RESPONSIVE.

In case of conflict among Bid Documents, Contract Documents and this Addendum, this Addendum shall govern.

GENERAL INFORMATION:

Contractors are reminded that the bid openings will take place in Building 23.

SPECIFICATIONS

Item No. AD-4.1: Reference Revised Sections

- A. The following Revised Sections are hereby issued:

Section 08 71 00, Door Hardware
Section 09 90 00, Painting

Item No. AD-4.2: Reference New Sections – modify Table of Contents accordingly

- A. The following New Sections are hereby issued:

Section 01 35 43, Special Environmental Requirements (add to all 2844 - 2853)
Section 01 81 19, Construction Indoor Air Quality (add to all 2844 - 2853)
Section 01 91 13, General Commissioning Requirements (add to all 2844 - 2853)
Section 23 08 00, HVAC Systems Commissioning (add to mechanical scope 2852)
Section 26 08 01, Systems Electrical Commissioning (add to electrical scope 2853)
Section 16722, Access Control System (add to electrical scope 2853)

Item No. AD-4.3:

Reference Specifications Affected

- A. In all affected Specification Sections listed below, add the following as the last Article of PART 1:

"COORDINATION - LEED

- A. LEED Objective. It is the intent of these Documents to provide the Owner with a Project that when complete will earn LEED Credit Points and qualify for LEED Certification. Failure of contractors, sub-contractors, and material suppliers, at any tier, and employees or agents of these to cooperate in the implementation of this Objective may jeopardize the Owner's ability to certify the Project. LEED Certification is a Contract requirement of this Construction Contract.
- B. Work of this Section will affect or will contribute to attainment of LEED Pre-requisites and Credit Point requirements listed in Section 01 35 43 SPECIAL ENVIRONMENTAL REQUIREMENTS.
- C. Notwithstanding other requirements of the Contract Documents, Prime Contractor(s) shall provide affected contractors, sub-contractors, material suppliers, and all affected tiers a complete copy of the technical Sections and Division 01 Sections for LEED requirements."

SECTIONS AFFECTED:

Section 01 74 00, Waste Reduction and Recycling
Section 03 20 00, Concrete Reinforcement
Section 03 30 00, Cast-In-Place Concrete
Section 05 12 00, Structural Steel
Section 05 30 00, Metal Decking
Section 05 50 00, Metal Fabrications
Section 05 50 10, Metal Pipe Bollards
Section 05 51 00, Metal Stairs
Section 05 52 00, Handrails and Railings
Section 06 41 16, Casework
Section 07 21 00, Insulation
Section 07 21 13, Rigid Thermal Insulation
Section 07 42 13, Metal Wall Panels
Section 07 42 43, Composite Panels
Section 07 52 17, Modified Bituminous Sheet Roofing
Section 07 62 00, Sheet Metal Flashing and Trim
Section 07 92 00, Joint Sealers
Section 08 12 13, Hollow Metal Frames - Welded
Section 08 13 13, Hollow Metal Doors
Section 08 14 16, Flush Wood Doors
Section 08 33 23, Overhead Coiling Doors
Section 08 41 13, Aluminum Entrances and Storefronts
Section 08 91 00, Metal Wall Louvers
Section 09 22 16, Non-Structural Metal Studs
Section 09 22 26, Drywall Suspension System

Section 09 30 13, Ceramic Tile
Section 09 51 00, Acoustical Ceilings - Lay In
Section 09 64 30, Wood Stage Flooring
Section 09 65 13, Resilient Base
Section 09 65 14, Rubber Sheet Flooring - Stairs
Section 09 65 19, Resilient Tile Flooring
Section 09 65 20, Rubber Tile Flooring
Section 09 65 50, Rubber Resilient Flooring
Section 09 72 17, Fiberglass Reinforced Plastic Panels
Section 09 84 10, Acoustical Wall Treatment

Item No. AD-4.4: Reference Section 01 74 00, Waste Reduction and Recycling

- A. Delete Paragraph 1.1.A in its entirety. Substitute therefore:
- “A. Section includes administrative and procedural requirements for the following:
1. Salvaging nonhazardous demolition and construction waste.
 2. Recycling nonhazardous demolition and construction waste.
 3. Disposing of nonhazardous demolition and construction waste.”
- B. Delete Paragraph 1.4.A in its entirety. Substitute therefore:
- “A. Waste Management Plan: Submit plan within 7 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use attached Waste Disposal and Diversion Reporting form.
- C. Waste Reduction Calculations: Before request for Final Payment submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. LEED Submittal: LEED letter template for Credit MR 2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.”
- C. Add the following new Article:
- “1.5 QUALITY ASSURANCE
- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
 - B. Waste Management Conference: Conduct conference at Project Site to comply with requirements in Division 01 Section “Project

Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of waste management coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade."

D. In Paragraph 3.1.A, delete the words: "When reasonably feasible,".

E. Delete Paragraph 3.1.C. Substitute therefore:

"C. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials."

F. Add the following new Articles:

"3.2 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be recycled or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 1. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 2. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 3. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 4. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including

- sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
1. Total quantity of waste.
 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
 3. Total cost of disposal (with no waste management).
 4. Revenue from salvaged materials.
 5. Revenue from recycled materials.
 6. Savings in hauling and tipping fees by donating materials.
 7. Savings in hauling and tipping fees that are avoided.
 8. Handling and transportation costs. Include cost of collection containers for each type of waste.
 9. Net additional cost or net savings from waste management plan.

3.3 SALVAGING DEMOLITION WASTE

- A. Except items identified for return to Owner, salvageable items shall become property of the Contractor and any revenue from sale shall accrue to Contractor.
- B. Salvaged Items for Sale Not permitted on Project site. Contractor shall remove salvaged items from site as expeditiously as feasible.
- C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handling as follows:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- F. Plumbing Fixtures: Separate by type and size.
- G. Lighting Fixtures: Separate lamps by type and protect from breakage.
- H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters panelboards, circuit breakers, and other devices by type.

3.4 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.

- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.
- E. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- F. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
 - a. Comply with requirements in Division 32 Section "Plants." for use of clean sawdust as organic mulch.
- G. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
 - a. Comply with requirements in Division 32 Section "Plants." for use of clean ground gypsum board as inorganic soil amendment.

3.5 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.
- E. Disposal: Remove waste materials from Owner's property and legally dispose of them."

Item No. AD-4.5: Reference Section 03 32 00, Concrete Reinforcement

- A. Add the following new paragraph:

"1.03.B. Special Environmental Requirements: Submit the following in accordance with the requirements of Section 01 35 43:
 1. Recycled Content."
- B. Add Subparagraph 2.01.A.4 as follows:

"4. Minimum Recycled Content:
 - a. Total: 90 percent.
 - b. Post-Consumer: 55 percent."

Item No. AD-4.6: Reference Section 03 30 00, Cast-In-Place Concrete

- A. Add the following new paragraph:

"1.03.E. Special Environmental Requirements: Submit the following in accordance with the requirements of Section 01 35 43:
 1. Recycled Content."
- B. Paragraph 2.01.E, Delete the words" may be used at 15% maximum replacement" to read: "shall be used at 25% replacement."

Item No. AD-4.7: Reference Section 05 12 00, Structural Steel

A. Add the following new paragraphs:

- "1.03.H. Special Environmental Requirements: Submit the following in accordance with the requirements of Section 01 35 43:
1. Recycled Content."
- "2.01.L. Minimum Recycled Content:
1. Total: 90 percent.
 2. Post-Consumer: 55 percent."

Item No. AD-4.8: Reference Section 05 30 00, Metal Decking

A. Add the following new paragraphs:

- "1.03.B. Special Environmental Requirements: Submit the following in accordance with the requirements of Section 01 35 43:
1. Recycled Content."
- " 2.02.I. Steel Minimum Recycled Content: 30 percent total / 5 percent post-consumer."

Item No. AD-4.9: Reference Section 05 50 00, Metal Fabrications

A. Add the following new paragraphs:

- "1.03.E. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all metal fabrications:
1. Recycled Content, LEED Credits MR 4.1 and 4.2."
- "2.02.I. Steel Minimum Recycled Content: 90-percent total / 55% post-consumer."
- "2.03.G. "Aluminum Minimum 45-percent post-consumer recycled content."

Item No. AD-4.10: Reference Section 05 50 10, Metal Pipe Bollards

A. Add the following new paragraphs:

- "1.03.B. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all metal fabrications: .
1. Recycled Content, LEED Credits MR 4.1 and 4.2.
- "2.02.A.2 Steel Minimum Recycled Content: 90-percent total / 55% post-consumer."

Item No. AD-4.11: Reference Section 05 51 00, Metal Stairs

A. Add the following new paragraphs:

"1.04.B. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all metal fabrications:

1. Recycled Content, LEED Credits MR 4.1 and 4.2.

"2.02.M. Steel Minimum Recycled Content: 90-percent total / 55% post-consumer."

Item No. AD-4.12: Reference Section 05 52 00, Handrails and Railings

A. Add the following new paragraphs:

"1.05.E. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all metal fabrications:

1. Recycled Content, LEED Credits MR 4.1 and 4.2.

"2.01.H. Steel Minimum Recycled Content: 90-percent total / 55% post-consumer."

Item No. AD-4.13: Reference Section 06 20 00, Finish Carpentry - Installation of Doors

A. Add the following new Articles:

"1.04 SUBMITTALS

A. Submit Special Environmental Product Submittal Form, found in Appendix A of Section 01 35 43, Special Environmental Requirements.

1. Provide the following information for all wood products:
 - a. Certified Wood, LEED Credit MR7 (if used)
2. Provide the following information for all plywood:
 - a. Low Emitting, Credit 4.4
 - b. Certified Wood, Credit MR 7 (if used)

1.05 QUALITY ASSURANCE

A. All Plywood shall be free of urea-formaldehyde binders and adhesives."

Item No. AD-4.14: Reference Section 06 41 16, Casework

A. In Article 1.02, add the following new Paragraph:

"K. BAAQMD -- Bay Area Air Quality Management District Regulation 8, Rule 51

Adhesive and Sealant Products.”

B. In Article 1.03, add the following new Paragraph:

“F. LEED Submittals:

1. Product Data for Credit EQ 4.1: For installation adhesives, including printed statement of VOC content.
2. Product Data for Credit EQ 4.4:
 - a. For each composite-wood product used, documentation indicating that the bonding agent contains no urea formaldehyde.
 - b. For each adhesive used, documentation indicating that the adhesive contains no urea formaldehyde.
3. Product Data for Credit(s) MR 4.1 and MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content
 - a. Include statement indicating costs for each product having recycled content.
4. Certificates for Credit MR 7: Chain-of-custody certificates certifying that products specified to be made from certified wood comply with forest certification requirements. Include evidence that mill is certified for chain of custody by an FSC-accredited certification body.
 - a. Include statement indicating costs for each certified wood product.”

C. In Article 2.02, add the following new Paragraph:

- “B. Products of the following sheet materials manufacturers from the basis for design and quality intended.
1. Sierra Pine, Medford, OR.
 2. Columbia Forest Products, Klamath Falls, OR.
 3. Roseburg Forest Products, Roseburg, OR.
 4. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.”

D. In Article 2.05, add the following new Paragraph:

“B. Wood materials shall be FSC Certified.”

E. In Subparagraph 2.06.A.1, add the following new Subparagraphs:

- a. Particle board shall be composed of 100% recycled wood fiber.
- b. No added urea formaldehyde permitted.
- c. FSC certified.”

F. In Subparagraph 2.07.A.1, at the end of the sentence add the following: “and BAAQMD Regulation 8, Rule 51.”

Item No. AD-4.15:

Reference Section 07 21 00, Insulation

A. Add the following new paragraphs:

- "1.02.G. BAAQMD - Bay Area Air Quality Management District Regulation 8, Rule 51 Adhesive and Sealant Products.
- 1.04.D. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all fiberglass batt products:
1. Recycled Content.
- 1.04.E. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all adhesives applied in the Section:
1. Low-Emitting Materials."

B. Modify Paragraph 1.05.B as follows:

- "B. Adhesives shall comply with VOC content limits defined by SCAQMD Rule 1168 and BAAQMD Regulation 8, Rule 51."

C. Revise Paragraph 2.02.A. to read as follows:

- "2.02.A. Batt Insulation: ASTM C665, Type III, Class A, Category 1. Preformed, faced, formaldehyde-free glass fiber batt insulation, with tabs, conforming to following:
1. Thermal Resistance R-values as noted in energy calculation or prescriptive compliance documents.
 2. Batt Size As required to fully fill cavity width and height or length.
 3. Thickness As required to meet specified R-value without compression.
 4. Facing Faced on one side with flame resistant foil facing.
 5. Flame Spread Less than 25, ASTM E 84
 6. Smoke Developed Rating Maximum 50, ASTM E 84
 7. Permeance 0.05 perms, ASTM E 96
 8. Recycled Content Minimum 25 percent"

D. Paragraph 2.03.A., Add the following:

- "7. Recycled Content: Minimum 25 percent."

Item No. AD-4.16: Reference Section 07 21 13, Rigid Thermal Insulation

A. Add the following new paragraphs:

- "1.02.E. BAAQMD - Bay Area Air Quality Management District Regulation 8, Rule 51 Adhesive and Sealant Products."
- "1.04.D. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 special Environmental Requirements. Provide the following information for all rigid thermal insulation:
1. Recycled Content."
- "1.04.E. Special Environmental Requirements Product Submittal form, found in Appendix A of Section 01 35 43 Special environmental Requirements. Provide the following information for all adhesives applied in this Section:
1. Low-Emitting Materials."
- B. In Paragraph 2.02.A., Add the following:
"7. Recycled Content: Minimum 25 percent."
- C. In Paragraph 2.03.D., Add the following:
"1. Adhesives shall comply with VOC content limits defined by SCAQMD Rule 1168 and BAAQMD Regulation 8, Rule 51."

Item No. AD-4.17: Reference Section 07 42 13, Metal Wall Panels

- A. Add the following new paragraphs:
- "1.04.D. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 special Environmental Requirements. Provide the following information for all rigid thermal insulation:
1. Recycled Content.
- 2.02.A.6 Aluminum Minimum 45-percent post-consumer recycled content."

Item No. AD-4.18: Reference Section 07 42 43, Composite Panels

- A. Add the following new paragraphs:
- "1.05.F. Special Environmental Requirements: Submit information regarding recycled content for all composite panels. Use the Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements.
- 2.02.A.1 Aluminum Minimum 45-percent post-consumer recycled content."

Item No. AD-4.19: Reference Section 07 52 17, Modified Bituminous Sheet Roofing

- A. In Article 1.03 add the following new Subparagraph:

"G. Sustainability Standards Certification: Solar Reflectance Index (SRI) not less than 78 when tested in accordance with ASTM E 1980."

B. In Article 1.04, add the following new Subparagraph:

"J. LEED Submittals:

1. Product Test Reports for Credit SS 7.2: For roof materials, indicating that roof materials comply with Solar Reflectance Index requirement.
2. Product Data for Credit EQ 4.1: For adhesives and sealants, including printed statement of VOC content."

C. In Paragraph 2.01.E, change product from "Paradiene FR" to "Paradiene CRFR".

Item No. AD-4.20: Reference Section 07 62 00, Sheet Metal Flashing and Trim

A. Add the following new paragraphs:

- "1.03.E. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all sheet metal flashings and trim:
1. Recycled Materials."
- 2.01.A.1. Steel Minimum Recycled content: 30 percent total / 5 percent post consumer.
- 2.01.B.1 Aluminum Minimum 45-percent post-consumer recycled content."

Item No. AD-4.21: Reference Section 07 92 00, Joint Sealers

A. Add the following new paragraph:

- "1.03.C. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all joint sealers exposed to the interior side of the building envelope:
1. Low-Emitting Materials."

Item No. AD-4.22: Reference Section 08 12 13, Hollow Metal Frames - Welded

A. Add the following new paragraphs:

- "1.03.E. Special Environmental Requirements: Submit the following in accordance with the requirements of Section 01 35 43:
1. Recycled Content.
- 2.02.A.3. Steel Minimum Recycled content: 30 percent total / 5 percent post consumer."

Item No. AD-4.23: Reference Section 08 13 13, Hollow Metal Doors

A. Add the following new paragraphs:

"1.03.D. Special Environmental Requirements: Submit the following in accordance with the requirements of Section 01 35 43:
1. Recycled Content.

2.01.A.1. Steel Minimum Recycled content: 30 percent total / 5 percent post consumer."

Item No. AD-4.24: Reference Section 08 14 16, Flush Wood Doors

A. Add the following new paragraph:

"1.03.F. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for all particleboard core doors:
1. Recycled Content Credit MR4.1.
2. Low-Emitting Material Credit EQ4.4."

Item No. AD-4.25: Reference Section 08 33 23, Overhead Coiling Doors

A. Add the following new paragraph:

"1.05.F. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for overhead coiling doors:
1. Recycled Content."

2.02.K Steel Minimum Recycled content: 30 percent total / 5 percent post consumer."

Item No. AD-4.26: Reference Section 08 41 13, Aluminum Entrances and Storefronts

A. Add the following new paragraph:

"1.04.F. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for all aluminum materials:
1. Recycled Content."

B. In Paragraph 2.02.A, Add the following:

"1. Minimum 45 percent post-consumer recycled content."

Item No. AD-4.27: Reference Section 08 44 14, Glazed Aluminum Curtain Wall

A. Add the following new paragraph:

- "1.05.H. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for all glazed aluminum curtain walls:
1. Recycled Content."

B. In Paragraphs 2.02.A and 2.02.B, Add the following:

- "1. Minimum 45 percent post-consumer recycled content."

Item No. AD-4.28: Reference Section 08 91 00, Metal Wall Louvers

A. Add the following new paragraphs:

- "1.04.E. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for all metal wall louvers:
1. Recycled Content."

- "2.02.G. Aluminum materials shall have a minimum post-consumer recycled content of 45 percent."

Item No. AD-4.29: Reference Section 09 22 16, Non-Structural Metal Studs

A. Add the following new paragraphs:

- "1.03.C. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for all non-structural metal studs:
1. Recycled Content."

- 2.01.O Steel Minimum Recycled content: 30 percent total / 5 percent post consumer."

Item No. AD-4.30: Reference Section 09 22 26, Drywall Suspension System

A. Add the following new paragraphs:

- "1.04.E. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for all drywall suspension systems:
1. Recycled Content."

- 2.02.K Steel Minimum Recycled content: 30 percent total / 5 percent post consumer."

Item No. AD-4.31: Reference Section 09 30 13, Ceramic Tile

A. In Paragraph 1.04.F., Modify as follows:

- "F. Tile Adhesives and Joint Sealers: As recommended by the tile manufacturer. Comply with VOC Limits set by SCAQMD Rule 1168 and

BAAQMD Regulation 8, Rule 51."

B. Add the following new paragraphs:

"1.02.U. BAAQMD - Bay Area Air Quality Management District Regulation 8, Rule 51 Adhesive and Sealant Products."

"1.03.F. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all adhesives and joint sealers:

1. Low-Emitting Materials."

Item No. AD-4.32: Reference Section 09 51 00, Acoustical Ceilings - Lay-In

A. Add the following new paragraph:

"1.03.D. Special Environmental Product Submittal Form, found in Appendix A of 01 35 43, Special Environmental Requirements. Provide the following information for all drywall suspension systems:

1. Recycled Content."

B. Add the following new Sup-Paragraph:

"2.02.A.8. Minimum Recycled Content: 45% post-industrial / 4% post-consumer (49% total)."

Item No. AD-4.33: Reference Section 09 64 30, Wood Stage Flooring

A. In Article 1.03, add the following new Paragraph:

"G. LEED Submittals:

1. Product Data for Credit EQ 4.1: For installation adhesives, including printed statement of VOC content.
2. Product Data for Credit EQ4.4:
 - a. For each composite-wood product used, documentation indicating that the bonding agent contains no urea formaldehyde.
 - b. For each adhesive used, documentation indicating that the adhesive contains no urea formaldehyde.
3. Certificates for Credit MR 7: Chain-of-custody certificates certifying that products specified to be made from certified wood comply with forest certification requirements. Include evidence that mill is certified for chain of custody by an FSC-accredited certification body.
 - a. Include statement indicating costs for each certified wood product."

B. In Paragraph 2.02.A, add the following new Subparagraph:

"1. No added urea-formaldehyde."

- C. In Paragraph 2.02.B, add the following new Subparagraph:
- "1. FSC Certified."
- D. In Paragraph 2.02.C, add the following new Subparagraph:
- "1. FSC Certified."
- E. In Paragraph 2.03.D, add the following new Subparagraph:
- "1. Adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168 and BAAQMD Regulation 8, Rule 51."

Item No. AD-4.34: Reference Section 09 65 13, Resilient Base

- A. Add the following new paragraph:
- "1.04.E. Special Environmental Requirements: Submit information regarding low-emitting materials for adhesive applied on work site. Use the "Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements."

Item No. AD-4.35: Reference Section 09 65 14, Rubber Sheet Flooring - Stairs

- A. Add the following new paragraph:
- "1.04.E. Special Environmental Requirements: Submit information regarding low-emitting materials for adhesive applied on work site. Use the "Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements."
- B. In Paragraph 2.05.B, Add the following:
- "1. Non-aerosol adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168. Aerosol adhesives shall comply with VOC contents limits by Green Seal Standard GS-36."

Item No. AD-4.36: Reference Section 09 65 19, Resilient Tile Flooring

- A. Add the following new paragraph:
- "1.04.F. Special Environmental Requirements: Submit information regarding low-emitting materials for adhesive applied on work site. Use the "Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements."

Item No. AD-4.37: Reference Section 09 65 20, Rubber Tile Flooring

A. Add the following new paragraph:

"1.03.E. Special Environmental Requirements: Submit information regarding low-emitting materials for adhesive applied on work site. Use the "Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements."

B. In Paragraph 2.04.B, Add the following:

"1. Non-aerosol adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168. Aerosol adhesives shall comply with VOC contents limits by Green Seal Standard GS-36."

Item No. AD-4.38: Reference Section 09 65 50, Rubber Resilient Flooring

A. Add the following new paragraph:

"1.03.C. Special Environmental Requirements: Submit information regarding low-emitting materials for adhesive applied on work site. Use the "Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements."

B. Add the following new Article:

"2.05 ADHESIVES

A. Non-aerosol adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168. Aerosol adhesives shall comply with VOC contents limits by Green Seal Standard GS-36."

Item No. AD-4.39: Reference Section 09 68 16, Sheet Carpeting

A. In Paragraph 1.04.E, Modify as follows:

"E. Adhesives shall comply with VOC content limits defined by SCAQMD Rule 1168 and BAAQMD Regulation 8, Rule 51."

B. Add the following new paragraphs:

"1.02.I. BAAQMD - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products."

"1.03.E. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all sheet carpet materials:

1. Recycled Content.
2. Low-Emitting Materials."

- "1.03.F. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all sheet carpet adhesives:
1. Low-Emitting Materials."
- "1.04.F. All carpet products shall meet or surpass all criteria of the Green Label Plus Indoor Air Quality Test Program established by the Carpet and Rug Institute (CRI) of Dalton, Georgia."

Item No. AD-4.40: Reference Section 09 72 17, Fiberglass Reinforced Plastic Panels

- A. Add the following new paragraph:
- "1.03.I. Special Environmental Requirements: Submit information regarding low-emitting materials for adhesive applied on work site. Use the "Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements."
- B. In Paragraph 2.03.A, Add the following:
- "1. Non-aerosol adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168. Aerosol adhesives shall comply with VOC contents limits by Green Seal Standard GS-36."

Item No. AD-4.41: Reference Section 09 84 10, Acoustical Wall Treatment

- A. Add the following new paragraph:
- "1.04.D. Special Environmental Requirements: Submit information regarding low-emitting materials for adhesive applied on work site. Use the "Special Environmental Product Documentation Submittal Form", Appendix A, Section 01 35 43, Special Environmental Requirements."
- B. In Paragraph 2.03.A, Add the following:
- "1. Non-aerosol adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168. Aerosol adhesives shall comply with VOC contents limits by Green Seal Standard GS-36."

Item No. AD-4.42: Reference New Drawings

- A. The following New Drawings are hereby issued:
- AD-4.01 through AD-4.05
AD-4.07 through AD-4.16

Item No. AD-4.43: Reference Revised Drawings

- A. The following Revised Drawing is hereby issued:

AD-4.06

Item No. AD-4.44: Reference Drawing E0.2, Electrical Symbol List

- A. Recessed combination power/data floor box part number shall be #FL500P-6."

RESPONSE TO RFI'S

Item No. 01: **ISEC**

RFI #B024 dated 07/31/09

Reference Spec Section 2849-01 11 00

Q: Bid package #2849 01100 1.3.A.12 states "furnish and install access control, including power assisted/automatic doors operator, devices to all exterior doors." There are 30 exterior doors. Please clarify which doors are to receive auto operators and what model electrified hardware should be used with the operators, such as electrified panics, hinges, and locksets. If access control is required, please provide an access control specification.

A: "Access Controls" and "Automatic Door Opener" specifications will be addressed in Addendum No. 4.

Item No. 02: **JM Farnan Company**

RFI #B035 dated 08/05/09

Reference Sheet C-4.0

Q: Reference Addendum No. 2, Item No. 63. Please clarify how and where the perforated drainpipe at the site retaining walls is to connect to the storm drain shown on Sheet C-4.0. Also, please provide the specific elevations indicated on Construction Note 15 on Sheet C-4.0.

A: Perforated drainpipe shall daylight thru retaining wall as indicated on 25/S0.2. Location of daylighted pipes shall be determined during construction. No connection to storm-drain system shall be required.

Item No. 03: **ISEC**

RFI #B036 dated 08/06/09

Reference Spec Section 26 07 50, 2.13A

Q: Bid Package 2849 001100 1.3.A.12 states "Furnish and install access control, including power assisted/automatic doors operator, devices to all exterior doors". Addendum No 2 Item #72 call out the Auto Operator Locations, the last opening listed 319B does not exist. Please clarify

Addendum No. 2 Ad 2.17 Symbol CR1 says verify exact location with Architect. AD2.18 - AD2.22 show card readers at every opening. This would not be practical. If access control is required, please provide opening number and an access control specification, including what model electrified hardware should be used with the access control card readers, such as electrified panics, hinges and locksets.

A: "Access Controls" and "Automatic Door Opener" specifications will be addressed in Addendum No. 4.

Item No. 04: **Sunwest Data/Telecom**
RFI #B067 dated 08/06/09

Q: In Addendum 2, Item 61, you are saying classroom, computer labs and meeting rooms are complete system while the drawings provided states that the AV system is Owner-Provided and Owner Installed except for the rough-in boxes and ceiling mounted speakers. Please clarify as to where instructed in contract documents.

A: This issue will be addressed in Addendum No. 4.

Item No. 05: **Daniels Electric**
RFI #B073 dated 08/06/09

Q: Electrical Bid No. 01100 - 1.3-A 9 directs us to furnish and install AV equipment and related per AV drawings including Group 1 items in assembly. Addenda 2 #61 and 70 tell us to refer to 5/E-3.0. Detail 5/E-3.0 says items (except speaker backboxes) are OFOI - Refers to info on AV drawings that are MIA.

A: This issue will be addressed in Addendum No. 4.

END OF ADDENDUM

SECTION 01 35 43

SPECIAL ENVIRONMENTAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Special construction practices related to energy conservation and efficiency, indoor air quality, and environmentally sustainable resource consumption.
2. Owner is committed to sustainable design as defined by the US Green Building Council's LEED Rating System.
3. Construction team is required to comply with sustainable building practices described in this Section and subsequent sections, during construction and when considering materials for substitutions. Make subcontractors, sub-subcontractors, material suppliers and their employees and agents at any tier, familiar with these goals.

B. Related Sections

1. Section 01 74 00, Waste Reduction and Recycling
2. Section 01 81 19, Construction Indoor Air Quality
3. Section 01 91 13, General Commissioning Requirements

C. LEED Objective. This project is registered under LEED for New Construction, version 2.2. It is the intent of these Documents to provide the Owner with a Project that when complete, will qualify for LEED-NC v2.2 Certification. Failure of contractors, sub-contractors, and material suppliers, at any tier, and employees or agents of these to cooperate in the implementation of this Objective may jeopardize the Owner's ability to certify the Project. Project design anticipates attainment of the following LEED Prerequisites and points. A "P" denotes a LEED credit prerequisite.

1.	SSp1	Construction Activity Pollution Prevention	P
2.	SSc1	Site Selection	1
3.	SSc2	Development Density & Community Connectivity	1
4.	SSc3	Brownfield Redevelopment	1
5.	SSc4.1	Alternative Transportation, Public Transportation	1
6.	SSc4.4	Alternative Transportation, Parking Capacity	1
7.	SSc7.1	Heat Island Effect, Non-Roof	1
8.	SSc7.2	Heat Island Effect, Roof	1
9.	SSc8	Light Pollution Reduction	1
10.	WEc1.1	Water Efficient Landscaping, Reduce 50%	1
11.	WEc3.1	Water Use Reduction, 20% Reduction	1
12.	EAp1	Fundamental Commissioning	P
13.	EAp2	Minimum Energy Performance	P
14.	EAp3	Fundamental Refrigerant Management	P
15.	EAc1.4	Optimize Energy Performance	4

16.	MRp1	Storage and Collection of Recyclables	P
17.	MRc2.1	Construction Waste Management, Divert 50%	1
18.	MRc2.2	Construction Waste Management, Divert 75%	1
19.	MRc4.1	Recycled Content, 10%	1
20.	MRc7	Certified Wood, 50% FSC	1
21.	EQp1	Minimum IAQ Performance	P
22.	EQp2	Tobacco Smoke Control	P
23.	EQc1	Outdoor Air Delivery Monitoring	1
24.	EQc3.1	Construction IAQ Management Plan, During Construction	1
25.	EQc3.2	Construction IAQ Management Plan, Before Occupancy	1
26.	EQc4.1	Low Emitting Materials, Adhesives and Sealants	1
27.	EQc4.2	Low Emitting Materials, Paints and Coatings	1
28.	EQc4.3	Low Emitting Materials, Carpet Systems	1
29.	EQc4.4	Low Emitting Materials, Composite Woods	1
30.	EQc5	Indoor Chemical & Pollutant Source Control	1
31.	EQc6.1	Controllability of Systems, Lighting	1
32.	EQc6.2	Controllability of Systems, Thermal Comfort	1
33.	EQc7.1	Thermal Comfort, Design	1
34.	EQc7.2	Thermal Comfort, Verification	1
35.	ID-1.1	Innovation in Design	
	thru 1.4		4
36.	IDc2	<u>LEED Accredited Professional</u>	<u>1</u>
37.		Anticipated Point Total	35

1.02 DEFINITIONS

- A. Recycled Content: feedstock materials that have been recovered from consumer or industrial waste streams. Recycled content is classified into two types:
 - 1. Post-Consumer Recycled Content is material content derived from waste generated by households or by commercial, industrial and institutional facilities in their role as end-users, who have discarded the material as no longer suitable for its intended purpose.
 - 2. Pre-Consumer Recycled Content is material content derived from the waste and surplus material stream of a manufacturing or fabrication process; excluding reuse of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.
- B. Low-Emitting Materials: building materials that comply with specified VOC emissions requirements.
- C. Certified Wood: wood-based products that are certified as sustainably harvested from ecologically managed forests under the Forest Stewardship Council's (FSC) Principles and Criteria.

1.03 SUBMITTALS

- A. Submit the following information, including manufacturer's certifications or verifying information where Specifications sections require submittals relating to environmental issues. Use the Submittal Form, attached as Appendix A to this Section, for all submittals below. Provide 3-copies of the submittal form, along with all supporting documentation.
1. Recycled Content: Submit information regarding product post industrial recycled and post consumer recycled content.
 - a. Identify the percentage by weight of virgin content, post-industrial recycled content, and post-consumer recycled content. Attach either a third-party certification or a letter signed by a corporate officer of the product manufacturer attesting to the recycled content. Certification or letter is not required for steel products.
 - b. Demonstrate that post-industrial and post-consumer recycled content of materials installed meet or exceeds that required by product specifications.
 - c. For steel products where specific recycled content information is not available, simply indicate whether the steel was produced using Basic Oxygen Furnace or Electric Arc Furnace method. Recycled content will be determined by industry averages for the corresponding production method.
 - d. The following Specification Sections contain Recycled Content submittal requirements:
 - Section 01 74 00, Waste Reduction and Recycling
 - Section 03 20 00, Concrete Reinforcement
 - Section 03 30 00, Cast-In-Place Concrete
 - Section 05 12 00, Structural Steel
 - Section 05 30 00, Metal Decking
 - Section 05 50 00, Metal Fabrications
 - Section 05 50 10, Metal Pipe Bollards
 - Section 05 51 00, Metal Stairs
 - Section 05 52 00, Handrails and Railings
 - Section 06 41 16, Casework
 - Section 07 21 00, Insulation
 - Section 07 21 13, Rigid Thermal Insulation
 - Section 07 42 43, Composite Panels
 - Section 07 52 17, Modified Bituminous Sheet Roofing
 - Section 07 62 00, Sheet Metal Flashing and Trim
 - Section 08 12 13, Hollow Metal Frames - Welded
 - Section 08 13 13, Hollow Metal Doors
 - Section 08 14 16, Flush Wood Doors
 - Section 08 33 23, Overhead Coiling Doors
 - Section 08 41 13, Aluminum Entrances and Storefronts
 - Section 08 44 14, Glazed Aluminum Curtain Wall
 - Section 08 91 00, Metal Wall Louvers
 - Section 09 22 16, Non-Structural Metal Studs

Section 09 22 26, Drywall Suspension System

Section 09 51 00, Acoustical Ceilings - Lay In

Section 09 68 16, Sheet Carpeting

2. Certified Wood. For all products designated in their respective sections as containing "FSC certified" wood content, quantify and provide evidence of compliance with FSC standards as follows.
 - a. Identify the percentage by weight of FSC certified wood content.
 - b. Demonstrate that products are FSC certified by providing an FSC chain-of-custody number. This number is typically contained on vendor's invoices. A "vendor" is defined as the company that furnishes wood products to project contractors and/or sub-contractors for on-site installation.
 - c. Non-FSC certifications (such as Sustainable Forestry Initiative [SFI]) will not be accepted.
 - d. The following Specification Sections contain FSC wood submittal requirements:

Section 06 20 00, Finish Carpentry - Installation of Doors
3. Indoor Air Quality (IAQ). Submit verification that the following products comply with respective IAQ requirements.
 - a. Adhesives and Sealants: conform to maximum VOC content limits set by South Coast Air Quality Management District Rule #1168 and conform to Bay Area Air Quality Management District Regulation 8, Rule 51. Attach MSDS sheet or attestation letter from the manufacturer for all adhesives and sealants used.
 - b. Interior Paints and Coatings (opaque topcoat only). Conform to maximum VOC content limits set by Green Seal Standard GS-11. Attach a copy of Green Seal certification, MSDS sheet, or attestation letter from the manufacturer for all opaque topcoat interior paints and coatings used.
 - c. Composite Wood and Agrifiber Products: free of added urea-formaldehyde resins. Attach MSDS sheet or attestation letter from the manufacturer for all composite wood and Agrifiber products used.
 - d. Low-Emitting Materials: The following Specification Sections contain Low-Emitting submittal requirements:

Section 06 20 00, Finish Carpentry - Installation of Doors
Section 06 41 16, Casework
Section 07 92 00, Joint Sealers
Section 09 30 13, Ceramic Tile
Section 09 51 00, Acoustical Ceilings
Section 09 65 13, Resilient Base
Section 09 65 19, Resilient Tile Flooring
Section 09 68 16, Sheet Carpeting

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

APPENDIX A

SPECIAL ENVIRONMENTAL PRODUCT DOCUMENTATION SUBMITTAL FORM

Product: _____

Spec Section: _____

Date: _____

Quantity Bid: _____

Unit of Measure: _____

Cost of Material: _____

Weight in Pounds: _____

The General Contractor must return this form, along with required attachments, completed for each special environmental product as required by specific specification sections. Attach additional sheets if necessary. Check specific product requirements below as required by specification sections.

PROJECT: Mt. SAC Design Technology Center _____ OWNER: Mt. SAC _____

Address: 1100 N. Grand Ave. Walnut, CA 91789

GENERAL CONTRACTOR

Name: _____

Address: _____

Telephone, fax, email: _____

SUBCONTRACTOR / INSTALLER

Name: _____

Address: _____

Telephone, fax, email: _____

PRODUCT MANUFACTURER / VENDOR

Name: _____

Address: _____

Telephone, fax, email: _____

PRODUCT REQUIREMENTS:

☐ RECYCLED CONTENT (NON-STEEL MATERIALS)

% virgin content:	% pre-consumer content:	% post-consumer content:	Total:
			100 %

All percentages are by weight. Attach attestation letter signed by a corporate officer of the product manufacturer or third party certification documentation.

☐ **RECYCLED CONTENT (STEEL MATERIALS)**

Indicate production method of steel:

☐ **Basic Oxygen Furnace**

☐ **Electric Arc Furnace**

Attach attestation letter signed by a corporate officer of the product manufacturer or third party certification documentation.

☐ **CERTIFIED WOOD**

% FSC certified wood:

Percentage by weight. Attach FSC chain-of-custody certification number.

☐ **LOW-EMITTING MATERIALS**

- ☐ Adhesives and sealants conform to maximum VOC content limits set by South Coast Air Quality Management District Rule #1168 and all sealants and sealant primers conform to Bay Area Air Quality Management District Regulation 8, Rule 51. Attach MSDS sheet or attestation letter from the manufacturer for all adhesives and sealants used.
- ☐ Opaque topcoat interior paints and coatings conform to maximum VOC content limits set by Green Seal Standard GS-11. Attach a copy of Green Seal certification, MSDS sheet, or attestation letter from the manufacturer for all opaque topcoat interior paints and coatings used.
- ☐ Carpet systems (carpet, cushion, and adhesives) conform to the maximum VOC content limits set by the Carpet and Rug Institute Green Label Testing Program. Attach a copy of CRI Green Label certification, MSDS sheet, or attestation letter from the manufacturer for all carpet systems used.
- ☐ Composite wood and agrifiber products are free of added urea-formaldehyde resins. Attach MSDS sheet or attestation letter from the manufacturer for all composite wood and Agrifiber products used.

END OF FORM

SECTION 01 81 19

CONSTRUCTION INDOOR AIR QUALITY

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Temporary construction ventilation, dust protection, preconditioning of materials, protection of materials, sequencing, duct protection, and duct cleaning to insure good indoor air quality after occupancy to be performed by the CONTRACTOR.

1.02 REFERENCES

- A. SMACNA – IAQ Guidelines for Occupied Buildings Under Construction, 1995, Chapter 3.
- B. ASHRAE Standard 52.2-1999 – Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size (ANSI approved)

1.03 RELATED SECTIONS

- A. Section 01 35 43, Special Environmental Requirements
- B. Section 01 60 00, Product Requirements
- C. Section 01 77 00, Project Closeout

1.04 CLASSIFICATION OF RELEVANT MATERIALS

A. VOC-EMITTING MATERIALS

- 1. Section 06 20 00 Finish Carpentry – Installation of Doors
 - a. Composite wood products containing added urea-formaldehyde
- 2. Section 06 41 16 Casework
 - a. Adhesives applied on-site
 - b. Composite wood products containing added urea-formaldehyde
- 3. Section 07 21 00 Insulation
 - a. Batt insulation, unless formaldehyde-free
 - b. Adhesives applied on-site
- 4. Section 07 84 00 Firestopping
 - a. All sealants, caulking, or spray materials.
- 5. Section 07 92 00 Joint Sealers
 - a. All joint sealers applied on-site on the interior side of the building envelope.
- 6. Section 09 65 13 Resilient Base
 - a. Adhesives
- 7. Section 09 65 50 Rubber Resilient Flooring
 - a. Adhesives

8. Section 09 65 14 Rubber Sheet Flooring - Stairs
 - a. Adhesives
9. Section 09 65 19 Resilient Tile Flooring
 - a. Adhesives
10. Section 09 65 20 Rubber Tile Flooring
 - a. Adhesives
11. Section 09 68 16 Sheet Carpeting
 - a. Adhesives
12. Section 09 84 10 Acoustical Wall Treatment
 - a. Adhesives
13. Section 09 90 00 Painting

B. VOC-EMITTING FURNISHINGS AND EQUIPMENT – not in contract

C. POROUS AND FIBROUS MATERIALS

1. Section 07 21 00 Insulation
 - a. Batt insulation (exposed to interior only)
2. Section 09 51 00 Acoustical Ceilings – Lay-In

1.05 SUBMITTALS

- A. Contractor shall develop and submit to the Architect for review the Construction Indoor Air Quality (IAQ) Plan as required in this Specification. A template form is provided as Appendix A of this Specification. The plan shall be submitted along with the first submittal for any of the products listed above.

1.06 SUBSTITUTIONS

- A. Construction Indoor Air Quality (IAQ) requirements described below are based upon practices described in *SMACNA IAQ Guidelines for Occupied Buildings Under Construction*, 1995. Any modifications to or substitutions of requirements described in this Section must comply with the abovementioned SMACNA guideline.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.01 QUALITY ASSURANCE

- A. Inspection: Contractor shall conduct inspections to confirm that construction IAQ measures proposed in the Construction IAQ Plan are being followed, and be prepared to report compliance with the Plan at progress meetings.

PROJECT CONDITIONS

- A. Air Filtration:
1. Systems designed with particle filters shall not be operated without filters in place. Temporary construction filters shall have a minimum MERV rating of 6.
 2. Replace all air filtration media immediately prior to occupancy. Post-construction air filters shall have a minimum MERV rating of 13.
- B. Construction Ventilation: Following building enclosure, maintain continuous temporary ventilation of areas during installation of VOC-Emitting Materials identified in paragraph 1.04 of this Specification. Construction Ventilation shall be provided for post-occupancy touch-up work involving VOC-Emitting materials. It is not required during Building Flush-Out.
1. Ventilation shall be supplied via open windows and doors, temporary ducts, and temporary fans, sufficient to provide no less than three (3) air changes per hour.
 2. When continuous ventilation is not practical via temporary fans and exhaust to outside, then ventilation shall be supplied via the building's HVAC system and shall comply with the following requirements:
 - a. Provide temporary air filters at return air grilles.
 - b. Provide 100% outside air. Relative humidity not to exceed 60%.
 - c. Provide a minimum of three (3) air changes per hour.
 3. Maintain continuous ventilation for a minimum period of 72 hours after installation of VOC-Emitting Materials, unless otherwise indicated elsewhere in these Specifications.
 4. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
- C. Preconditioning: Prior to installation, allow contractor-furnished contractor-installed VOC-Emitting Furnishings and Equipment as identified in paragraph 1.04 of this Specification to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions.
1. Remove containers and packaging to maximize off-gassing of VOCs.
 2. Precondition products in ventilated warehouse or other ventilated building. Preconditioning at the project site is acceptable, provided that Temporary Construction Ventilation and Sequencing measures are taken as described elsewhere in this Specification.
 3. Products requiring preconditioning include, at minimum, contractor-furnished and contractor-installed VOC-Emitting Furnishings and Equipment that contain vinyl or other flexible plastics, resins, adhesives, foam rubber, and fiberboards with urea-formaldehyde binders. Products bearing Greenguard certification (www.greenguard.org) shall be excluded from the preconditioning requirement.

3.03 SEQUENCING

- A. On-Site Application: Where VOC-Emitting Materials as identified in paragraph 1.03 of this Specification are applied on-site, apply prior to installation of Porous and Fibrous Materials as identified in paragraph 1.04 of this Specification. Maintain continuous ventilation for a period of 72 hours before installation of porous and fibrous materials.
 - 1. Where this sequencing requirement is not possible, protect porous materials with polyethylene vapor retarders. Tape all polyethylene edges to insure a complete seal. Maintain continuous ventilation per temporary construction ventilation requirements described above for a period of 72 hours before removing polyethylene.
- B. Completion: Complete interior finish material installation prior to Building Flush-Out as described in paragraph 3.06 of this Specification.

3.04 PROTECTION

- A. Moisture Protection: Protect interior materials from water intrusion or penetration as described in Section 01 60 00 Product Requirements.
 - 1. Porous or fibrous materials with visible microbial growth shall not be installed.
 - 2. Non-porous materials with visible microbial growth shall be decontaminated.
- B. Duct Protection: during dust-producing activities (e.g. sanding, cutting, or grinding), or when VOC-Emitting Materials (as described in paragraph 1.04 above) are being installed, implement the following measures:
 - 1. If possible, damper off the return (negative pressure) side of HVAC air distribution system and seal return system openings with polyethylene sheet.
 - 2. If HVAC system must be operated during dust-producing activities, provide temporary construction air filters with a minimum MERV rating of 8 at all return air grilles.
 - 3. If HVAC supply air is off, protect diffusers and openings with polyethylene sheet.

3.05 CLEANING

- A. Provide the following cleaning in addition to requirements described in 01 77 00 Project Closeout:
 - 1. Clean all coils, air filters, and fans prior to Testing and Balancing.
 - 2. If significant dust collection is observed at diffusers, return air grilles, or in ducts, clean prior to system start-up.

BUILDING FLUSH-OUT

- A. Just prior to Substantial Completion, but following Testing and Balancing, flush out building using the building HVAC system, maintaining a minimum temperature of 60° F and maximum 60% relative humidity. Provide a total of 14,000 cubic feet of outside air per square foot of floor area building flush out as follows:
 - 1. Prior to building occupancy, provide 3,500 cubic feet of outdoor air per square foot of floor area.
 - 2. Following building occupancy, provide a minimum ventilation rate of 0.30 cfm/sq. ft. of outside air or the design minimum outside air rate, whichever is greater. Maintain these conditions beginning a minimum of three (3) hours prior to daily occupancy and extending through daily occupancy hours, until the remainder of the 14,000 cfm of outside air per square foot of floor area is achieved.
- B. Insure that MERV 13 air filters are in place during Building Flush-Out.
- C. Installation of furniture and equipment may occur during Building Flush-Out.
- D. Return ventilation system to normal operation following Building Flush-Out period to minimize energy consumption.
- E. Immediately following Building Flush-Out, replace air filters with new MERV 13 air filters. Air filters that handle solely outside air need not be replaced.

END OF SECTION

CONSTRUCTION INDOOR AIR QUALITY (IAQ) PLAN

GENERAL CONTRACTOR:

Name: _____ Title: _____

Telephone: _____ Fax: _____

Email: _____

I have read and understood and will implement the following Construction IAQ Plan:

Signature: _____ Date: _____

I. CONSTRUCTION VENTILATION

List all project materials requiring Construction Ventilation per Specification Section 01 81 19. Attach additional sheet if necessary.

Y / N	Ventilation will be supplied via open windows, temporary ducts, and temporary fans. If "Y", then supply air diffusers, return air grilles, and/or open ducts will be sealed.
Y / N	Ventilation will be supplied via area exhaust fans. If "Y", check applicable: <input type="checkbox"/> Supply air diffusers, return air grilles, and/or open ducts will be sealed. Make-up air will be provided through open windows or doors or other transfer air devices. <input type="checkbox"/> HVAC system will provide make-up air. Return air grilles will be sealed.
Y / N	Ventilation will be supplied via building's HVAC system. If "Y", check applicable: <input type="checkbox"/> Return air grilles are sealed. Exhaust is provided via open windows or doors. <input type="checkbox"/> Return air grilles are used for exhaust. HVAC will provide 100% outside air. Air filters with a minimum MERV rating of 6 will be provided at return air grilles.
<input type="checkbox"/> Required	Areas will be ventilated directly to outside. No ventilated air will be returned.
<input type="checkbox"/> Required	Ventilation will provide no less than three air changes per hour.
<input type="checkbox"/> Required	Ventilation will be continuous for a period no less than 72 hours after completion of installation.
<input type="checkbox"/> Required	All filtration used during Construction Ventilation will be replaced prior to Substantial Completion.

II. PRECONDITIONING

List all project materials requiring Preconditioning per Specification Section 01 81 19. Attach additional sheet if necessary.

(continued)

II. PRECONDITIONING (continued)

Y / N	Preconditioning will occur in dry and well-ventilated offsite location. If "Y": Where is the offsite location? _____
Y / N	Preconditioning will occur onsite. If "Y", check applicable: <input type="checkbox"/> Ventilation will be supplied via open windows, temporary ducts, and temporary fans. See I.2a above. <input type="checkbox"/> Ventilation will be supplied via area exhaust fans. See I.2b above. <input type="checkbox"/> Ventilation will be supplied via building's HVAC system. See I.2c above.
<input type="checkbox"/> Required	Containers and packaging will be removed prior to Preconditioning.
<input type="checkbox"/> Required	Preconditioning will occur for fourteen (14) continuous days prior to installation.

III. SEQUENCING

List all project materials requiring Sequencing consideration per Specification Section 01 81 19. Attach additional sheet if necessary.

<input type="checkbox"/> Required	Previously installed Porous or Fibrous Materials located in a room where VOC-Emitting Materials are to be installed will be protected with polyethylene vapor retarder. Polyethylene will not be removed until completion of a 72-hour ventilation period.
<input type="checkbox"/> Required	Installation of interior finish materials will complete fourteen (14) days prior to Substantial Completion.

IV. PROTECTION

List all project materials requiring Protection per Specification Section 01 81 19. Attach additional sheet if necessary.

<input type="checkbox"/>	Porous or Fibrous Materials with visible microbial growth shall not be installed.
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Require d	
<input type="checkbox"/> Require d	Materials that are not defined as Porous or Fibrous with visible microbial growth shall be decontaminated prior to installation.
<input type="checkbox"/> Require d	Temporary ventilation will be provided during all dust producing activities. See Item I Construction Ventilation above. All supply air diffusers and return air grilles will be covered.
<input type="checkbox"/> Require d	Ducts will be sealed during transportation, delivery, and construction.

SECTION 01 91 13

GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General requirements that apply to implementation of commissioning without regard to systems, subsystems, and equipment being commissioned.
- B. Related Sections
 - 1. Section 01 35 43, Special Environmental Requirements
 - 2. Section 23 08 00, HVAC Systems Commissioning for specific requirements for commissioning.
 - 3. Section 26 08 00, Electrical Systems Commissioning

1.02 DEFINITIONS

- A. BoD: Basis of Design.
- B. CxA: Commissioning Authority.
- C. OPR: Owner's Project Requirements.
- D. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.
- E. TAB: Testing, Adjusting, and Balancing.

1.03 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s): Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of each Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.
- B. Members Appointed by Owner:
 - 1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.
 - 2. Representatives of the facility user and operation and maintenance personnel.
 - 3. Architect and engineering design professionals.

1.04 OWNER'S RESPONSIBILITIES

- A. Provide the OPR documentation to the CxA and each Contractor for use in developing the commissioning plan; systems manual; operation and maintenance training plan; and testing plans and checklists.
- B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities including, but not limited to, the following:
 - 1. Coordination meetings.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Testing meetings.
 - 4. Demonstration of operation of systems, subsystems, and equipment.
- C. Provide the BoD documents prepared by Architect and approved by Owner, to the CxA and each Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. Provide utility services required for the commissioning process.
- B. Each Contractor shall assign representatives with expertise and authority to act on behalf of the Contractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
 - 1. Participate in design- and construction-phase coordination meetings.
 - 2. Participate in maintenance orientation and inspection.
 - 3. Participate in operation and maintenance training sessions.
 - 4. Participate in final review at acceptance meeting.
 - 5. Certify that Work is complete and systems are operational according to the Contract Documents, including calibration of instrumentation and controls.
 - 6. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 - 7. Review and approve final commissioning documentation.
- C. Subcontractors shall assign representatives with expertise and authority to act on behalf of subcontractors and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
 - 1. Participate in design- and construction-phase coordination meetings.
 - 2. Participate in maintenance orientation and inspection.
 - 3. Participate in procedures meeting for testing.
 - 4. Participate in final review at acceptance meeting.
 - 5. Provide schedule for operation and maintenance data submittals, equipment startup, and testing to CxA for incorporation into the commissioning plan. Update schedule on a weekly basis throughout the construction period.
 - 6. Provide information to the CxA for developing construction-phase commissioning plan.
 - 7. Participate in training sessions for Owner's operation and maintenance personnel.

8. Provide updated Project Record Documents to the CxA on a daily basis.
9. Gather and submit operation and maintenance data for systems, subsystems, and equipment to the CxA, as specified in Division 01 Section "Operation and Maintenance Data."
10. Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures and participate in testing of installed systems, subsystems, and equipment.

1.06 CxA'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Prepare a construction-phase commissioning plan. Collaborate with each Contractor and with subcontractors to develop test and inspection procedures. Include design changes and scheduled commissioning activities coordinated with overall Project schedule. Identify commissioning team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task.
- C. Review and comment on submittals from each Contractor for compliance with the OPR, BoD, Contract Documents, and construction-phase commissioning plan. Review and comment on performance expectations of systems and equipment and interfaces between systems relating to the OPR and BoD.
- D. Convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss progress of the commissioning processes. Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The CxA shall prepare and distribute minutes to commissioning team members and attendees within five workdays of the commissioning meeting.
- E. At the beginning of the construction phase, conduct an initial construction-phase coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for operation and maintenance submittals; operation and maintenance training sessions; TAB Work; and Project completion.
- F. Observe and inspect construction and report progress and deficiencies. In addition to compliance with the OPR, BoD, and Contract Documents, inspect systems and equipment installation for adequate accessibility for maintenance and component replacement or repair.
- G. Prepare Project-specific test and inspection procedures and checklists.
- H. Schedule, direct, witness, and document tests, inspections, and systems startup.
- I. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.
- J. Certify date of acceptance and startup for each item of equipment for start of warranty periods.

- K. Review Project Record Documents for accuracy. Request revisions from Contractor to achieve accuracy. Project Record Documents requirements are specified in Division 01 Section "Project Record Documents."
- L. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the OPR, BoD, and Contract Documents. Operation and maintenance documentation requirements are specified in Division 01 Section "Operation and Maintenance Data."
- M. Prepare operation and maintenance training program and provide qualified instructors to conduct operation and maintenance training. Operation and maintenance training is specified in Division 01 Section "Demonstration and Training."
- N. Videotape and edit training sessions.
- O. Videotape construction progress including hidden shafts.
- P. Prepare commissioning reports.
- Q. Assemble the final commissioning documentation, including the commissioning report and Project Record Documents.

1.07 COMMISSIONING DOCUMENTATION

- A. Index of Commissioning Documents: CxA shall prepare an index to include storage location of each document.
- B. OPR: A written document, prepared by Owner, that details the functional requirements of Project and expectations of how it will be used and operated. This document includes Project and design goals, measurable performance criteria, budgets, schedules, success criteria, and supporting information.
- C. BoD Document: A document, prepared by Architect, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- D. Commissioning Plan: A document, prepared by CxA, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process, and shall include, but is not limited to the following:
 - 1. Plan for delivery and review of submittals, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the commissioning processes. Submittal dates shall include the latest date approved submittals must be received without adversely affecting commissioning plan.
 - 2. Description of the organization, layout, and content of commissioning documentation (including systems manual) and a detailed description of documents to be provided along with identification of responsible parties.
 - 3. Identification of systems and equipment to be commissioned.

4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.
 5. Identification of items that must be completed before the next operation can proceed.
 6. Description of responsibilities of commissioning team members.
 7. Description of observations to be made.
 8. Description of requirements for operation and maintenance training, including required training materials.
 9. Description of expected performance for systems, subsystems, equipment, and controls.
 10. Schedule for commissioning activities with specific dates coordinated with overall construction schedule.
 11. Identification of installed systems, subsystems, and equipment, including design changes that occurred during the construction phase.
 12. Process and schedule for documenting changes on a continuous basis to appear in Project Record Documents.
 13. Process and schedule for completing pre-start and startup checklists for systems, subsystems, and equipment to be verified and tested.
 14. Step-by-step procedures for testing systems, subsystems, and equipment with descriptions for methods of verifying relevant data, recording the results obtained, and listing parties involved in performing and verifying tests.
- E. Test Checklists: CxA, with assistance of Architect, shall develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. Prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Provide space for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in Division 01, General Requirements for commissioning HVAC systems. Each checklist, regardless of system, subsystem, or equipment being tested, shall include, but not be limited to, the following:
1. Name and identification code of tested item.
 2. Test number.
 3. Time and date of test.
 4. Indication of whether the record is for a first test or retest following correction of a problem or issue.
 5. Dated signatures of the person performing test and of the witness, if applicable.
 6. Individuals present for test.
 7. Deficiencies.
 8. Issue number, if any, generated as the result of test.
- F. Certificate of Readiness: Certificate of Readiness shall be signed by each Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing. Completed test checklists signed by the responsible parties shall accompany this certificate.

- G. Test and Inspection Reports: CxA shall record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application shall be included with data. CxA shall compile test and inspection reports and test and inspection certificates and include them in systems manual and commissioning report.
- H. Corrective Action Documents: CxA shall document corrective action taken for systems and equipment that fail tests. Include required modifications to systems and equipment and revisions to test procedures, if any. Retest systems and equipment requiring corrective action and document retest results.
- I. Issues Log: CxA shall prepare and maintain an issues log that describes design, installation, and performance issues that are at variance with the OPR, BoD, and Contract Documents. Identify and track issues as they are encountered, documenting the status of unresolved and resolved issues.
 - 1. Creating an Issues Log Entry:
 - a. Identify the issue with unique numeric or alphanumeric identifier by which the issue may be tracked.
 - b. Assign a descriptive title of the issue.
 - c. Identify date and time of the issue.
 - d. Identify test number of test being performed at the time of the observation, if applicable, for cross-reference.
 - e. Identify system, subsystem, and equipment to which the issue applies.
 - f. Identify location of system, subsystem, and equipment.
 - g. Include information that may be helpful in diagnosing or evaluating the issue.
 - h. Note recommended corrective action.
 - i. Identify commissioning team member responsible for corrective action.
 - j. Identify expected date of correction.
 - k. Identify person documenting the issue.
 - 2. Documenting Issue Resolution:
 - a. Log date correction is completed or the issue is resolved.
 - b. Describe corrective action or resolution taken. Include description of diagnostic steps taken to determine root cause of the issue, if any.
 - c. Identify changes to the OPR, BoD, or Contract Documents that may require action.
 - d. State that correction was completed and system, subsystem, and equipment is ready for retest, if applicable.
 - e. Identify person(s) who corrected or resolved the issue.
 - f. Identify person(s) documenting the issue resolution.
 - 3. Issues Log Report: On a periodic basis, but not less than for each commissioning team meeting, CxA shall prepare a written narrative for review of outstanding issues and a status update of the issues log. As a minimum, CxA shall include the following information in the issues log and expand it in the narrative:
 - a. Issue number and title.
 - b. Date of the identification of the issue.
 - c. Name of the commissioning team member assigned responsibility for resolution.

d. Expected date of correction.

- J. Commissioning Report: CxA shall document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment. The commissioning report shall indicate whether systems, subsystems, and equipment have been completed and are performing according to the OPR, BoD, and Contract Documents. The commissioning report shall include, but is not limited to, the following:
1. Lists and explanations of substitutions; compromises; variances in the OPR, BoD, and Contract Documents; record of conditions; and, if appropriate, recommendations for resolution. This report shall be used to evaluate systems, subsystems, and equipment and shall serve as a future reference document during Owner occupancy and operation. It shall describe components and performance that exceed requirements of the OPR, BoD, and Contract Documents and those that do not meet requirements of the OPR, BoD, and Contract Documents. It may also include a recommendation for accepting or rejecting systems, subsystems, and equipment.
 2. OPR and BoD documentation.
 3. Commissioning plan.
 4. Testing plans and reports.
 5. Corrective modification documentation.
 6. Issues log.
 7. Completed test checklists.
 8. Listing of off-season test(s) not performed and a schedule for their completion.
- K. Systems Manual: CxA shall gather required information and compile systems manual. Systems manual shall include, but is not limited to, the following:
1. OPR and BoD, including system narratives, schematics, and changes made throughout the Project.
 2. Project Record Documents as specified in Division 01 Section "Project Record Documents."
 3. Final commissioning plan.
 4. Commissioning report.
 5. Operation and maintenance data as specified in Division 01 Section "Operation and Maintenance Data."

1.08 SUBMITTALS

- A. Commissioning Plan Pre-final Submittal: CxA shall submit two hard copies of pre-final commissioning plan. Deliver one copy to each Contractor, one to Owner, and one to Architect. Present submittal in sufficient detail to evaluate data collection and arrangement process. One copy, with review comments, will be returned to the CxA for preparation of the final construction-phase commissioning plan.
- B. Commissioning Plan Final Submittal: CxA shall submit two hard copies and two sets of electronically formatted information of final commissioning plan. Deliver one hard copy and one set of discs to Owner, and one copy to Architect. The final submittal must address previous review comments. The final submittal shall include a copy of the pre-final submittal review comments along with a response to each item.

- C. Test Checklists and Report Forms: CxA shall submit sample checklists and forms to each Contractor quality-control manager and subcontractors for review and comment. Submit two copies of each checklist and report form.
- D. Certificates of Readiness: CxA shall submit Certificates of Readiness.
- E. Test and Inspection Reports: CxA shall submit test and inspection reports.
- F. Corrective Action Documents: CxA shall submit corrective action documents.
- G. Pre-final Commissioning Report Submittal: CxA shall submit two hard copies of the pre-final commissioning report. Include a copy of the preliminary submittal review comments along with CxA's response to each item. CxA shall deliver one copy to Owner and one copy to Architect. One copy, with review comments, will be returned to the CxA for preparation of final submittal.
- H. Final Commissioning Report Submittal: CxA shall submit two hard copies and two sets of electronically formatted information of the final commissioning report. CxA shall deliver one hard copy and one set of discs to Owner, and one copy to Architect. The final submittal must address previous review comments and shall include a copy of the pre-final submittal review comments along with a response to each item.

1.09 QUALITY ASSURANCE

- A. Instructor Qualifications: Factory-authorized service representatives, experienced in training, operation, and maintenance procedures for installed systems, subsystems, and equipment.
- B. Test Equipment Calibration: Comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been calibrated within six months prior to use.

1.010 COORDINATION

- A. Coordinating Meetings: CxA shall conduct weekly coordination meetings of the commissioning team to review progress on the commissioning plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities.
- B. Pre-testing Meetings: CxA shall conduct pretest meetings of the commissioning team to review startup reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.
- C. Testing Coordination: CxA shall coordinate sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- D. Manufacturers' Field Services: CxA shall coordinate services of manufacturers' field services.

PART 2 - PRODUCTS

2.01 NOT USED.

PART 3 - EXECUTION

3.01 OPERATION AND MAINTENANCE TRAINING REQUIREMENTS

- A. Training Preparation Conference: Before operation and maintenance training, CxA shall convene a training preparation conference to include Owner's operation and maintenance personnel, each Contractor, and subcontractors
1. Review the OPR and BoD.
 2. Review installed systems, subsystems, and equipment.
 3. Review instructor qualifications.
 4. Review instructional methods and procedures.
 5. Review training module outlines and contents.
 6. Review course materials (including operation and maintenance manuals).
 7. Inspect and discuss locations and other facilities required for instruction.
 8. Review and finalize training schedule and verify availability of educational materials, instructors, audiovisual equipment, and facilities needed to avoid delays.
 9. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.
- 3.02 Training Modules: Develop an instruction program that includes individual training modules for each system, subsystem, and equipment as specified in Division 01, General Requirements for Demonstration and Training.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Hardware for doors.
- B. Electronic Hardware
- C. Thresholds
- D. Gasketing

1.02 REFERENCES

- A. CAS/CAR - California Accessibility Statutes and California Accessibility Regulations, January 2003 and 2001 California Building Code. BHMA A156.18 - Materials and Finishes.
- B. DHI-02 - Installation Guide for Doors and Hardware.
- C. DHI-03 - Keying Systems and Nomenclature.
- D. U.L. - Underwriters' Laboratories 2002 Edition.
- E. Uniform Building Code - UBC Standards 7-2 Fire Door Assemblies.
- F. Uniform Building Code - UBC Standards 10-4 Panic Hardware.
- G. MIL-R-6130 - Rubber, Cellular, Chemically Blown.
- H. MIL-R-6855/3 - Rubber, Synthetic, Rods (or Rounds).
- I. Chapters 10 and 11- 2001 California Building Code.

1.03 COORDINATION

- A. Coordinate Work of this Section with other directly affected Sections involving manufacture of any internal reinforcement for door hardware.
- B. Coordinate electronic hardware with electrical engineer and section 16722

1.04 QUALITY ASSURANCE

- A. Manufacturers: Companies with a minimum of ten years experience specializing in manufacture of door hardware.

- B. Hardware Supplier: Company with a minimum of five years experience specializing in supplying institutional door hardware.
- C. Hardware supplier shall be a direct factory contract supplier who has in his employment a certified hardware consultant (AHC) who will be made available at all reasonable times during the course of the Work for project hardware consultation to the Owner, Architect, and Contractor.

1.05 REGULATORY REQUIREMENTS

- A. Conform to Chapters 10 and 11, California Building Code and NFPA 80, for requirements applicable to fire-rated doors and frames. Conform to CAS/CAR for positioning requirements for accessibility, and conform to CBC Sections 1133B.2.1, 1133B.2.5.1, 1003.3.1.8 and 1133B.2.4.1 for thresholds, California Building Code.
- B. Conform to the applicable sections of NFPA 101 and NFPA 105, and CBC.
- C. Provide UL labels on all exiting devices in fire-rated openings.
- D. Provide California State Fire Marshal listing for all fire exit hardware.

1.06 SUBMITTALS

- A. Submit six copies of schedule per Section 01330. Only submittals printed one sided will be accepted and reviewed. Organize vertically formatted schedule into "Hardware Sets" with index of doors and headings, indicating complete designations of every item required for each door or opening
- B. Shop drawings indicating locations and mounting heights of each type of hardware.
- C. Product data on specified hardware.
- D. Schedule: Indicate quantity, part number and installation location.
- E. Final keying charts for Owner approval.
- F. Manufacturers' parts lists, templates, and installation instructions.
- G. Manufacturers' certificates that fire-rated hardware meets or exceeds specified requirements.
- H. Items listed with "no substitute manufacturers" shall match existing.
- I. Operation and maintenance data. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Package hardware items individually by doors, group small items together, label and identify package with door opening code to match hardware schedule. Identify location of each door opening. Deliver in strong, sturdy containers.
- B. Deliver keys to Owner by security shipment direct from hardware supplier.
- C. Protect hardware from theft by cataloging and storing in dry, secure area.

1.08 GUARANTEE

- A. Provide under provisions of Division 01, General Requirements.
- B. Provide a 2-year guarantee. Said guarantee shall read as follows: "For a period of not less than two (2) years, we (Firm Name) will service and or replace, at no charge to the Owner, any part proving defective due to faulty manufacture or materials. Door closers shall be guaranteed for ten (10) years. Exit Devices shall be guaranteed for three (3) years. This guarantee does not cover abnormal operation or abusive jobsite treatment after Date of filing of certificate of Certified Completion."

1.09 MAINTENANCE MATERIALS

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.010 GENERAL REQUIREMENTS

- A. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from only one manufacturer, although several may be indicated as offering products complying with requirements.
- B. Furnish all items of hardware required to complete the Work in accordance with these Specifications and the manufacturer's instructions. Items of hardware not specified shall be provided even though inadvertently omitted from this Specification. Items shall be of equal quality and type.
- C. Where the exact types of hardware specified are not adaptable to the finished shape or size of the members requiring hardware, submit for approval suitable alternative types having as nearly as practicable the same operation and quality as the type specified, subject to Architect's approval.

- D. Schedule Designation: Except as otherwise indicated, the use of one manufacturer's numeric designation system in schedule does not imply that another manufacturer's products will not be acceptable, unless they are not equal in design, size, weight, finish, function, or other quality of significance, and unless "no substitute manufacturers" is a requirement of this Specification.
- E. Exit Doors: Openable at all times from the inside without the use of a key or any special knowledge or effort.
- F. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA 80. This requirement takes precedence over other requirements for such hardware. Provide only such hardware that has been tested and listed by UL for the type and size of each door required, and complies with the requirements of the door and door frame. Latching hardware, door closers, ball bearing hinges, and seals are required whether listed in the Hardware Schedule or not.
 - 1. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label indicating "Fire door to be Equipped with Fire Exit Hardware", and provide UL label on exit device indicating "Fire Exit Hardware".
 - a. Provide a readily, durable sign on or adjacent to door stating, "This door to remain unlocked whenever the building is occupied"
 - 1) Sign letters shall not be less than one inch (25.4 mm) high on contrasting background.
 - 2. Hardware for smoke-control door assemblies shall be installed in accordance with NFPA 105.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Products of following manufacturer or supplier form basis for design and quality intended:

	Specified	Approved
1. Hinges:	Ives	Hager
2. Latch/Lock Sets:	Schlage	Campus Standard
3. Exit Devices:	Von Duprin	Campus Standard
4. Closers:	LCN	Campus Standard
5. Coordinator & Auto Bolts:	Ives	Rockwood
6. Stops:	Ives	Rockwood
7. Protection Plates:	Ives	Rockwood
8. Overhead Stops:	Glynn Johnson	ABH
9. Gasketing:	NGP	Zero
10. Thresholds:	NGP	Zero
11. Continuous Hinge:	IVES	Select

- B. Or equal as approved in accordance with Division 01 for Substitutions.

2.02 KEYING

- A. Comply with DHI-03 for keying systems and nomenclature.
- B. Door Locks: Provide all cylinders in Schlage C keyway, zero bitted. Campus locksmith will key cylinders
- C. Supply 4 keys for each lock.

2.03 FINISHES

- A. Finish shall be BHMA 626 Dull Chrome, as listed in BHMA A156.18. Areas using BHMA 626 shall have push, pulls and kickplates of BHMA, 630 stainless steel. Spray door closers to match other hardware unless otherwise noted.
- B. Finishes to conform to the following standards and symbols:

	Finish/Description	US Symbol	BHMA No.
1.	Satin Chromium	26D	626
2.	Satin Stainless Steel	32D	630
3.	Clear Anodized	28	628
4.	Dull Chromium on Steel --		652
5.	Spray Paint Aluminum --		689

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that power supply is available to power operated devices.
- C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturers' instructions.
- B. Use the templates provided by hardware item manufacturer.
- C. Mounting heights for hardware:
 - 1. Locksets: 40-5/16 inches from floor to centerline of lever handle.
 - 2. Butts: Top hinge 5 inches from head of opening to top of hinge; bottom hinge 10 inches from door bottom to bottom of hinge; intermediate butt spaced equidistant between top and bottom butts.

- D. Conform to CBC Section 1133B.2.5.2 for positioning requirements for accessibility and Sections 1133B.2.1 and 1003.3.1.8. of CBC.
- E. After fitting hardware to doors, remove all finish hardware, carefully replace in properly marked boxes, and place in storage until painting and finishing is completed. After painting and finishing is completed, permanently install finish hardware. Comply with DHI-02 for installation of hardware.
- F. Secure finish hardware with suitable fasteners of the same material and finish as the item being attached.
- G. Provide expansion anchors for attaching hardware items to concrete or masonry as specified in Division 01.
- H. Mount exit devices and closers on mineral or particle core fire doors with closed head sex bolts.
- I. Make allowances to be able to install electronic hardware at any opening in the future

3.03 FASTENERS

- A. Screws for strikes, face plates and similar items shall be flathead, countersunk type; provide machine screws for metal, and standard wood screws for wood.
- B. Screws for butt hinges shall be flathead, countersunk, full-thread type.
- C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.

3.04 MATERIALS

- A. Locksets: Strikes shall be 16 gauge curved steel, bronze or brass with 1" deep box construction, and have lips of sufficient length to clear trim and protect clothing.
 - 1. Locks shall have minimum 3/4-inch throw.
 - 2. Comply with requirements of local security ordinances.
 - 3. Provide approved fusible links at levers for labeled doors.
 - 4. Lock Series and Design: As scheduled.
- B. Hinges: Outswinging exterior doors shall have non-removable (NRP) pin. All hinge open widths shall be minimum, but of sufficient size to permit door to swing 180 degrees. Furnish hinges with steel pins and flush bearings.
 - 1. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
 - 2. Size listed in Hardware Sets indicates height.

- C. Panic Hardware: Hardware shall not require the ability to grasp to open door, Section CBC 1133B.2.5. [Furnish all sets at wood doors with sex bolts unless otherwise specified]. Lever handle trim shall match locksets. All Touch Bar type devices shall have deadlocking latchbolt, stainless steel touch pads or vinyl covered pads and be non-handed and pads shall not extend across more than 1/2 of the width of the door measured from the latch side when doors are pivoted or balanced. The unlatching force shall be by Authority having Jurisdiction and may increase the maximum effort to operate doors required to be fire rated to achieve positive latching, but in no case shall the pressure exceed 15 pounds per CBC 2001, Section 1133B.2.5 when applied in the direction of exit travel. Mount minimum 36 inches from underside of panic hardware to 44 inches above finish floor. [Deadlocking latchbolt shall be interconnected with latching mechanism]. Comply with CBC Sections 1002, 1003.3.1.9 and UBC Standard 10-4.
- D. Surface Door Closers: Full rack and pinion type with removable non-ferrous case. Provide sex bolts and grommets at all wood doors. Place closers inside building, stairs, and rooms. Closers shall be non-handed, non-sized, and adjustable.
1. Provide sizes 2 through 6 unless otherwise specified at exterior and interior fire rated doors.
 2. Provide size 1 through 4 at interior non-rated doors.
 3. Flush transom offset brackets shall be used where parallel arm closers are listed for doors with fixed panels over.
 4. Drop brackets are required at narrow head rails.
 5. Exterior doors shall have 5.0 lbs. maximum pressure to open. Interior doors shall have 5.0 lbs. maximum pressure to open.
 6. Comply with Section 1133B.2.5.1, Title - 24, California Access Compliance Manual-California Access Regulations for closer delay time.
- E. Kick Plates: Provide with four beveled edges, 10-inches high by width less 2-inches. Furnish with machine or wood screws of bronze or stainless steel to match other hardware.
- F. Seals: All seals shall be finished to match adjacent frame color. Solid neoprene shall conform to MIL Spec. R6855-CL III, Grade 40. Sponge neoprene shall conform to MIL Spec. R6130, Type II, Group C. U.L label shall be applied on all rated doors.
- G. Screws: All exposed screws shall be phillips head.
- H. Thresholds: Comply with Section 1133B.2.4.1 CBC.

3.05 DOOR CLOSERS

- A. Provide adjustable closers with the following maximum pressure for opening doors. Adjust closers after installation, and test doors to assure compliance with the following:
 - 1. Interior Doors 5 pounds pressure (maximum)
 - 2. Exterior Doors 5 pounds pressure (maximum)
 - 3. Fire Doors The Authority having jurisdiction may increase maximum effort to operate door to achieve positive latching, but not to exceed 15 pounds.
 - 4. Closer sweep period: adjust so that from open position at 70 degrees, door will take at least 3 seconds to move to a point 3 inches from latch, measured to the landing edge of door, Section 1133B.2.51.
- B. Comply with Section 1133B.2.5 and 1133B.2.5.1 California Building Code.

3.06 MOUNTING SCREWS FOR HARDWARE

- A. Provision shall be made to prevent screws from working loose by the use of silicone sealant application to screw tips, or other approved method
- B. Inspection: Hardware supplier shall inspect all hardware furnished prior to Date of Certified Completion and include with his guarantee a statement that this has been accomplished. Contractor shall sign off the hardware as being complete and correctly installed and adjusted. Further corrections of defective material shall be the responsibility of the Contractor.

3.07 SILENCERS

- A. Provide Rubber Silencers:
 - 1. Three on jambs of all doors except fire-rated doors.
 - 2. One at head of each leaf at double doors except fire-rated doors.

3.08 FLOOR STOPS

- A. Floor stops shall not be installed in any path of travel and 4 inches maximum from wall. At these locations provide wall bumpers or swing limiters on doors to remove trip hazards for the visually impaired. DSA Policy 99-08.

3.09 SCHEDULE OF FINISH HARDWARE

- A. The items listed in the following "Schedule of Finish Hardware" shall conform throughout to the requirements of the foregoing Specification. The last column of abbreviations in the Hardware Schedule refers to the manufacturer listed above.

- B. The Door Schedule on the Drawings indicated which Hardware Set is used with each door.

SPECWORKS # 91440

HW SET: 01

3	EA	HINGE	3CB1HW 5 X 4.5 NRP SEC STUD	630	IVE
1	EA	STOREROOM LOCK	L9080P 06A X L/OST	626	SCH
1	EA	DOOR PULL	VR900	630	IVE
1	EA	OH HOLDER	90H	630	GLY
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 02

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	EXIT DEVICE	98NL/OP	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	DOOR PULL	VR910NL	630	IVE
1	EA	CLOSER	4041-EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 03

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	PRIVACY LOCK	L9040 06A XL11-800	626	SCH
1	EA	CLOSER	4041-DA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 04

3	EA	HINGE	3CB1 4.5 X 4.5 NRP SEC STUD	630	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	CLOSER	4041-EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 05

3	EA	HINGE	3CB1HW 5 X 4.5 NRP SEC STUD	630	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	DOOR PULL	VR900	630	IVE
1	EA	CLOSER	4041-SCNS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 06

NOT USED

MOD

HW SET: 06A

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	POWER TRANSFER	EPT2	689	VON
1	EA	MULLION	5654	628	VON
1	EA	EXIT DEVICE	RX EL35EO	626	VON
1	EA	EXIT DEVICE	RX EL35NL-OP	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
2	EA	DOOR PULL	8190-0 10" CTOC	630	IVE
1	EA	CLOSER	4041-EDA	689	LCN
1	EA	CLOSER	4041-SCNS	689	LCN
2	EA	MOUNTING PLATE	4040-18	689	LCN
1	EA	THRESHOLD	AS DETAILED	AL	NGP
1	EA	POWER SUPPLY	PS873	GRY	VON
1	EA	POWER SUPPLY	PS873 X 2	GRY	VON
1	EA	WIRING DIAGRAM	91440-6A		VON

SEALS AND SWEEPS BY DOOR MANUFACTURER

CARD READER IN SECTION 16722

WHEN CREDENTIALS ARE PRESENTED THE RHR LEAF WILL RETRACT FOR ACCESS. THE LHR LEAF WILL STAY SECURE. DURING DESIGNATED HOURS BOTH LEAVES WILL STAY RETRACTED AND DOORS WILL BE PUSH/PULL

HW SET: 06B

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	POWER TRANSFER	EPT2	689	VON
1	EA	MULLION	5654	628	VON
1	EA	EXIT DEVICE	RX EL35EO	626	VON
1	EA	EXIT DEVICE	RX EL35NL-OP	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
2	EA	DOOR PULL	8190-0 10" CTOC	630	IVE
2	EA	CLOSER	4041-SCNS	689	LCN
2	EA	MOUNTING PLATE	4040-18	689	LCN
1	EA	THRESHOLD	AS DETAILED	AL	NGP
1	EA	POWER SUPPLY	PS873 X 2	GRY	VON
1	EA	WIRING DIAGRAM	91440-6B		VON

SEALS AND SWEEPS BY DOOR MANUFACTURER

CARD READER IN SECTION 16722

WHEN CREDENTIALS ARE PRESENTED THE RHR LEAF WILL RETRACT FOR ACCESS. THE LHR LEAF WILL STAY SECURE. DURING DESIGNATED HOURS BOTH LEAVES WILL STAY RETRACTED AND DOORS WILL BE PUSH/PULL

HW SET: 06C

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	POWER TRANSFER	EPT2	689	VON
1	EA	MULLION	5654	628	VON
2	EA	EXIT DEVICE	RX EL35EO	626	VON
2	EA	DOOR PULL	8190-0 10" CTOC	630	IVE
2	EA	CLOSER	4041-SCNS	689	LCN
2	EA	MOUNTING PLATE	4040-18	689	LCN
1	EA	THRESHOLD	AS DETAILED	AL	NGP
1	EA	POWER SUPPLY	PS873 X 2	GRY	VON
1	EA	WIRING DIAGRAM	91440-6C		VON

SEALS AND SWEEPS BY DOOR MANUFACTURER

NO CARD READER FOR THIS OPENING. THEY WILL STAY SECURE EXCEPT WHEN RELEASED DURING BUSINESS HOURS BY TIME ZONE

HW SET: 07

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	MULLION	KR4954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	EXIT DEVICE	98NL/OP	626	VON
2	EA	IC RIM CYLINDER	20-057	626	SCH
2	EA	DOOR PULL	VR910NL	630	IVE
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	CLOSER	4041-EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
2	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 07A

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	POWER TRANSFER	EPT2	689	VON
1	EA	MULLION	KR4954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FIRE EXIT DEVICE	RX EL99NL-OP	626	VON
2	EA	IC RIM CYLINDER	20-057	626	SCH
2	EA	DOOR PULL	VR910NL	630	IVE
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	CLOSER	4041-EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
2	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP
1	EA	POWER SUPPLY	PS873 X 2	GRY	VON
1	EA	WIRING DIAGRAM	91440-7A		VON

CARD READER IN SECTION 16722

WHEN CREDENTIALS ARE PRESENTED THE RHR LEAF WILL RETRACT FOR ACCESS. THE LHR LEAF WILL STAY SECURE. DURING DESIGNATED HOURS BOTH LEAVES WILL STAY RETRACTED AND DOORS WILL BE PUSH/PULL

HW SET: 07B

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	POWER TRANSFER	EPT2	689	VON
1	EA	MULLION	KR4954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	EXIT DEVICE	98EO	626	VON
1	EA	FIRE EXIT DEVICE	RX EL99NL-OP	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	DOOR PULL	VR910NL	630	IVE
1	EA	MULLION SEAL	5100	BLK	NGP
1	EA	CLOSER	4041-EDA	689	LCN
1	EA	CLOSER	4041-SCNS	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
2	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP
1	EA	POWER SUPPLY	PS873	GRY	VON
1	EA	WIRING DIAGRAM	91440-7B		VON

CARD READER IN SECTION 16722

WHEN CREDENTIALS ARE PRESENTED THE RHR LEAF WILL RETRACT FOR ACCESS. THE LHR LEAF IS FOR EMERGENCY EXITING ONLY AND HAS NO ELECTRONICS

HW SET: 08

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	MULLION	KR9954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FIRE EXIT DEVICE	98L-F	626	VON
2	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	CLOSER	4041-EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
2	EA	DOOR SWEEP	200NA	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 09

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCK	L9050P 06A XL11-800	626	SCH
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 10

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	EXIT DEVICE	98L	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 11

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 12

NOT USED MOD

HW SET: 13

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	FIRE EXIT DEVICE	98L-F	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 14

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	PASSAGE LATCH	L9010 06A	626	SCH
1	EA	CLOSER	4041-DA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 15

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	PRIVACY LOCK	L9040 06A XL11-800	626	SCH
1	EA	CLOSER	4041-DA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	MOP PLATE	8400 4" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 16

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 17

3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCK	L9050P 06A XL11-800	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 18

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	FIRE EXIT DEVICE	98L-F	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	CLOSER	4041-SCNS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 19

3	EA	HINGE	3CB1 4.5 X 4.5	630	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 20

3	EA	HINGE	3CB1 4.5 X 4.5	630	IVE
1	EA	PRIVACY LOCK	L9040 06A XL11-800	626	SCH
1	EA	CLOSER	4041-SCNS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET	PERIMETER SEAL	165SA HEAD AND JAMBS	AL	NGP
1	EA	DOOR BOTTOM	423N	AL	NGP
1	EA	THRESHOLD	AS DETAILED	AL	NGP

HW SET: 21

NOT USED MOD

HW SET: 22

3	EA	HINGE	3CB1 4.5 X 4.5	630	IVE
1	EA	FIRE EXIT DEVICE	98L-F	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	THRESHOLD	AS REQUIRED BY FIRE RATING	AL	NGP

HW SET: 23

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	FIRE EXIT DEVICE	98L-F	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	THRESHOLD	AS REQUIRED BY FIRE RATING	AL	NGP

HW SET: 24

3	EA	HINGE	3CB1 4.5 X 4.5	630	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	THRESHOLD	AS REQUIRED BY FIRE RATING	AL	NGP

HW SET: 25

NOT USED

MOD

HW SET: 26

3	EA	HINGE	3CB1 4.5 X 4.5	630	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	THRESHOLD	AS REQUIRED BY FIRE RATING	AL	NGP

HW SET: 27

3	EA	HINGE	3CB1 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	L9080P 06A	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	THRESHOLD	AS REQUIRED BY FIRE RATING	AL	NGP

HW SET: 28

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	FIRE EXIT DEVICE	98L-F	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	CLOSER	4041	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	THRESHOLD	AS REQUIRED BY FIRE RATING	AL	NGP

HW SET: 29

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	SET	CL BOLT	FB51/61 AS REQ'D	630	IVE
1	EA	DP STRIKE	DP1/2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	L9070P 06A	626	SCH
1	EA	COORDINATOR	COR2-COMPLETE	628	IVE
1	EA	ASTRAGAL	139SP	600	NGP
1	EA	ASTRAGAL SEAL	5050N	BRN	NGP
2	EA	CLOSER	4041-SCNS	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 30

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	MULLION	KR4954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	EXIT DEVICE	98L	626	VON
2	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	MULLION SEAL	5100	BLK	NGP
1	EA	CLOSER	4041-EDA	689	LCN
1	EA	CLOSER	4041-SCNS	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 31

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	MULLION	KR4954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	EXIT DEVICE	98L	626	VON
2	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	CLOSER	4041-EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS18	BLK	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 32

NOT USED

MOD

HW SET: 32A

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	POWER TRANSFER	EPT2	689	VON
1	EA	MULLION	KR9954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	EXIT DEVICE	RX EL99DT-F X 994	626	VON
1	EA	FIRE EXIT DEVICE	RX EL99L-F	626	VON
1	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	CLOSER	4041	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	POWER SUPPLY	PS873 X 2	GRY	VON
1	EA	WIRING DIAGRAM	91440-32A		VON

CARD READER IN SECTION 16722

WHEN CREDENTIALS ARE PRESENTED THE RHR LEAF WILL RETRACT FOR ACCESS. THE LHR LEAF WILL STAY SECURE EXCEPT WHEN RELEASED DURING BUSINESS HOURS BY TIME ZONE

HW SET: 33

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	MULLION	KR9954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FIRE EXIT DEVICE	98L-F	626	VON
2	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	CLOSER	4041	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP

HW SET: 34

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	POWER TRANSFER	EPT2	689	VON
1	EA	MULLION	KR9954	689	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FIRE EXIT DEVICE	RX EL99L-F	626	VON
2	EA	IC RIM CYLINDER	20-057	626	SCH
1	EA	MULLION SEAL	5100	BLK	NGP
1	EA	CLOSER	4041	689	LCN
1	EA	CLOSER	4041-SCNS	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	SET	PERIMETER SEAL	160S HEAD & JAMBS	AL	NGP
1	EA	POWER SUPPLY	PS873 X 2	GRY	VON
1	EA	WIRING DIAGRAM	91440-34		VON

WHEN CREDENTIALS ARE PRESENTED THE RHR LEAF WILL UNLOCK FOR ACCESS. THE LHR LEAF WILL STAY SECURE EXCEPT WHEN RELEASED DURING BY TIME ZONE. DURING DESIGNATED HOURS BOTH DOORS WILL BE UNLOCKED
CARD READER IN SECTION 16722

HW SET: 35

1	EA	EXIT DEVICE	98EO	626	VON
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BALANCE OF HARDWARE BY GATE MANUFACTURER

END OF SECTION

SECTION 09 90 00

PAINTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes providing fluid applied paints and coatings. Upon completion of Work, all visible interior and exterior surfaces, within the Contract limits shall have a painter's finish unless scheduled "Not To Be Painted" in this Section.
 - 1. Each paint system includes:
 - a. Surface preparation, including touch-up of shop applied primers, if needed.
 - b. Prime coat application, where scheduled as part of finish system.
 - c. Finish coat application, where scheduled apply two or more finish coats.
 - 2. Paint semi-concealed areas (e.g. inside of light troughs and valances, behind grilles, and projecting edges above and below sight lines, behind wall-mounted items).
- B. Surfaces Not To Be Painted:
 - 1. Prefinished wall, ceiling, and floor coverings.
 - 2. Items with factory-applied final finish.
 - 3. Concealed ducts, pipes, and conduit.
 - 4. Glass, plastic laminate, ceramic tile, anodized aluminum.
 - 5. Surfaces of steel items that will be embedded in concrete.
 - 6. Surfaces specifically scheduled or noted on the Drawings not to be painted.
 - 7. Fire-Rating labels on doors and frames.
 - 8. Performance Rating labels on equipment.
- C. Related Sections:
 - 1. Section 01 35 43, Special Environmental Requirements
 - 2. Section 09 06 00, Schedule of Finishes

1.02 REFERENCES

- A. ASTM – American Society for Testing and Materials
 - 1. ASTM D4442 - Direct Moisture Content Measurement of Wood and Wood-Base Materials.
 - 2. ASTM D4444 - Use and Calibration of Hand-Held Moisture Meters
- B. SSPC - Steel Structures Painting Council.
- C. Green Seal Standard GS-11, Paints, First Edition, May 1993.
- D. Green Seal Standard GC-03, Anti Corrosive Paints, Second Edition, January 1997.
- E. SCAQMD – South Coast Air Quality Management District
 - 1. SCAQMD-1113 - Rule 1113, Architectural Coatings

1.03 SUBMITTALS

- A. Product Data for each paint system product and accessory item.
- B. Three Samples of each specified finish system color, texture, and sheen; samples shall be minimum 8-1/2 by 11 inches in size.
 - 1. Prepare transparent wood finish samples on type and quality of wood specified.
- C. Manufacturer's application instructions.
- D. Certified Copies of moisture test results.
- E. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for architectural paints, coatings, and primers applied to interior walls and ceilings; anti-corrosive and anti-rust paints applied on-site to interior ferrous metal substrates; and clear wood finishes, floor coatings, stains, sealers, and shellacs applied on-site to interior elements.
 - 1. Low-Emitting Materials Credit 4.2.

1.04 QUALITY ASSURANCE

- A. Manufacturers: Company with minimum 15-years experience manufacturing quality paint and finish products for commercial projects similar in scale and complexity to those required for this Project.
- B. Applicator: Company with minimum 5-years experience painting and finishing commercial projects similar in scale and complexity to those required for this Project.
- C. Materials, for each paint system, shall be by, or as recommended by, a single coating manufacturer for use together in commercial quality paint / coating system for the substrate and exposure conditions indicated.
- D. Regulatory Requirements
 - 1. Conform to SCAQMD-1113 for maximum VOC limits, copies of Rule 1113 are available at Architect's office.
 - 2. Comply with applicable codes and regulations of authorities having jurisdiction including those with jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this Specification, comply with the more stringent provisions.
- E. LEED Credit Point Requirements
 - 1. Architectural paints, coatings, and primers applied to interior walls and ceilings shall comply with VOC limits set by Green Seal Standard GS-11, Paints, First Edition, May 1993.
 - 2. Anti-corrosion paints applied on site to interior ferrous metal substrates shall comply with VOC limits set by Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition, January 1997.
 - 3. Clear (transparent) wood finishes, floor coatings, stains, sealers, and shellacs applied on site to interior elements shall comply with VOC limits set by South Coast Air Quality Management District, Rule 1113, Architectural Coatings.

- F. Field Samples. Provide Field Sample of each [[high performance] [_____]] finish system color, texture, and sheen scheduled. Do not proceed with coating application until sample panel has been approved.
1. Field Sample shall be full height of wall by 3 ft. or minimum 24 sq.ft, with least dimension of 4 ft.
 2. Locate as approved by Architect.
 3. Adjust materials and methods of installation as required to obtain Architect's approval.
 4. Document materials and methods used to obtain Architect's approval and maintain at least one copy of this documentation on site while related work is in progress.
 5. Maintain access to and protect Field Sample from damage while related work is in progress.
 6. Upon acceptance of related work, approved sample may remain as part of Work.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site in their original, sealed, undamaged containers with labels intact and legible.
1. Labels shall include manufacturer's name, type of paint, brand name, brand code, color designation, recommended surface preparation, typical coverage, drying times, cleanup procedures, and instructions for mixing and reducing, if permitted.
- B. Store paint materials ambient temperatures between 45- and 90-degrees F, in well ventilated area unless permitted otherwise by manufacturer's instructions.
- C. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during and 48 hours after application of finishes, unless permitted otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain, or when relative humidity is above 50 percent, unless permitted otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and transparent Finishes: 65 degrees F for interior or exterior, unless permitted otherwise by manufacturer's instructions.
- E. Provide lighting level sufficient to conduct painting operations.

1.07 MAINTENANCE

- A. For each color, type, and gloss of paint used in the work provide, as Extra Materials, a quantity equal to approximately 10 percent of the quantity required for its installation rounded to the nearest gallon, or five gallons, whichever is less.
 - 1. Extra Materials shall be from same production run as installed materials.
 - 2. Label each container with locations and dates of related installations; do not obscure manufacturer's label.
 - 3. Deliver Extra Materials to Site as directed by Owner.

1.08 GUARANTEE

- A. Guarantee the painting Work against peeling, fading, cracking, blistering or crazing for a period of two years from the Date of Certified Completion for painting of new surfaces and existing surfaces.

PART 2 - PRODUCTS

2.01 PAINTS AND COATINGS

- A. Acceptable Manufacturers. Products of following manufacturers form basis for design and quality intended.
 - 1. Vista Paint, Fullerton, CA
 - 2. Frazee Paints, Anaheim, CA
 - 3. Dunn-Edwards Corporation, Los Angeles, CA
 - 4. Sherwin-Williams Company, Cleveland, OH
 - 5. Kelly-Moore Paints, San Carlos, CA
 - 6. Or equal, approved in accordance with Division 01, General Requirements, for substitutions.

2.02 MATERIALS

- A. Coatings: Ready mixed, except field-catalyzed coatings. Process pigments to soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
- B. Colors and Glosses: As scheduled in Section 09 06 00. Architect will select color and hue to be used in various types of paint specified and will be sole judge of acceptability of various glosses obtained from materials proposed to be used in Work. During actual painting, Architect may make minor modifications in tone and shade to adjust for actual surface and lighting conditions encountered.
- C. Undercoats and Thinners. Provide undercoat paint produced by same manufacturer as finish coat. Use only thinners recommended by paint manufacturer and use only to recommended limits. Use undercoat, finish coat and thinner material as parts of a unified system of paint finish.
- D. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.

- E. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified of commercial quality.

2.03 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended by the manufacturer.
- B. Compatibility: Prior to actual use of application equipment, use all means necessary to verify that the proposed equipment is actually compatible with the material to be applied and that the integrity of the finish will not be jeopardized by use of the proposed application equipment.

2.04 FINISHES

- A. Refer to schedule at end of Section for surface finish. Notwithstanding product numbers listed in schedule, Contractor shall conform to most recent product numbers as published by the manufacturer.
- B. Refer to Section 09 24 00 for pigmented plaster. Prime coat color shall be approved by Architect prior to application. Color shall approximate color of pigmented plaster.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of Work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of new surfaces using an electronic moisture meter. Apply finishes only when moisture content of surfaces are below the following maximums. Conduct moisture measurements in presence of the project inspector, document readings and submit to Architect under Part 1.
 - 1. Plaster and Gypsum Wallboard: 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry: 12 Percent.
 - 3. Interior Located Wood: 15 percent, measured in accordance with ASTM D4442 and ASTM D4444.
 - 4. Exterior Located Wood: 19 percent, measured in accordance with ASTM D4442 and ASTM D4444.
- D. Beginning installation means acceptance of existing surfaces and conditions.

3.02 MATERIALS PREPARATION

- A. Mix and prepare painting material in accordance with manufacturer's recommendations.
- B. Store materials not in actual use in tightly covered containers.

- C. Maintain containers used in storage, mixing and application of paint in a clean condition, free from foreign materials and residue.
- D. Stir all materials before application to produce a mixture of uniform density and as required during the application of materials. Do not stir into the material any film that may form on the surface. Remove the film and strain the material before using.

3.03 SURFACE PREPARATION

- A. Remove electrical plates, hardware, light fixture trim and fittings prior to preparing surfaces for finishing.
- B. Correct minor defects and clean surfaces which affect Work of this section.
- C. Shellac and seal marks that may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Insulated Coverings: Remove dirt, grease and oil from canvas and cotton.
- F. Gypsum Board Surfaces: Fill minor defects, joints and nail head depressions with spackling compounds. Prime in accordance with primer manufacturer's recommendations. Apply primer over skim coat for Level 5 finish.
- G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering or corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- H. Plaster Surfaces: Fill hairline cracks, small holes and imperfections with patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- I. Surface Preparation for All Exterior Metal: Preparation in accordance with SSPC-6 Commercial Blast Cleaning.
- J. Galvanized Surfaces:
 - 1. Prepare galvanized steel and nonferrous metal surfaces in accordance with ASTM D 6386-Surface Preparation of Galvanized Surfaces and manufacturer's instructions.
 - 2. Ensure surfaces are dry.
 - 3. Interior Exposure (Dry/Benign): Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or manufacturer's instructions as specified for coating system. Hand or Power tool clean to remove all insoluble contaminants

4. Interior and exterior Exposure (moderate to severe): Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or manufacturer's instructions as specified for coating system. Follow initial cleaning with one of the following Methods:
 - a. SURFACE PREPARATION METHOD A (Preferred): Thoroughly roughen the entire surface to be coated using compressed air brush off blast cleaning with a fine abrasive to achieve a uniform anchor profile of 1-2 mils. Reference ASTM D 6386-99 (2005) Section 5.4.1.
 - b. SURFACE PREPARATION METHOD B (Alternate method when Method A is not feasible): Chemically Treat with one of the following products to etch the galvanized surface to be coated: Henkel Galvaprep 5 or Clean & Etch by Great Lakes Laboratory. Reference ASTM D 6386-99 (2005) Section 5.4.2.
- K. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime paint after repairs with Tnemec Series L69 Hi Build Epoxoline II or Carboline 890 VOC or approved in accordance with Division 01, General Requirements for Substitutions.
- L. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Spot prime bare steel surfaces to match existing primer.
- M. Wood Scheduled to Receive Paint Finish: Remove dust, grit and foreign matter. Seal knots, pitch streaks and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied.
 1. Exterior wood: apply wood preservative coats prior to paint system.
- N. Wood Doors and Cabinet Work scheduled for field-applied transparent or solid stain finish:
 1. Sand surfaces thoroughly with a 5/0, 180 grit sandpaper.
 2. Apply coatings as specified in the schedule to all surfaces, sides and edges. Avoid streaking or uneven application Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail or screw holes, or other surfaces imperfections.
 3. Stains as selected by Architect from manufacturer's full range of colors.
 4. Provide satin finish for final coats.
- O. Wood Doors Scheduled for Painting: Seal top and bottom edges with primer. Leave labels intact and readable.
- P. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent. Remove grease and dirt.
- Q. Exterior Wood-Clear coats: apply exterior grade varnish.
- R. Door and Window Frames, Side Lites, jambs and headers: clean and light sand smooth.

3.04 PROTECTION

- A. Protect elements surrounding the Work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by Work of this Section.
- C. Furnish drop cloths, shields and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.05 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply each coat to uniform finish. Number of coats specified is a minimum. Additional coats shall be applied at no extra cost, if coatings show evidence of uneven application, uneven pigmentation, brush strokes or otherwise unsatisfactory distribution of material.
- D. Under coats shall be lighter and brighter in tint than finish coat.
- E. Sand lightly between coats to achieve required finish.
- F. Allow applied coat to dry before next coat is applied.
- G. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- H. Prime back surfaces of interior and exterior woodwork with primer paint.
- I. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
- J. Seal Tops, bottoms and cutouts for hardware and accessories of wood doors and plastic-laminate covered doors.
- K. Paint Frames: Split paint door frames to match color of walls on each side of opening unless directed otherwise by Architect.
- L. Exterior and interior walls shall receive 10% accent paint colors.
- M. Exterior fascia, trims, reveals, and ornamental fences and gates shall receive accent paint colors different from field paint color.
- N. Paint finish shall continue through behind all wall-mounted items (e.g. markerboards, chalk and tack boards).

3.06 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Refer to Section Divisions 22, 23 and 26 for color coding and identification banding requirements of equipment, ductwork, piping and conduit.
- B. Paint shop primed equipment.

- C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- D. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, metal louvers, brackets, collars and supports, except where items are pre-finished.
- E. Replace identification markings on mechanical or electrical equipment when painted accidentally.
- F. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed behind louvers and grilles to match face panels.
- G. Paint exposed conduit and electrical equipment occurring in finished areas.
- H. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- I. Color code equipment, piping, conduit and exposed ductwork in accordance with requirements indicated. Color band and identify with flow arrows names and numbering, using stencils or other approved systems.
- J. Replace electrical plates, hardware, light fixture trim and fittings removed prior to finishing.

3.07 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.
- C. Collect cotton waste, cloths, and material that may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.08 FINISH SYSTEM SCHEDULE - EXTERIOR EXPOSURE

		Vista	Frazee	Dunn Edwards	Sherwin Williams	Kelly Moore
A.	Cement Plaster - Flat – 100% Acrylic					
1.	Primer, 1 Coat	4600	266	W709	A24-100	247
2.	Finish, 2 Coats	2000	203	W704V	A6	1240
B.	Ferrous - Semi Gloss – 100% Acrylic					
1.	Primer, 1 Coat	4800	561	43-5	B66	1725
2.	Tie Coat, 1 Coats	4800	124	W901-V	A82	1250
3.	Finish, 1 Coat	8400	124	W901-V	A82	1250

C. Ferrous - Factory Primed. If shop primer is compatible with finish materials, clean and touch-up prime coat in lieu of full primer coat then apply [[flat] [semi-gloss] [gloss]] acrylic paint finish as specified above.

D. Galvanized Steel and Aluminum - Flat - Acrylic

1.	Surface Prep	JASCO	JASCO	GE-123	B71Y1	JASCO
	P & P	P & P			P & P	
2.	Primer, 1 Coat	4800	561	43-7	B66W1	1725
3.	Finish, 2 Coats	2000	203	W704V	A6	1240

E. Galvanized Steel and Aluminum - Gloss – VOC Compliant

1.	Surface Prep	JASCO	JASCO	GE-123	not	JASCO
	P & P	P & P		required	P & P	
2.	Primer, 1 Coat	4800	561	43-7	B66-310	1725
3.	Finish, 2 Coats	9900	DTM 540	10Series	B54Z	1700

F. Galvanized Steel and Aluminum – Semi-Gloss – 100% Acrylic

1.	Surface Prep	JASCO	JASCO	GE-123	JASCO	JASCO
	P & P	P & P		P & P	P & P	
2.	Primer, 1 Coat	4800	561	43-7	B66-310	1725
3.	Finish, 2 Coats	8400	124	W901-V	A84W507	1250

3.09 FINISH SYSTEM SCHEDULE - INTERIOR SURFACES

A. Wood – Transparent with Stain - Non-Yellowing - Flat Lacquer

1.	Stain, 1 Coat	VWS	ZAR ST VOC V109	---	2900
2.	Sealer, 1 Coat	TC10	765	VNAS1420	4783
3.	Lacquer, 2 Coats	TC20	720	VNAF1421	4785

B. Wood - Transparent with Stain - Non-Yellowing - Semi Gloss Lacquer

1.	Stain, 1 Coat	VWS	ZAR	V109	---	2900
2.	Sealer, 1 Coat	TC10	765	VNAS1420	---	4783
3.	Lacquer, 2 Coats	TC60	725	VNAS1426	---	4784

C. Wood - Transparent with Stain - Non-Yellowing - Gloss Lacquer

1.	1 Coat, Stain	VWS	ZAR	V109	---	2900
2.	1 Coat, Sealer	VNAS1820	765	VNAS1420	---	4783
3.	2 Coats, Lacquer	VNAS1826	740	VNAS1429	---	4786

D. Wood - Stain - High Solids – Low Sheen – Lacquer

1.	Stain, 1 Coat	VWS	ZAR	V109	---	2900
2.	Sealer, 1 Coat	NAS1820	760	VNRS1620	---	4683
3.	Lacquer, 1 Coats	NAF1822	720	VNRS ???	---	4685

E. Wood - Stain - High Solids - Semi Gloss - Lacquer

1.	Stain, 1 Coat	VWS	ZAR	V109	---	2900
2.	Sealer, 1 Coat	NAS1820	760	VNRS1620	---	4683
3.	Lacquer, 2 Coats	NAF1826	723	VNRS1626	---	4684

F.	Wood - Stain Solid - Gloss - Lacquer					
1.	Stain, 1 Coat	VWS	ZAR	V109	---	2900
2.	Sealer, 1 Coat	NAS1820	760	VNRS1620	---	4683
3.	Lacquer, 2 Coats	NAF1829	740	VNRS1629	---	4686
G.	Concrete, Plaster, Masonry - Flat - Acrylic					
1.	Primer, 1 Coat	6000	066	W6232	A24W200	1505
2.	Finish, 2 Coats	6300	018	420	B5 Series	1500
H.	Concrete, Plaster, Masonry - Eggshell - Acrylic					
1.	Primer, 1 Coat	6000	066	W6232	A24W200	1505
2.	2 Coat, Finish	6300	029	W602	B9 Series	1510
I.	Gypsum Board - Eggshell - Acrylic					
1.	Primer, 1 Coat	6000	066	W101V	B11W900	1505
2.	2 Coat, Finish	6300	029	W602	B9 Series	1510
J.	Ferrous - Semi Gloss - 100% Acrylic					
1.	Primer, 1 Coat	4800	561	43-5	B66	1725
2.	Tie Coat, 1 Coat	4800	124	W901-V	B31W200	1650
3.	Finish, 1 Coat	8400	124	W901-V	B31W200	1650
K.	Ferrous - Gloss Polyurethane					
1.	Finish, 2 Coats, Dunn Edwards, Genesis Coating GCP 1000, or equal					
2.	Finish, Carbothane 134 VOC					
L.	Non-Ferrous - Gloss Polyurethane					
1.	Finish, 2 Coats, Dunn Edwards, Genesis Coating GCP 1000, or equal					
2.	Finish, Carbothane 134 VOC					
M.	Ferrous - Factory Primed. If shop primer is compatible with scheduled finish, clean and touch-up prime coat then apply [[flat] [semi-gloss] [gloss]] [[acrylic] [polyurethane]] Finish as specified above.					
N.	Galvanized and Aluminum - Semi Gloss - Acrylic					
1.	Surface Prep	JASCO	JASCO	GE123	SSPC-SP1	JASCO
	P & P	P & P			P & P	
2.	Primer, 2 Coats	4800	561	W715	B66-310	1725
3.	Finish, 2 Coats	8400	128	W7500	A88W00	1650

3.10 SPECIAL COATING SYSTEMS

- A. Exterior metal handrails, railings, guardrails, roof sheet metal flashings, [pipe bollards,] [road gates,] [ladders,] [ornamental metal fences and gates,] [galvanized structural steel,] [Architecturally Exposed Structural Steel (AESS),] [roof screens,] [trash and equipment enclosures] [exterior metal stairs,] scheduled items in Section 05 50 00, Metal Fabrications. Total 5.0 to 8.5 mil thickness, as recommended by the manufacturer:

		PPG	Tnemec	Sherwin Williams	Vista/Carboline/Rusto
B.	Unprimed or shop primed - Ferrous - Gloss – Polyurethane				
1.	Primer, 1 Coat	Amercoat 385	L69	B58-600S	Carbomastic15
2.	Finish, 2 Coats	Amershield	1080	B65-300	Carbothane 134 MC
C.	Unprimed or shop primed - Ferrous - Semi Gloss - Polyurethane				
1.	Primer, 1 Coat	Carboguard 890VOC	L69	B58-600S	S30 Griptec
2.	Finish, 2 Coats	Carbothane 134VOC	1081	B65-300	Metalmax S37DTM
D.	Galvanized or Aluminum - Gloss - Polyurethane				
1.	Primer, 1 Coat	Amerlock 400	L69	B58-600S	Galoseal WB
2.	Finish, 2 Coats	Amershield	1080	B65-300	Carbothane 134 MC
E.	Galvanized or Aluminum - Semi Gloss - Polyurethane				
1.	Primer, 1 Coat	Carboguard 890VOC	L69	B58-600S	S30 Griptec
2.	Finish, 2 Coats	Carbothane 134VOC	1081	B65-300	Metalmax S37DTM
F.	Galvanized - Gloss – Polyurethane –salt air, moisture environment				
1.	Primer, 1 Coat, 5 mils minimum DFT				
a.		Sherwin-Williams, Macropoxy 646 (B58-600 Series / B58V600 Hardener)			
b.		Vista, Galoseal WB.			
2.	Finish, 2 Coats, 7 mils minimum DFT				
a.		Sherwin-Williams, HiSolids Polyurethane (B65J-300 w/B60V30 Hardener)			
b.		Vista, Carbothane 134 MC			
G.	Unprimed Metal, Surface Preparation: SSPC-SP 3, Power Tool Cleaning				
H.	Galvanized Metal, Surface Preparation: SSPC-SP1, Solvent Wash, and etch with one of the following.				
1.	Sherwin-Williams B71Y1,				
2.	Dunn Edwards, Galva-Etch (GE 123),				
3.	JASCO Metal Etch				
4.	Or equal				
I.	Aluminum Surface Preparation: SSPC-SP1, Solvent Wash, then apply Dunn Edwards, QD 43-7, or equal.				

END OF SECTION

SECTION 16722

ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. This performance specification provides the minimum requirements for the Electronic Access Control System. The System shall include, but not be limited to all equipment, materials, software, installation, labor, documentation, training and services necessary to install a complete, operational system.
- B. Provide an addition to the existing Ingersoll Rand (IR), Schlage Electronic Access Control and Security Management System (SMS) managed by the Offices of Facilities Maintenance using IP network protocol from their offices.
- C. This system shall be an Electronic Access Control Management and Security Management System, integral in nature, such that all capabilities utilize a single, industry standard Microsoft SQL relational database management system for the storage and manipulation of related data. The system shall have the capability to provide the following services from this integral database:
 - 1. Electronic Access Control
 - 2. Alarm Management
 - 3. Dynamic Graphic Maps
 - 4. Remote Site Monitoring and Control.
 - 5. CCTV and Digital Video Recording
 - 6. Photo ID and Badging
 - 7. Management Reports
 - 8. Management of off-line Schlage CM Locks and Networked, Wireless or Wired Schlage Access Control from the same SMS Software and Database.

1.2 WORK INCLUDED

- A. The work shall include furnishing all labor, materials, tools, training, database input, assistance to the Owner for Cardholder programming, equipment, software and documentation required for a complete and fully functional Access Control and Security Management System as specified in this Section. The System shall comply in all respects with all pertinent codes, rules, regulations, and laws of the local jurisdiction.
- B. The Contractor shall provide an extension to the existing Mt. San Antonio College (Mt SAC) Schlage Security Management System (SMS), Enterprise Version with 5 Client workstation capability. The Schlage SMS Client workstation software shall be furnished and installed on Owner provided workstations at locations to be determined by Mt SAC.
- C. The Schlage SMS software shall be capable of managing and integrating the existing Schlage CM Locksets and the specified on-line electronic access control devices from within the same SMS database.

- D. The Contractor shall be responsible for all database programming and assistance to the Owner with cardholder data entry for a full and completely operational system.
- E. The Contractor shall be responsible for coordinating with Section 08710, Finish Hardware. Section 08 710 shall provide certain items of door hardware for use by the SMS, including certain power transfer hinges, power supplies for electrified panic hardware, electrified locking devices and request-to-exit switches as required. The Contractor shall be responsible for reviewing and coordinating with the Finish Hardware Section, Door Schedule, and Construction Drawings to provide a complete, functioning installation. Where Section 08710 does not provide a request-to-exit function (RX) in the hardware schedule, this Contractor shall be responsible to furnish and install a motion detector for that function, including all required low voltage power and wiring.
- F. The SMS shall manage HID compatible 125khz proximity access cards, suitable for direct-to-card printing.
- G. The SMS system shall provide free egress from access-controlled areas with no special knowledge or skill required for exiting the controlled space.
- H. The Contractor shall furnish and install a proximity card reader and a door position switch at each of the doors or gates as shown on the Construction Drawings and / or as described and specified in these documents and Section 08710.
- I. The Contractor shall integrate any door that is noted in Section 08710, that does not require a card reader but does require an electronic time schedule for automatic lock/unlock, into the system. Provide a door position switch for monitoring and a programmed time zone schedule for those doors.
- J. The Contractor shall integrate and perform all final connections for request-to-exit switches, electrified locking devices, and accessory devices provided by Section 08710 for a complete operational installation.
- K. The Contractor shall furnish and install all required power supplies for electrified locks. Section 08710 shall furnish and install all required power supplies for electrified panic hardware.
- L. The Contractor shall be a Certified Ingersoll Rand System Integrator certified to the appropriate Level for the specified system for all work required involving the Schlage SMS and it's components.
- M. The Contractor shall be responsible for all low-voltage electrical installation required for a complete and operational system. The Project Electrical Contractor shall provide any required 120 VAC wiring and conduit required for the system.

1.3 RELATED WORK

- A. General Terms and Conditions under Division 0 and 1 of the Contract Documents.
- B. Section 08710 Finish Hardware
- C. Division 16 Electrical

1.4 QUALITY ASSURANCE

- A. The equipment supplied shall be a standard labeled product of the equipment manufacturer, bearing the company name and having their exclusive model numbers. This company must be of established reputation and experience, regularly engaged in the manufacture, supply and support of

such systems. This company shall have a fully staffed office of sales and IR Certified technical support representatives within two hours travel time to the project.

1.5 REFERENCES

- A. Design and operation of the system shall conform to the following referenced codes, regulations and standards as applicable.
 - 1. National Electrical Code (NEC)
 - 2. UL 294
 - 3. FCC Rules and Regulation
 - 4. Part 15, Radio Frequency Devices
 - 5. National Electrical Manufacturers Association (NEMA)
 - 6. Section 250 Enclosures for Electrical Equipment
 - 7. Applicable Federal, State, and Local laws, regulations, and codes.

1.6 ABBREVIATIONS

- A. The following abbreviations are used in this document:
 - 1. ANSI American National Standards Institute
 - 2. ASCII American Standard Code for Information Interchange
 - 3. AWG American Wire Gauge
 - 4. FCC Federal Communications Commission
 - 5. IEEE Institute of Electrical Code
 - 6. NEC National Electrical Code
 - 7. NEMA National Electrical Manufacturers Association
 - 8. SMS Security Management System
 - 9. UL Underwriters' Laboratories

1.7 RESPONSE TO SPECIFICATION

- A. The Contractor shall submit a point-by-point statement of compliance with all relevant sections defined herein. Where the proposed system complies fully with all numbered paragraphs as written, such shall be indicated by placing the statement "fully complies, plans and specifications complete" on the statement of compliance.
- B. Where the proposed system does not comply with the paragraph as written, but the Contractor feels they will accomplish the intent of the paragraph in a manner different from that described, a full description of the intent perceived by the Contractor shall be provided as well as a full description of how the proposal will meet its perceived intent.
- C. Where a full description is not provided, it shall be assumed that the proposed system does not comply with the paragraph in question.
- D. Documentation in support of substitute equipment shall qualify all parameters with tangible values and benefit to Mt. San Antonio College in the response notations or on the manufacturer's original data sheets. Submissions documents not using this type of statement shall be considered non-compliant.

1.8 SUBMITTALS

- A. Contractor shall submit all items in accordance with the requirements of Section 01300, "Submittal Procedures", and shall include, but not be limited to the following:
 - 1. Model numbers of all components furnished on the job.
 - 2. Manufacturer's catalog data sheets for all components.
 - 3. Input power requirements for all components.
 - 4. Complete engineered drawings indicating:
 - a. Manufacturer model numbers and specifications.
 - b. Dimensions, layouts, installation details.
 - c. Point-to-point wiring diagrams for all devices.
- B. Single-line system architectural drawings representing the entire system.
- C. Mt SAC acceptance form with a check box associated with each card reader and input point to indicate that each point was checked off as properly installed and reporting back to the control panel and the host computer prior to Owner acceptance of the system.
- D. Two (2) sets of the Manufacturer's User's Manuals and Installation Manuals.

PART 2 - PRODUCTS

2.1 SUMMARY

- A. The Schlage Security Management System (SMS) shall be capable of integrating multiple building functions including access control, alarm management, intrusion detection, CCTV and digital video recording, and Photo ID badging.
- B. The system shall be at the time of bid, listed by Underwriters Laboratories for UL 294 Access Control Systems. Unlisted systems are unacceptable. All control panels furnished on the job shall carry the UL 294 labels.
- C. The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of control panels, card readers, and sensors.

2.2 OPERATIONAL REQUIREMENTS

- A. Scope of Work
 - 1. General
 - a. All Schlage SMS software required to provide the specified system functions currently is installed on the Campus.
 - b. Furnish and install the latest revision of Schlage SMS Client Software, as required.
 - c. The Contractor shall furnish and install Client Workstation Software on Owner provided Workstations, at locations determined by Mt SAC.

2. Database Management: The system shall create and maintain a master database of all cardholder records and all system activity for all connected points.
3. Audit Trail: The system shall maintain an audit trail file of operator activity. Provide the ability to generate a report by operator, time and data, and type of activity (audit code). The system shall allow the operator to direct the audit trail report to screen, printer, or file.
4. Input point monitoring: Collect and process status information from all monitored points.
5. Alarm annunciation: Audibly and visually annunciate all alarm, tamper and trouble conditions, and advisories.
6. Input point supervision: The system shall electrically supervise all 2-state and 4-state input point circuits as specified or shown on the drawings.
7. Reports: The Schlage SMS shall be equipped with a fully integrated, dynamic report writer module that shall have access to the SMS database fields to allow users to create custom reports without the need for computer programming skills. The Schlage SMS shall be provided with a complete library of standard reports.
8. On-line help system: The system shall provide on-line, context sensitive help that shall be available at anytime and from any screen.
9. Passwords: The operator password function shall control which menu items and cardholder database fields that the individual operator may access. It shall be possible to restrict access to individual cardholder database fields such that certain operators may view and edit individual fields while other operators may only view the fields. It shall also be possible to restrict password holders such that certain specified fields and/or menu commands do not appear on the screen, or are grayed-out (disabled) for a given password.
10. Alarm Input Point Reporting Delay: The system shall allow the operator to apply an input point reporting delay period from 0 – 60 seconds for each input point terminal. The default setting for each input point reporting delay shall be 0 seconds.
11. Alarm Input Point Suppression: The system shall provide an alarm input point suppression facility such that the operator may define a time zone suppression period for each individual input point. Alarm conditions for suppressed input points shall not be recorded or archived by the system.
12. Event Processing:

A. Time Zones:

1. The SMS shall provide the capability for the user to define time zones with the following identification and configuration parameters.
 - a. Name
 - b. Description
 - c. Allowance for any number of time zone periods, during each day of the week and each of the different holiday types.
 - d. Any number of days of the year may be designated as a holiday, each defined as one of any holiday types.

B. Communications:

1. Should the controller lose communications with the Host Server or Network, the controllers shall continue to control access and monitor inputs for all connected points. Local history of all transactions shall be buffered at the controller and automatically uploaded to the Schlage SMS Server for alarm reporting and long-term historical storage once communications are re-established.

2. In the event of a total failure of the controller, the connected card readers shall continue to operate and make access control decisions based on a common facility code encoded in each access control card for the given facility.
3. User defined cardholder database fields: The system shall support unlimited user defined data fields that may be used to store information for each cardholder. The SMS shall provide standard menu items that shall allow the operator to define these cardholder database field at anytime. The system shall remain on-line while user defined cardholder database fields are added or edited. It shall be possible, using standard SMS system menu commands to search and report on all user defined cardholder fields.
4. Event and Transaction History: The SMS shall maintain a record of all alarm, card transaction, and system exceptions which take place, and provide a means for a user to access this information. It shall be possible to print information in the log in real-time or by a report.
5. Anti-Passback Control: The SMS shall provide the capability to prevent more than one person from gaining access to a controlled area by recognizing when a cardholder who is granted access is passing back the card to another person to use the same card to gain access. An alarm shall be generated if the cardholder violates the anti-passback rules. It shall be possible to define on a reader-by-reader basis, which readers are subject to anti-passback rules.
6. Entry/Exit Control: The SMS shall provide the capability to control a card's entry into or exit from an area based on the cards previous transaction status.
7. Cardholder Definition: The SMS shall provide the capability for the user to define Cardholders with the following identification and operating parameters.
 - a. Cardholders name (first, middle, last)
 - b. Cardholders address
 - c. Cardholder phone number.
 - d. Activation period using start and end dates
 - e. Trace enabled or disabled
 - f. PIN code
 - g. Assigned access cards.
 - h. Unlimited user defined cardholder fields. The SMS shall provide the capability to use these fields in filtering reports.
8. System Status Display: The SMS shall provide a dynamic system status summary display that graphically indicates the status information filtered by communications loop, controller, or Workstation. All status display information shall be summarized in a single window.
9. Alarm routing: The SMS shall provide the ability for the user to define which input points or groups of input points are routed to each SMS Operator Workstation (WS) computer. The system shall provide a report showing which input points are routed to each WS.
10. Control points: The SMS shall provide the ability to define input points as control points to be used in input/output linking and event processing sequences of operation. Control points shall not enter the alarm queue and shall not require that an operator acknowledge them when they change state. The control point activity will however, be automatically logged to the history file.

2.3 SOFTWARE REQUIREMENTS

- A. The Client WS operating system shall be Microsoft Windows 2000 or XP Professional software.
 - 1. The SMS software features shall be fully documented in the form of a complete user's manual including operation and installation sections, and a detailed description of the major SMS functions.
 - 2. The Contractor shall load SMS Client software on Owner provided workstations as directed by the Office of Facilities Maintenance.

2.4 INTEGRATION REQUIREMENTS

- A. The card access system must be compatible with off-line, battery-powered Schlage CM Locks, Schlage Wireless Access Modular Locksets, Schlage VIP Locksets and hardwired, networked Schlage and HID compatible card readers, all managed from a common SMS database.

2.5 HARDWARE REQUIREMENTS

- A. Controllers shall be IR Schlage-SRCNX Access Controller with SRINX reader interfaces as required.
 - 1. The Controller shall be a fully stand-alone processor capable of making all access control decisions without the involvement of the host computer.
 - 2. The Controller shall support up to sixteen (16) card readers in addition to auxiliary input points and output points.
 - 3. Memory Requirements:
 - a. Minimum number of cards: 20,000.
 - b. Minimum number of historical transactions: 10,000.
 - c. The controller(s) shall be provided with an IP-Addressable module to connect to the Mt SAC Campus network for communication. A network drop for Controller connection to the system shall be provided for the Contractor at the designed location for installation of the Controller. Schlage Part No. SIPNX-100 IP Addressable Module.
 - d. Each controller shall be provided with built-in hardware to support hardwired data communications between the controller(s) and the host of up to 4,000 feet per segment.
 - e. An alarm summary relay shall be built-in to the controller motherboard. The alarm relay shall be activated whenever a connected alarm point transfers to the alarm state and whenever soft alarms become active.
 - f. A SPDT tamper switch shall be attached to the inner surface of the controller enclosure. The tamper switch shall change state whenever the enclosure door is opened to signal the SMS of the condition. The tamper switch input shall be user programmable to be suppressed, to be recognized as an input point to be processed by the alarm queue at the host computer.
 - g. The standard AC linear power supply version of the controller shall include a battery module to back-up the controller's applications programs and database upon the failure of the primary AC power service. Additionally, the Contractor shall provide a minimum of four (4) hours of stand-by battery operation for the controller.

- h. The controller shall provide built-in LED's that indicate whether or not the controller is continuing to process event activity, card transactions, and record history transactions.
- i. Provide the controllers and associated accessory devices, in sufficient quantities to manage all card readers and monitoring inputs required for the project.
- j. Controllers shall be mounted in designated building IDF/Communication Rooms.

B. Card Readers

1. General

- a. All card access controlled doors shall be configured with a proximity card reader or access control device at each door as shown or described within the Construction Documents. Refer to Section 08710 and the Construction Drawings for details and door locations.

C. Proximity Technology Card Readers

- 1. Proximity technology card readers shall be HID compatible, operate at 125 KHZ and 13.56 MHz, with a read-range of 2"-4" on center and shall be manufacturer certified for an ambient operating environment of -22 to 150 deg. F and 0 to 95% RH, non-condensing
- 2. The reader shall contain a tri-color (amber, green, and red), LED to indicate valid and invalid card reads, audible status alert and shall be weatherized for outdoor use.
- 3. Furnish and install the proximity card readers in the style of hardwired, mullion design for narrow stile glass doors or any door requiring a narrow stile design, and hardwired wall mount form factor for all other doors. Model: Schlage SFX1100 Multi-Technology Mullion Reader, Schlage SXF1500 Multi-Technology Wall Mount Reader or equal.
- 4. The Contractor shall furnish and install low voltage power for all electrified locks provided by Section 08710. Power supplies for electrified panic hardware shall be furnished by Section 08710. Lock power supplies shall be sized to power all electrified locks. Power supplies shall be as manufactured by Schlage Electronic, Altronix, or equal.
- 5. The Contractor shall provide (100) HID ISO Prox II proximity cards or equal. Cards shall be allow for direct to card printing and shall be suitable for use as an ID Badge.
- 6. The Contractor shall furnish and install a door position switch for all card reader controlled doors. Part No. Schlage Electronic 7764 Series or equal.

2.6 DELIVERY, STORAGE AND HANDLING

- A. SMS components shall be shipped to the job-site in original manufacturer's shipping containers.
- B. All shipping and handling costs shall be paid for by the Contractor.
- C. All equipment stored on the job site shall be secured in a locked storage area as designated by the Contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All electronic equipment, terminals, and controllers shall be factory wired prior to shipment to the jobsite.
- B. The Project Electrical Contractor shall provide all required conduit and 120 VAC for the system.
- C. All exposed wiring within the cabinets, consoles, and terminals shall be formed neatly with wires grouped in bundles using non-metallic, flame-resistant wiring cleats or wire ties.

3.2 TESTING AND COMMISSIONING

- A. The Contractor shall be responsible for testing and commissioning of the installation in accordance with all applicable documents in the Contract set.
 - 1. Testing shall be comprehensive and sufficient to demonstrate compliance with each requirement.
 - 2. A proposed test plan shall be submitted to Mt SAC for approval prior to commencement of final test.
- B. Final Tests shall be conducted in the presence of the Contractor and the Owner's Administration and Facilities personnel.

3.3 TRAINING AND INSTRUCTION

- A. SMS Operator Training shall have previously been performed for the Mt SAC Staff, on-site by a factory trained instructor.
- B. Additional equipment and training sessions shall be made available to the Owner, if necessary, at additional cost.

3.4 WARRANTY

- A. All equipment furnished under this contract shall be warranted for a period of twelve (12) months from the date of final acceptance of the system. The warranty shall include all material, labor, and travel expenses to:
 - 1. Respond to service requests on-site, within 24 hours.
 - 2. Replace or repair defective components as required.

END OF SECTION

SECTION 23 08 00

HVAC SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The purpose of this Section is to specify responsibilities of this Division 23 in the commissioning process. All contractors under this division shall be referred to as HVAC contractor and shall be responsible to coordinate under Division 01 91 13
- B. The systems to be commissioned are listed in Division 01, Section 01 91 13 Commissioning General Requirements including
 1. Chilled water system, pumps, piping, primary chilled water connections, valves and miscellaneous controls.
 2. Heating hot water system, pumps, piping, valves and miscellaneous controls.
 3. Air handler systems including VAV terminals.
 4. Split air conditioning systems
 5. Duct distribution systems and diffusers
 6. Exhaust fan systems
 7. Underground HVAC piping systems.
 8. Aboveground HVAC piping system.
 9. HVAC ductwork system.
 10. BAS temperature sensors, CO₂ sensors, pressure sensors and controllers
 11. BAS graphical user interface.
 12. BAS airflow stations
 13. BAS damper and valve actuators
 14. BAS network communications and interface
- C. Commissioning requires the participation of this Division to ensure that all systems are operating in a manner consistent with the Contract Documents. The general commissioning requirements and coordination are detailed in Division 01. Division 23 shall be familiar with all parts of Division 01 commissioning and the commissioning plan issued by the CxA and shall execute all commissioning responsibilities assigned to them in the Contract Documents.

1.02 RESPONSIBILITIES

- A. HVAC, Controls and TAB Contractors: The commissioning responsibilities applicable to each of the HVAC, controls and TAB contractors of this Division are as follows (all references apply to commissioned equipment only)
 1. Include the costs associated with support and labor of CxA for commissioning in the contract price.
 2. In each purchase order or subcontract written, include wording to indicate cost for supporting documentation and labor for the commissioning process including data, commissioning documentation, O&M data and training.

3. Attend a commissioning scoping meeting and other meetings necessary to facilitate the Cx process.
4. Contractors shall provide the CxA with normal cut sheets and shop drawing submittals, and narrative of commissioned equipment.
5. Provide additional requested documentation, at time of normal O&M manual submittals, to the CxA for development of start-up and functional testing procedures.
 - a. Typically this will include detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, full details of any Owner-contracted tests, fan and pump curves, full factory testing reports, if any, and full warranty information, including all responsibilities of the Owner to keep the warranty in force clearly identified. In addition, the installation, start-up and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the CxA.
 - b. The CxA may request further documentation necessary for the commissioning process as described in the contract documents.
 - c. This data request may be made prior to normal submittals.
6. Provide a copy of the O&M manuals and submittals of commissioned equipment, through normal channels, to the CxA for review and approval.
7. Contractors shall assist (along with the design engineers) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
8. Provide limited assistance to the CxA in preparing the specific functional performance test procedures as specified in the draft Construction Phase Commissioning Plan. Subs shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written time schedules, set-points, and alarm limits to be used during the tests.
9. Develop a full start-up and initial checkout plan using manufacturer's start-up procedures and the prefunctional checklists from the CxA for all commissioned equipment. Submit to CxA for review and approval prior to startup. Refer to Division 01 for further details on start-up plan preparation.
10. During the startup and initial checkout process, execute the HVAC-related portions of the prefunctional checklists for all commissioned equipment.
11. Perform and clearly document all completed startup and system operational checkout procedures, providing a copy to the CxA.
12. Address current Construction Observer punch list items before functional testing. Air and water TAB shall be completed with discrepancies and problems remedied before functional testing of the respective air- or water-related systems.
13. Provide skilled technicians to execute starting of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
14. Perform functional performance testing under the direction of the CxA for specified equipment in Construction Phase Commissioning Plan. Assist the CxA in interpreting the monitoring data, as necessary.
15. Correct deficiencies (differences between specified and observed performance) as interpreted by the CxA and A/E and retest the equipment.

16. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
 17. Prepare red-line as-built drawings for all drawings and final as-built documents for contractor-generated coordination drawings.
 18. Provide a written training plan and training of the Owner's operating personnel as specified.
 19. Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.
 20. Execute seasonal or deferred functional performance testing, witnessed by the CxA, according to the specifications.
 21. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.
- B. HVAC Contractor: The responsibilities of the HVAC contractor, during construction and acceptance phases in addition to those listed in (A) are
1. Provide startup for all HVAC equipment, except for the building automation control system.
 2. Assist and cooperate with the TAB contractor and CxA by
 - a. Putting all HVAC equipment and systems into operation and continuing the operation during each working day of TAB and commissioning, as required.
 - b. Including cost of sheaves and belts that may be required by TAB.
 - c. Providing test holes in ducts and plenums for each control sensor and where directed by TAB to allow air measurements and air balancing. Providing an approved plug.
 - d. Providing temperature and pressure taps according to the Construction Documents for TAB and commissioning testing.
 3. Install a P/T plug at each water sensor which is an input point to the control system.
 4. List and clearly identify on the as-built drawings the locations of all air-flow stations.
 5. Prepare a preliminary schedule for Division 015 pipe and duct system testing, flushing and cleaning, equipment start-up and TAB start and completion for use by the CxA. Update the schedule as appropriate.
 6. Notify the GC or CxA depending on protocol, when pipe and duct system testing, flushing, cleaning, startup of each piece of equipment and TAB will occur. Be responsible to notify the GC or CxA, ahead of time, when commissioning activities not yet performed or not yet scheduled will delay construction. Be proactive in seeing that commissioning processes are executed and that the CxA has the scheduling information needed to efficiently execute the commissioning process.

- C. Controls Contractor: The commissioning responsibilities of the controls contractor, during construction and acceptance phases in addition to those listed in (A) are
1. Sequences of Operation Submittals: The Controls Contractor's submittals of control drawings shall include complete detailed narrative of the sequences of operation for each piece of equipment, regardless of the completeness and clarity of the sequences in the specifications. If clarity from the Engineer is required for completion of the following requirements, the Controls Contractor shall submit requests for information (RFI) to gain sufficient information to complete the following requirements
 - a. An overview narrative of each major system (1 or 2 paragraphs) generally describing its purpose, components and function.
 - b. All interactions and interlocks with other systems.
 - c. Detailed delineation of control between any packaged controls and the building automation system, listing what points the BAS monitors only and what BAS points are control points and are adjustable.
 - d. Written sequences of control for packaged controlled equipment. (Equipment manufacturers' stock sequences may be included, but will generally require additional narrative).
 - e. Provide detailed sequences for all control strategies, e.g., economizer control, optimum start/stop, staging, optimization, demand limiting, etc.
 - f. The sequences shall include (as applicable) start-up, warm-up mode, normal operating mode, unoccupied mode sequences, shutdown sequences, failure modes, capacity control sequences and equipment staging and temperature and pressure control: setbacks, setups, resets, etc., effects of power or equipment failure with all standby component functions, all alarms and emergency shut downs, and seasonal operational differences and recommendations.
 - g. Provide initial and recommended values for all adjustable settings, setpoints and parameters that are typically set or adjusted by operating staff; and any other control settings or fixed values, delays, etc. that will be useful during testing and operating the equipment.
 - h. All sequences shall be written in small statements, each with a number for reference. For a given system, numbers will not repeat for different sequence sections, unless the sections are numbered.
 2. Control Drawings Submittal
 - a. The control drawings shall have a key to all abbreviations.
 - b. The control drawings shall contain graphic schematic depictions of the systems and each component and shall match the system graphic screens in every detail.
 - c. The schematics will include the system and component layout of any equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.
 - d. Provide a full points list with at least the following included for each point
 - 1) Controlled system
 - 2) Point abbreviation
 - 3) Point description: (DB temp, airflow, etc.)
 - 4) Display unit

- 5) Control point or setpoint: (Point that controls equipment and can have its setpoint changed (OSA, SAT, etc.)
 - 6) Monitoring Point: (Point that does not control or contribute to the control of equipment, but is used for operation, maintenance, or performance verification.)
 - 7) Intermediate Point: (Point whose value is used to make a calculation which then controls equipment (space temperatures that are averaged to a virtual point to control reset)).
 - 8) Calculated Point: ("Virtual" point generated from calculations of other point values.)
- e. The Controls Contractor shall keep the CxA informed of all changes to this list during programming and setup.
3. An updated as-built version of the control drawings and sequences of operation shall be included in the final controls O&M manual submittal.
 4. The controls contractor shall provide a signed and dated certification to the CxA and GC upon completion of the pre-functional checkout of each controlled device, sensor, actuator, valve, safety, switch, relay, starter or other control equipment and system prior to any functional testing for each piece of equipment or system, that all system programming and computer graphical screens is complete as to all respects of the Contract Documents, except functional testing requirements.
 5. Make available printouts of hourly samples and time stamp of at least 144 hours prior to functional testing a stored data base from the BMS. Pre-program and set up system to automatically store control system data from sensors and controlled devices trend logs for the following:
 - a. All AHU systems sensors, on/off status, valve and damper position.
 - b. Chilled Water and Heating Hot Water Supply and Return Temperatures and Pressures.
 - c. Preheat coil discharge temperatures and valve position vs time. 1 minute intervals.
 - d. All Room temperatures and humidity sensors 1 minute intervals.
 - e. Outside ambient temperature.
 - f. Building pressures.
 6. Assist and cooperate with the TAB contractor in the following manner
 - a. Meet with the TAB contractor prior to beginning TAB and review the TAB plan to determine the capabilities of the control system toward completing TAB. Provide the TAB any needed unique instruments for setting terminal unit boxes and instruct TAB in their use (handheld control system interface for use around the building during TAB, etc.).
 - b. For a given area, have all required prefunctional checklists, calibrations, startup and selected functional tests of the system completed and approved by the CxA prior to TAB.
 - c. Provide a qualified technician to operate the controls to assist the TAB contractor in performing TAB, or provide sufficient training for TAB to operate the system without assistance.
 7. Assist and cooperate with the CxA in the execution of the functional testing of the controls system, HVAC equipment, and electrically controlled equipment and trend logs as specified in the Construction Phase Commissioning Plan.

8. List and clearly identify on the as-built duct and piping drawings the locations of all temperature, static and differential pressure sensors (air, water and building pressure).
- D. TAB Contractor: The duties of the TAB contractor, in addition to those listed above are:
1. Six weeks prior to starting TAB, submit to the GC the qualifications of the site technician for the project, including the name of the contractors and facility managers of recent projects the technician on which was lead. The Owner will approve the site technician's qualifications for this project.
 2. Submit the outline of the TAB plan and approach for each system and component to the CxA, GC and the controls contractor six weeks prior to starting the TAB. This plan will be developed after the TAB has some familiarity with the control system.
 3. The submitted plan will include
 - a. Certification that the TAB contractor has reviewed the construction documents and the systems with the design engineers and contractors to sufficiently understand the design intent for each system.
 - b. An explanation of the intended use of the building control system. The controls contractor will comment on feasibility of the plan.
 - c. All field checkout sheets and logs to be used that list each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - d. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
 - e. Final test report forms to be used.
 - f. Detailed step-by-step procedures for TAB work for each system and issue: terminal flow calibration (for each terminal type), diffuser proportioning, branch / sub-main proportioning, total flow calculations, rechecking, diversity issues, expected problems and solutions, etc. Criteria for using air flow straighteners or relocating flow stations and sensors will be discussed. Provide the analogous explanations for the water side.
 - g. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - h. Details of how total flow will be determined (Air: sum of terminal flows via BAS calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations. Water: pump curves, circuit setter, flow station, ultrasonic, etc.).
 - i. The identification and types of measurement instruments to be used and their most recent calibration date.
 - j. Specific procedures that will ensure that both air and water side are operating at the lowest possible pressures and provide methods to verify this.
 - k. Confirmation that TAB understands the outside air ventilation criteria under all conditions.
 - l. Details of whether and how minimum outside air cfm will be verified and set and for what level (total building, zone, etc.).
 - m. Details of how building static and exhaust fan / relief damper capacity will be checked.

- n. Proposed selection points for any specified sound measurements and sound measurement methods.
 - o. Details of methods for making any specified coil or other system plant capacity measurements.
 - p. Details of any TAB work to be done in phases (by floor, etc.), or of areas to be built out later.
 - q. Details regarding specified deferred or seasonal TAB work.
 - r. Details of any specified false loading of systems to complete TAB work.
 - s. Details of all exhaust fan balancing and capacity verifications, including any required room pressure differentials.
 - t. Details of any required interstitial cavity differential pressure measurements and calculations.
 - u. Plan for hand-written field technician logs of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests (scope and frequency).
 - v. Plan for formal progress reports (scope and frequency).
 - w. Plan for formal deficiency reports (scope, frequency and distribution).
4. A running log of events and issues shall be kept by the TAB field technicians. Submit hand-written reports of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests to the CxA and GC at least twice a week.
 5. Communicate in writing to the controls contractor all setpoint and parameter changes made or problems and discrepancies identified during TAB which affect the control system setup and operation.
 6. Provide a draft TAB report within two weeks of completion. A copy will be provided to the CxA. The report will contain a full explanation of the methodology, assumptions and the results in a clear format with designations of all uncommon abbreviations and column headings. The report should follow the latest and most rigorous reporting recommendations by AABC, NEBB or ASHRAE Standard 111.
 7. Provide the CxA with any requested data, gathered, but not shown on the draft reports.
 8. Provide a final TAB report for the CxA with details, as in the draft.
 9. Conduct functional performance tests and checks on the original TAB as specified for TAB in the Construction Phase Commissioning Plan.

PART 2 - PRODUCTS

2.01 TEST EQUIPMENT

- A. Division 23 shall provide all test equipment necessary to fulfill the testing requirements of this Division.
- B. Refer to Section 01 91 13 for additional Division 23 requirements.

PART 3 - EXECUTION

3.01 SUBMITTALS

- A. This Division shall provide submittal documentation relative to commissioning as required in Division 01.

3.02 STARTUP

- A. The HVAC and controls contractors shall follow the start-up and initial checkout procedures listed in the Responsibilities list in this section and in Division 01. This Division has start-up responsibility and is required to complete systems and sub-systems so they are fully functional, meeting the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve or lessen this responsibility or shift that responsibility partially to the commissioning Authority or Owner.
- B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems or sub-systems at the discretion of the CxA and GC. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all prefunctional checklists as soon as possible.

3.03 OPERATION AND MAINTENANCE (O&M) MANUALS

- A. The following O&M manual requirements do not replace O&M manual documentation requirements elsewhere in these specifications. See also systems manual Section 01 91 13.
 - 1. This Division shall compile and prepare documentation for all equipment and systems covered in this Division and deliver this documentation to the GC for inclusion in the O&M manuals, according to this section and Section 01 91 13, prior to the training of Owner personnel.
 - 2. The CxA shall receive a copy of the O&M manuals for review.
- B. Systems Concepts and Operations Manual that consists of the following: Owner Objectives (by owner); Design Narrative and Basis of Design (by designer); Performance metrics, if completed during design; space and use descriptions, single line drawings and schematics for major systems (by designer); control drawings, sequences of control (by contractor); and a table of all set points and implications when changing them, schedules, instructions for operation of each piece of equipment for emergencies, seasonal adjustment, startup and shutdown, instructions for energy savings operations and descriptions of the energy savings strategies in the facility, recommendations for re-commissioning frequency by equipment type, energy tracking recommendations, and recommended standard trend logs with a brief description of what to look for in them (all by (CP)).

- C. Control System O&M Manual Requirements: As part of the control system documentation that is specified elsewhere, the contractor shall compile and organize at minimum the following data on the control system in electronic format and a labeled 3-ring binder(s) with indexed tabs.
1. Three copies of the controls training manuals in a separate bound manual from the O&M manuals.
 2. Operation and Maintenance Manuals containing:
 - a. Specific instructions on how to perform and apply all functions, features, modes, etc. mentioned in the controls training sections of this specification and other features of this system. These instructions shall be step-by-step. Indexes and clear tables of contents shall be included. The detailed technical manual for programming and customizing control loops and algorithms shall be included.
 - b. Full as-built set of control drawings (refer to Submittal section above for details).
 - c. Full as-built sequence of operations for each piece of equipment.
 - d. Full points list. In addition to the updated points list required in the original submittals (Part 1 of this section), a listing of all rooms shall be provided with the following information for each room
 - 1) Floor
 - 2) Room number
 - 3) Room name
 - 4) Air handler unit ID
 - 5) Fan coil unit ID
 - 6) Split A/C system units ID
 - 7) Air handler unit ID
 - 8) Exhaust fans ID
 - 9) Chemical treatment
 - 10) Dirt separator
 - 11) Hot Water Pumps
 - 12) Reference drawing number
 - 13) Boiler tag ID
 - 14) VAV terminals ID
 - 15) Expansion tanks ID
 - 16) Control panels ID
 - 17) Heating and/or cooling valve tag ID
 - 18) Minimum cfm
 - 19) Maximum cfm
 - e. Full print out of all schedules and set points after testing and acceptance of the system.
 - f. Full as-built print out of software program.
 - g. Electronic copy on disk of the entire program for this facility.
 - h. Marking of all system sensors and thermostats on the as-built floor plan and HVAC drawings with their control system designations.
 - i. Maintenance instructions, including sensor calibration requirements and methods by sensor type, etc.
 - j. Control equipment component submittals, parts lists, etc.
 - k. Warranty requirements.

- l. Copies of all checkout tests and calibrations performed by the Contractor (not commissioning tests).
 3. The manual shall be organized by major system and subdivided with permanently labeled tabs for each of the following data in the given order
 - a. Sequences of operation
 - b. Control drawings
 - c. Points lists
 - d. Controller / module data
 - e. Thermostats and timers
 - f. Sensors and DP switches
 - g. Valves and valve actuators
 - h. Dampers and damper actuators
 - i. Program setups (software program printouts)
 4. Field checkout sheets and trend logs should be provided to the CxA for inclusion in the Commissioning Record Book.
- D. Special TAB Documentation Requirements: The TAB shall compile and submit the following with other documentation that may be specified elsewhere in the Specifications.
 1. Final report containing an explanation of the methodology, assumptions, test conditions and the results in a clear format with designations of all uncommon abbreviations and column headings.
 2. The TAB shall mark on the drawings where all traverse and other critical measurements were taken and cross reference the location in the TAB report.
- E. Review and Approvals: Review of the commissioning related sections of the O&M manuals shall be made by the A/E and by the CxA. Refer to Division 01.

3.04 TRAINING OF OWNER PERSONNEL

- A. The contractor shall be responsible for a training plan of commissioned systems and training coordination and scheduling, ultimately to ensure that training is completed. Refer to Division 01 for additional details.
- B. The CxA shall be responsible for overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment. Refer to Division 01 for additional details.
- C. Training Manuals: The standard operating manual for the system and any special training manuals will be provided for each trainee, with three extra copies left for the O&M manuals. In addition, copies of the system technical manual will be demonstrated during training and three copies submitted with the O&M manuals. Manuals shall include detailed description of the subject matter for each session. The manuals will cover all control sequences and have a definitions section that fully describes all relevant words used in the manuals and in all software displays. Manuals will be approved by the CxA. Copies of audiovisuals shall be delivered to the Owner.

- D. HVAC Contractor: The HVAC contractor shall have the following training responsibilities
1. Provide the CxA with a training plan as part of the submittals and before any planned training according to the outline described in Section 01 91 13.
 2. Provide designated Owner personnel with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of HVAC equipment including, but not limited to, pumps, boilers, furnaces, chillers, heat rejection equipment, air conditioning units, air handling units, fans, terminal units, controls and water treatment systems, etc.
 3. Training shall normally start with classroom sessions followed by hands-on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
 4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
 5. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment is required. More than one party may be required to execute the training.
 6. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
 7. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
 8. Training shall include
 - a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.
 - b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
 - c. Discussion of relevant health and safety issues and concerns.
 - d. Discussion of warranties and guarantees.
 - e. Common troubleshooting problems and solutions.
 - f. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
 - g. Discussion of any peculiarities of equipment installation or operation.
 - h. The format and training agenda in "The HVAC Commissioning Process, ASHRAE Guideline 0" is recommended.
 - i. Classroom sessions shall include the use of overhead projections, slides, video/audio-taped material as might be appropriate.
 9. Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance for all pieces of equipment.

10. The HVAC contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.
 11. Training shall occur after functional testing is complete, unless approved otherwise by the Project Manager.
- E. Controls Contractor: The controls contractor shall have the following training responsibilities
1. Provide the CxA with a training plan four weeks before the planned training.
 2. The controls contractor shall provide designated Owner personnel training on the control system in this facility. The intent is to clearly and completely instruct the Owner on all the capabilities of the control system.
 3. The trainings will be tailored to the needs and skill-level of the trainees.
 4. The trainers will be knowledgeable on the system and its use in buildings. For the on-site sessions, the most qualified trainer(s) will be used. The Owner shall approve the instructor prior to scheduling the training.
 5. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
 6. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.

3.05 DEFERRED TESTING

- A. Unforeseen Deferred Tests: If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the PM. These tests will be conducted in the same manner as the seasonal tests as soon as possible. Services of necessary parties will be negotiated.
- B. Seasonal Testing: During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CA shall coordinate this activity. Tests shall be executed, documented and deficiencies corrected by the appropriate Subs, with facilities staff and the CA witnessing. Any final adjustments to the O&M manuals and as-builds due to the testing will be made.

END OF SECTION

SECTION 26 08 01

ELECTRICAL SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The purpose of this section is to specify the Contractors responsibilities and participation in the commissioning process relative to Division 26.
- B. Commissioning is primarily the responsibility of the commissioning agent, with support for start-up, testing, and commissioning responsibility of Division 26. The commissioning process does not relieve the Contractor from participation in the process or diminish the role and obligations of the Contractor to complete all portions of work in a satisfactory and fully operational manner.
- C. Work of Division 26 includes
 - 1. Testing and start-up of the electrical equipment.
 - 2. Providing qualified personnel to assist in commissioning tests, including seasonal testing required after the initial commissioning.
 - 3. Providing equipment, materials, and labor necessary to correct deficiencies found during the commissioning process which fulfill contract and warranty requirements.
 - 4. Completion and endorsement of pre-functional test checklists provided by the Commissioning agent to assure that Division 26 equipment and systems are fully operational and ready for functional testing.
 - 5. Providing operation and maintenance information and as-built drawings to the Commissioning agent for review verification and organization, prior to distribution.
 - 6. Providing assistance to the Commissioning agent to develop, edit, and document system operation descriptions.
 - 7. Providing training for the systems specified in this Division with coordination by the Commissioning agent.

1.2 RELATED WORK

- A. All testing and start-up procedures and documentation requirements specified within Division 26.
- B. Section 26 05 00 – Common Work Results for Electrical
- C. Section 26 08 00 – Electrical Systems Commissioning
- D. Section 26 09 13 – Electrical Power Monitoring and Control
- E. Section 26 09 23 – Lighting Control Devices

- F. Section 26 29 23 – Variable Frequency Motor Controllers
- G. Section 26 51 00 – Interior Lighting
- H. Section 26 56 00 – Exterior Lighting
- I. Commissioning functional test procedures that require participation of the Contractors.
 - 1. Cooperate with the Commissioning agent in the following manner: Allow sufficient time before final completion dates so that test and balance and commissioning testing can be accomplished.
 - 2. Provide labor and material to make corrections when required without undue delay.
 - 3. Put all heating, ventilating, and air conditioning systems and equipment into full operation and continue the operation of the same during each working day of commissioning.
- J. For specified electrical systems and component testing by a third-party testing Contractor, coordinate with the commissioning agent, the scope and schedule of that testing for observation by the commissioning agent during the actual testing.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Standard test equipment for commissioning will be provided by the commissioning agent.
- B. Proprietary test equipment required by the manufacturer, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist the commissioning agent in the commissioning process.

PART 3 - EXECUTION

3.1 WORK PRIOR TO COMMISSIONING

- A. Complete all phases of work so the systems can be energized, started, tested, and otherwise commissioned. Division 26 has primary start-up responsibilities with obligations to complete systems, including all sub-systems so they are functional. This includes the complete installation of all equipment, materials, raceways, wire, terminations, controls, etc., per the Contract Documents and related directives, clarifications, change orders, etc.

- B. A Commissioning Plan will be developed by the Commissioning agent. Upon request of the Commissioning agent, the Contractor shall provide assistance and consultation. The Commissioning Plan will be developed prior to completion of the installation. The Contractor is obligated to assist the Commissioning agent in preparing the Commissioning Plan by providing all necessary information pertaining to the actual equipment and installation. If system modifications/clarifications are incorporated to this and related sections of work, commissioning of this work will be made at no additional cost to the Owner. If Contractor-initiated system changes have been made that alter the commissioning process, the Commissioning agent will notify the Architect, and the Contractor may be obligated to compensate the Commissioner to test the revised product, or confirm the suitability/unsuitability of the substitution or revision.
- C. Specific pre-commissioning responsibilities of Division 26 are as follows
1. Normal start-up services required bringing each system into a fully operational state. This includes motor rotational check, cleaning, lug tightening, control sequences of operation, etc. The Commissioning agent will not begin the commissioning process until each system is complete, including normal contractor start-up and debugging.
 2. Contractor start-up forms may be substituted for the pre-functional test forms with prior approval by the commissioning agent.
 3. Factory or factory approved start-up services will be provided for key equipment and systems specified in Division 22, Division 23 and Division 26. Factory start-up activities to be documented and submitted. The Contractor shall coordinate this work with the manufacturer and the Commissioning agent.
- D. Commissioning is intended to begin upon completion of a system. Commissioning may proceed prior to the completion of systems and/or sub-systems, if expediting this work is in the best interests of the Owner. Commissioning activities and schedule will be coordinated with the Contractor. Start of commissioning before system completion will not relieve the Contractor from completing those systems as per the schedule.
- E. The Field Commissioning Notebook will be used to identify and track all pertinent commissioning documentation required during the Installation phase. This Notebook will be assembled by the Commissioning agent and maintained by the Contractor. The Notebook provides a central location for the Commissioning agent to identify, copy and organize all pertinent information and will include the following format
1. Summary describing Notebook contents and use.
 2. Copy of Commissioning Plan for contractor field reference.
 3. Listing of all specification documentation requirements listed by specification section, with sign off spots for appropriate contractors.
 4. Tabs for each specification section with copies of pre-functional test check sheets provided by coordination of subcontractors and Commissioning agent for contractor completion and space for related contractor-supplied documents.
 5. Prior to functional testing the Commissioning agent will use this book to verify that all appropriate contractors have completed their work and signed off that they have done so. Once the Commissioning agent is satisfied that all components of a systems are complete functional testing will begin.

3.2 PARTICIPATION IN COMMISSIONING

- A. Provide skilled technicians to start up and debug all systems within this Division of work. These same technicians shall be made available to assist the Commissioning agent in completing the commissioning program as it relates to each system and their technical specialty. Work schedules, time required for testing, etc., will be requested by the Commissioning agent and coordinated by the Contractor. Contractor will ensure the qualified technician(s) are available and present during the agreed-upon schedules and of sufficient duration to complete the necessary tests, adjustments, and/or problem resolutions.
- B. System problems and discrepancies may require additional technician time, Commissioning agent time, redesign and/or reconstruction of systems and system components. The additional technician time shall be made available for the subsequent commissioning periods until the required system performance is obtained.
- C. The Commissioning agent reserves the right to judge the appropriateness and qualifications of the technicians relative to each item of equipment, system, and/or sub-system. Qualifications of technicians include expert knowledge relative to the specific equipment involved, adequate documentation and tools to service/commission the equipment, and an attitude/willingness to work with the Commissioning agent to get the job done. A liaison or intermediary between the Commissioning agent and qualified factory representatives does not constitute the availability of a qualified technician for purposes of this work.

3.3 WORK TO RESOLVE DEFICIENCIES

- A. Maladjustments, misapplied equipment, and/or deficient performance under varying loads will result in a system that does not meet the original design intent. Correction of work will be completed under the direction of the Architect, with input from the Contractor, equipment supplier, and Commissioning agent. Whereas all members will have input and the opportunity to discuss, debate, and work out problems, the Architect / Engineer of Record will have final jurisdiction on the necessary work to be done to achieve performance and or design intent.

3.4 ADDITIONAL COMMISSIONING

- A. Additional commissioning activities may be required after system adjustments, replacements, etc., are completed. The Contractor, suppliers, and Commissioning agent shall include a reasonable reserve to complete this work as part of their standard contractual obligations.

3.5 RECOMMISSIONING

- A. After the initial and peak season commissioning is completed, there may be additional work required to serve new or revised loads. This work is not part of the contract.

3.6 TRAINING

- A. The Contractor will be required to participate in the training of the Owner's engineering and maintenance staff for each electrical system and the related components. Training may be conducted in a classroom setting, with system and component documentation, and suitable classroom training aids, or in the field with the specific equipment. The type of training will be per the Owner's option.
- B. Training will be conducted jointly with the Commissioning agent, the design engineers, the equipment vendors, and the Contractor. The Contractor will be responsible for the generic training, as well as instructing the Owner's staff on the system peculiarities specific to this project.

3.7 SYSTEMS DOCUMENTATION

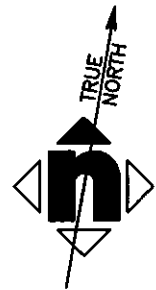
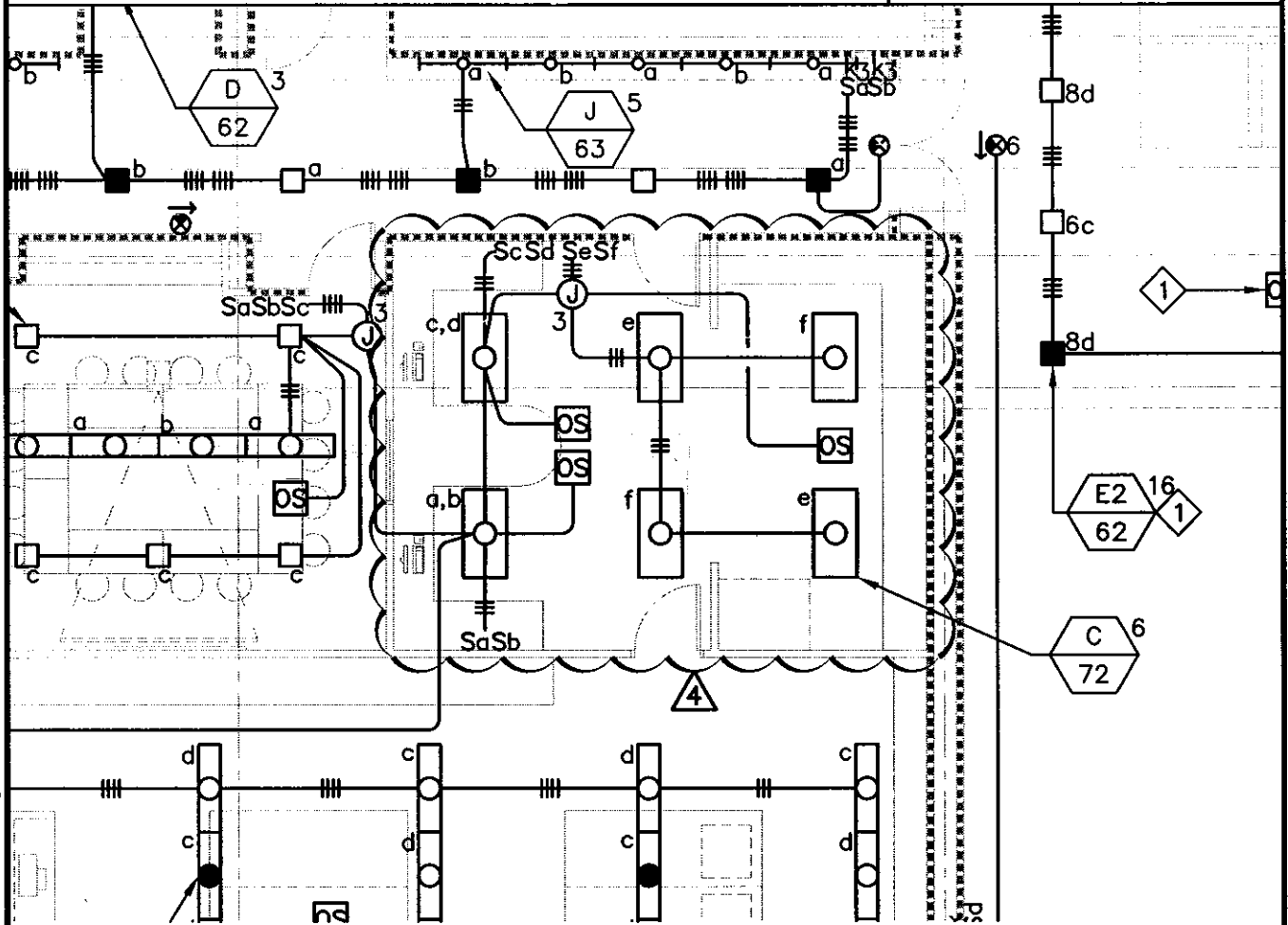
- A. In addition to the requirements of Division 1, update Contract Documents to incorporate field changes and revisions to system designs, to account for actual constructed configurations. All drawings shall be red-lined on two sets. Division 26 as-built drawings shall include updated architectural floor plans, and the individual electrical systems in relation to actual building layout.
- B. Maintain current shop drawings on the job site as required in Division 1. Given the size and complexity of this project, red-lining of the drawings at completion of construction, based on memory of key personnel, is not satisfactory. Continuous and regular red-lining and/or posting of drawings is considered essential and mandatory.
- C. In addition to the stated requirements for operation and maintenance data, provide one copy of equipment technical literature, operation and maintenance literature, and shop drawings to the Commissioning agent as soon as they are available. This requirement is for review of these documents prior to distribution of multiple copies for the Owner's final use.

END OF SECTION

ADDENDUM NO.4

DSA FILE NO. 19-C7

APPLICATION NO. 03-111127



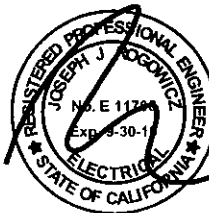
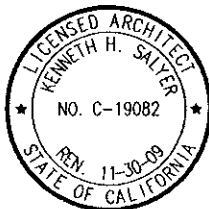
DCGA ENGINEERS

Consulting Mechanical and Electrical Engineers

4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph. 909.987.0017
Fax 909.980.7023



ADDENDUM NO. 04
Date: 08-18-09



HMC
Architects

3546 Concourse Street
Ontario, California 91764
Phone 909-989-9979 • Fax 909-483-1400
www.hmcarchitects.com

Drawing Title: FIRST FLOOR LIGHTING PLAN - SEGMENT 'A'

Reference Drawing: E2.1.1

Scale:
1/8"=1'-0"

Project No.
3311021

Date:
08-18-09



MT. SAN ANTONIO COLLEGE
Design Technology
Center

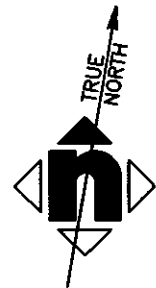
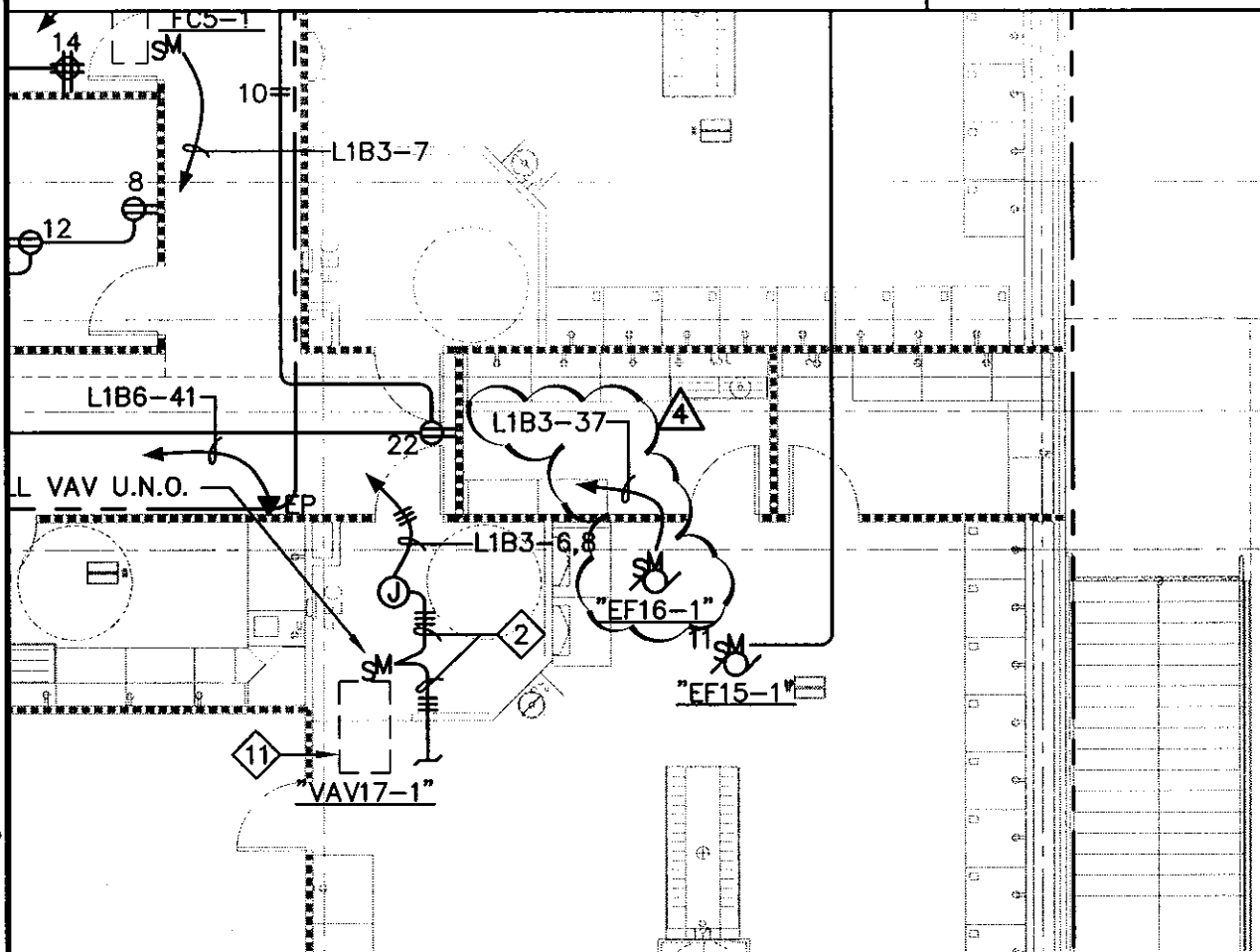
1100 NORTH GRAND STREET
WALNUT, CALIFORNIA 91789

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ADDENDUM NO.4

DSA FILE NO. 19-C7

APPLICATION NO. 03-111127



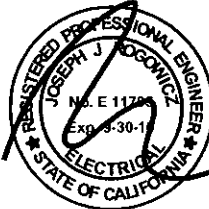
DCGA ENGINEERS

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4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph. 909.987.0017
Fax 909.980.7023



ADDENDUM NO. 04
Date: 08-18-09



Drawing Title: FIRST FLOOR POWER PLAN - SEGMENT 'B'

Reference Drawing: E2.1.5

Scale:
1/8"=1'-0"

Project No.
3311021

Date:
08-18-09

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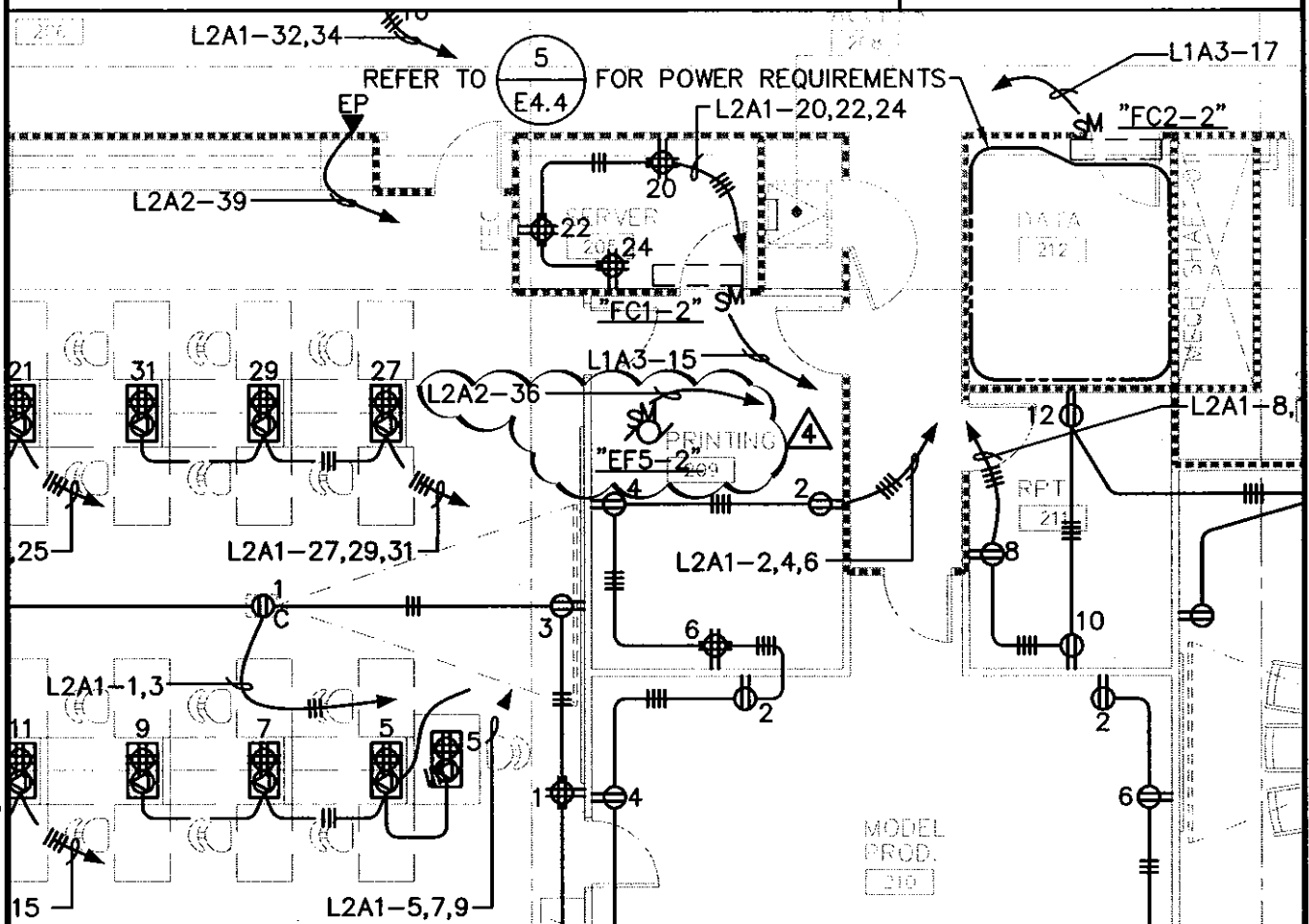
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ADDENDUM NO.4

DSA FILE NO. 19-C7

APPLICATION NO. 03-111127



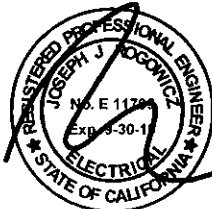
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ADDENDUM NO. 04
Date: 08-18-09



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Drawing Title: SECOND FLOOR POWER PLAN - SEGMENT 'A'

Reference Drawing: E2.2.3

Scale:
1/8"=1'-0"

Project No.
3311021

Date:
08-18-09



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Center

1100 NORTH GRAND STREET
WALNUT, CALIFORNIA 91789

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ADDENDUM NO.4

DSA FILE NO. 19-C7

APPLICATION NO. 03-111127

LOCATION: MECH/ELECT RM 163										PANEL VOLTAGE: 208/120V										CKT CODE: 1-(CONTINUOUS)									
PANEL: PANEL "L183"										PHASE & WIRE: 3PH, 4W										2-(NON-CONTINUOUS)									
AIC RATING: 30000										BUS: 225A										3-(RECEPTACLES)									
										M.O.:										4-(KITCHEN)									
																				NO. OF EQUIP=									
CIRCUIT	NO	CODE	TRIP	POLE	LOAD TYPE & DESIGNATION	MISC	REC	LITE	LOAD	PHASES	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD	LOAD
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3	2								375				1071							1	EP8-1	1	20	2	4				
5	2	20	1		FC4-1	1			698				1698																
7	2	20	1		FC8-1	1			698	1698																			
9	2	20	1		EF14-1	1			698				1026																
11	2	20	1		EF15-1	1			698				1698																
13	2	40	3		EF4-2	1			2904	3904																			
15	2								2904				2985							1	EP12-1	1	20	2	16				
17	2								2904				4026																
19	2	20	1		ROLL-DOWN DOOR	1			500	1624																			
21	3	20	1		ROOF RECP			2	390				1484																
23	2	20	2		HP1-3				1124				2248																
25	2								1124	2248																			
27	2	20	2		HP2-3				1124				2248																
29	2								1124																				
31	3	20	1		ROOF RECP	1			180	660																			
33	2	20	2		ELEVATOR EQUIP	1			600				1876																
35	2								600				1000																
37	2	20	1		EF16-1				664	1560										1	FC3-2	1	20	2	36				
39	2				SPARE					180			180																
41	20	1			SPARE								0																
NOTES:										TOTAL										CONNECTED KVA									
										12763										36.4									
																				CONNUKVA (CODE 1)									
																				0.0									
																				CONNUKVA (CODE 2)									
																				36.7									
																				CONNUKVA (CODE 3)									
																				0.7									
																				CONNUKVA (CODE 4)									
																				0.0									
																				0.0									
																				FEEDER DEMAND KVA									
																				36.4									
																				FEEDER DEMAND AMPS									
																				100.4									
																				KTYMR. KVA									
																				36.4									

4

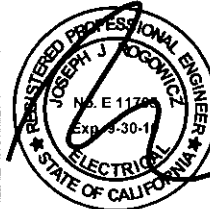
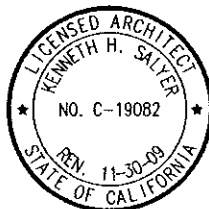
DCGA ENGINEERS

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4750 E. Ontario Mills Pkwy
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4

ADDENDUM NO. 04
Date: 08-18-09



HMC
Architects

3546 Concourse Street
Ontario, California 91764
Phone 909-989-9979 • Fax 909-483-1400
www.hmcarchitects.com

Drawing Title: PANEL SCHEDULES

Reference Drawing: E5.1



MT. SAN ANTONIO COLLEGE
Design Technology
Center

1100 NORTH GRAND STREET
WALNUT, CALIFORNIA 91789

Scale:
NTS

Project No.
3311021

Date:
08-18-09

E4

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ADDENDUM NO.4

DSA FILE NO. 19-C7

APPLICATION NO. 03-111127


LOCATION: STORAGE 214				PANEL VOLTAGE: 200/120V				OCT CODE: 1-(CONTINUOUS)												
PANEL: PANEL "L2A2"				PHASE & WIRE: 3PH, 4W				2-(NON-CONTINUOUS)												
AIC RATING: 10000				BUS: 100A				3-(RECEPTACLES)												
				MANS:				4-(KITCHEN)												
								NO. OF EQUIP=												
CIRCUIT	OCT	BRK	POLE	LOAD TYPE & DESIGNATION				LOAD				LOAD TYPE & DESIGNATION				OCT	BRK	CIRCUIT	NO	
NO	CODE	TRIP		DESCRIPTION	MISC	REC	LITE	VA	A	B	C	VA	LITE	REC	MISC	DESCRIPTION	POLE	TRIP	CODE	NO
1	3	20	1	COMP DRAFTING 201		1		180	360			180		1		DRAFTING LAB 203	1	20	3	2
3	3	20	1	COMP DRAFTING 201		2		360		720		360		2		DRAFTING LAB 203	1	20	3	4
5	3	20	1	COMP DRAFTING 201		2		360			540	180		1		DRAFTING LAB 203	1	20	3	6
7	3	20	1	COMP DRAFTING 201		2		360	720			360		2		DRAFTING LAB 203	1	20	3	8
9	3	20	1	COMP DRAFTING 201		2		360		720		360		2		DRAFTING LAB 203	1	20	3	10
11	3	20	1	COMP DRAFTING 201		2		360			720	360		2		DRAFTING LAB 203	1	20	3	12
13	3	20	1	COMP DRAFTING 201		2		360	720			360		2		DRAFTING LAB 203	1	20	3	14
15	3	20	1	COMP DRAFTING 201		2		360		720		360		2		DRAFTING LAB 203	1	20	3	16
17	3	20	1	COMP DRAFTING 201		2		360			720	360		2		DRAFTING LAB 203	1	20	3	18
19	3	20	1	COMP DRAFTING 201		2		360	720			360		2		DRAFTING LAB 203	1	20	3	20
21	3	20	1	DRAFTING 207		1		180		360		180		1		DRAFTING 213	1	20	3	22
23	3	20	1	DRAFTING 207		2		360			720	360		2		DRAFTING 213	1	20	3	24
25	3	20	1	DRAFTING 207		2		360	720			360		2		DRAFTING 213	1	20	3	26
27	3	20	1	DRAFTING 207		2		360		720		360		2		DRAFTING 213	1	20	3	28
29	3	20	1	DRAFTING 207		2		360			720	360		2		DRAFTING 213	1	20	3	30
31	3	20	1	DRAFTING 207		2		360	720			360		2		DRAFTING 213	1	20	3	32
33	3	20	1	DRAFTING 207		2		360		720		360		2		DRAFTING 213	1	20	3	34
35	3	20	1	DRAFTING 207		2		360			1080	000				EFS-2	1	20	2	36
37	3	20	1	DRAFTING 207		2		360	360							SPARE	1	20		38
39	3	20	1	EMERGENCY PHONE				360		360						SPARE	1	20		40
41	1	20	1	DISPLAY CASE			1	500			500					SPARE	1	20		42
NOTES:				TOTAL				4320	4320	4678	CONNECTED KVA				13.6					
												CONSLKVA (CODE 1)				0.6	0.6			
												CONSLKVA (CODE 2)				0.7	0.7			
												CONSLKVA (CODE 3)				12.4	12.4			
												CONSLKVA (CODE 4)				0.0	0.0			
																0.0				
												FEEDER DEMAND KVA				12.5				
												FEEDER DEMAND AMPS				34.6				
												XTMR. KVA				12.4				

NOTES:

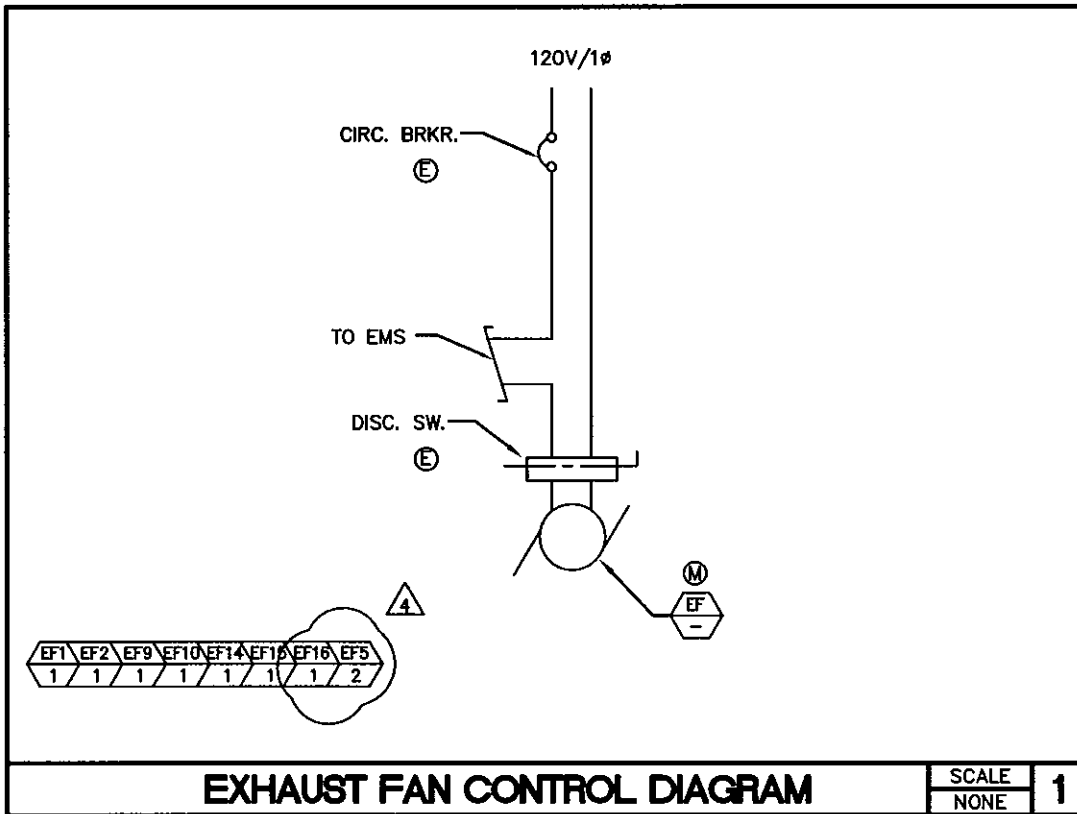
DCGA ENGINEERS
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4 ADDENDUM NO. 04
Date: 08-18-09

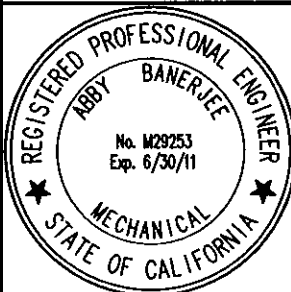
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<p>HMC Architects 3546 Concourse Street Ontario, California 91764 Phone 909-989-9979 • Fax 909-483-1400 www.hmcarchitects.com</p>		<p>Reference Drawing: E5.2</p>  <p>MT. SAN ANTONIO COLLEGE Design Technology Center 1100 NORTH GRAND STREET WALNUT, CALIFORNIA 91789</p>	<p>Scale: NTS</p> <p>Project No. 3311021</p> <p>Date: 08-18-09</p> <p>E5</p>

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ADDENDUM 4

REFERENCE SHEET M5.4



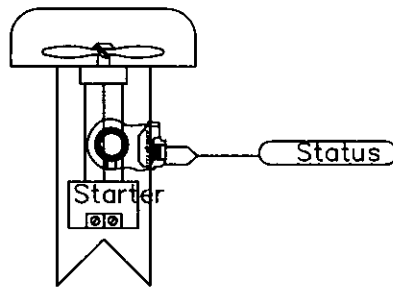
HMC
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Project **DESIGN TECHNOLOGY CENTER**
Mt. San Antonio College

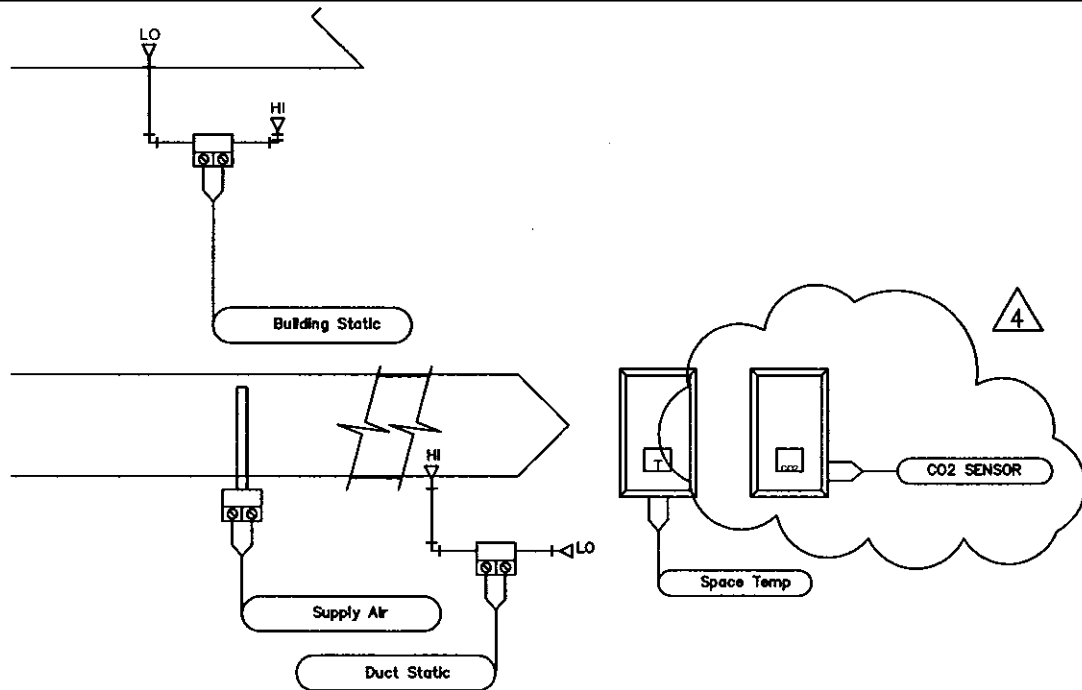
Description
ADDENDUM NO. 4

Scale	N/A
Project No	3311021
Date	08-18-09
Drawing No	M1



EF 1-1, 2-1, 9-1, 10-1, 14-1, 15-1, 16-1, 5-2

EXHAUST FAN CONTROL

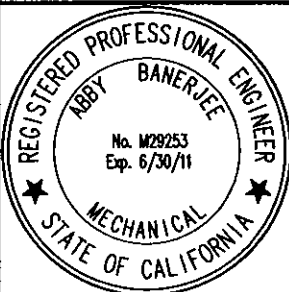


AIR HANDLER AH1-3

VAV AIR HANDLER (SINGLE ZONE) CONTROL DETAIL

ADDENDUM 4

REFERENCE SHEET M6.2



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Description
ADDENDUM NO. 4

Scale	N/A
Project No	3311021
Date	08-18-09
Drawing No	M2

EXHAUST FAN SCHEDULE												
SYM	MFR. & MODEL #	AREA SERVED	CFM	ESP	HP	ELECTRICAL		FAN RPM	TIP SPEED	WT	REMARKS	ANCHORAGE DETAIL
						V	PH					
1E-1	GREENHECK BSO-100-5	SEE PLAN	2180	0.70	1 1/2	115	1	1055		210	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-2	GREENHECK BSO-140NP-3	SEE PLAN	825	0.70	1 1/3	115	1	1152	-	120	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-3	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100		20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-4	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100	-	20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-5	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100	-	20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-6	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100	-	20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-7	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100	-	20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-8	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100	-	20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-9	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100	-	20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3
1E-10	GREENHECK SP-A125	SEE PLAN	100	0.25	53W	115	1	1100	-	20	W/ ALUMINUM GRILLE, FSC, & BOD.	10 102.3

NOTES: SEE DETAIL SHEETS FOR ADDITIONAL ACCESSORIES, PROVIDE CURBS WHERE SHOWN.

AIR HANDLING UNIT SCHEDULE																					
SYM.	MFR. & MODEL NO.	TOTAL CFM	LOW OSA CFM	HIGH OSA CFM	SUPPLY FAN					QTY	COOLING COIL										
					ESP	HP	MOTOR TYPE	FAN RPM	WATER												
									GPM		ENT °F	LVG °F	WPD	ENT °F	LVG °F	WPD	ENT °F	LVG °F	WPD	ENT °F	LVG °F
AH1	HAAKON AIRPAK	12,320	1,600	4,400	2.5	20	VFD	1750	1	70.0	40	56	8.5	83.6/66.2	50.0/49.5	0.8	8	590.0	473.0	18.0	180
AH2	HAAKON AIRPAK	17,520	2,260	9,365	2.5	25	VFD	1750	1	103.0	40	56	5.7	85.6/67.3	50.0/49.5	1.0	8	880.0	680.0	23.0	180
AH1	HAAKON AIRPAK	19,970	2,025	3,880	2.5	25	VFD	1750	1	92.0	40	56	6.5	80.8/65.1	50.0/49.5	0.8	8	750.0	630.0	28.0	180
AH2	HAAKON AIRPAK	21,650	2,260	6,130	2.5	30	VFD	1750	1	108.0	40	56	6.5	80.0/65.1	50.0/49.5	0.8	8	870.0	717.0	28.0	180
AH3	HAAKON AIRPAK	9,000	800	6,500	2.5	15	VFD	1750	1	68.0	40	56	6.8	80.0/64.5	50.0/49.5	1.0	8	542.0	421.0	15.0	180

NOTE:

- AREAS WITH UNIT SUPPLYING MORE THAN 2,000 CFM SHALL BE EQUIPPED WITH A TOTAL COVERAGE SMOKE DETECTION SYSTEM. THE SYSTEM SHALL SHUT DOWN UNIT(S) IN THAT COVERED AREA AND SEND A SIGNAL TO THE BUILDING FIRE ALARM PANEL PER SECTION 809 OF THE CMC. INDIVIDUAL SMOKE DETECTORS IN SUPPLY DUCTS IS NOT REQUIRED. SEE FIRE ALARM DRAWINGS FOR COMPLETE WIRING AND UNIT SHUT-DOWN SEQUENCE.
- AIR BALANCE CONTRACTOR SHALL SET THE OUTSIDE AIR DAMPER VENTILATION AIRFLOW AT (2) POSITIONS PER SCHEDULE. COORDINATE FINAL SETTINGS WITH CONTROLS CONTRACTOR.

ADDENDUM 4

REFERENCE SHEET M0.2

Scale

N/A

Project No

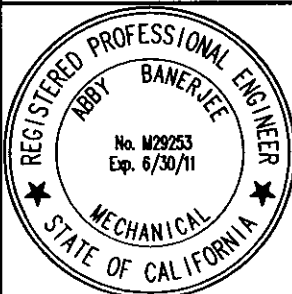
3311021

Date

08-18-09

Drawing No

M3



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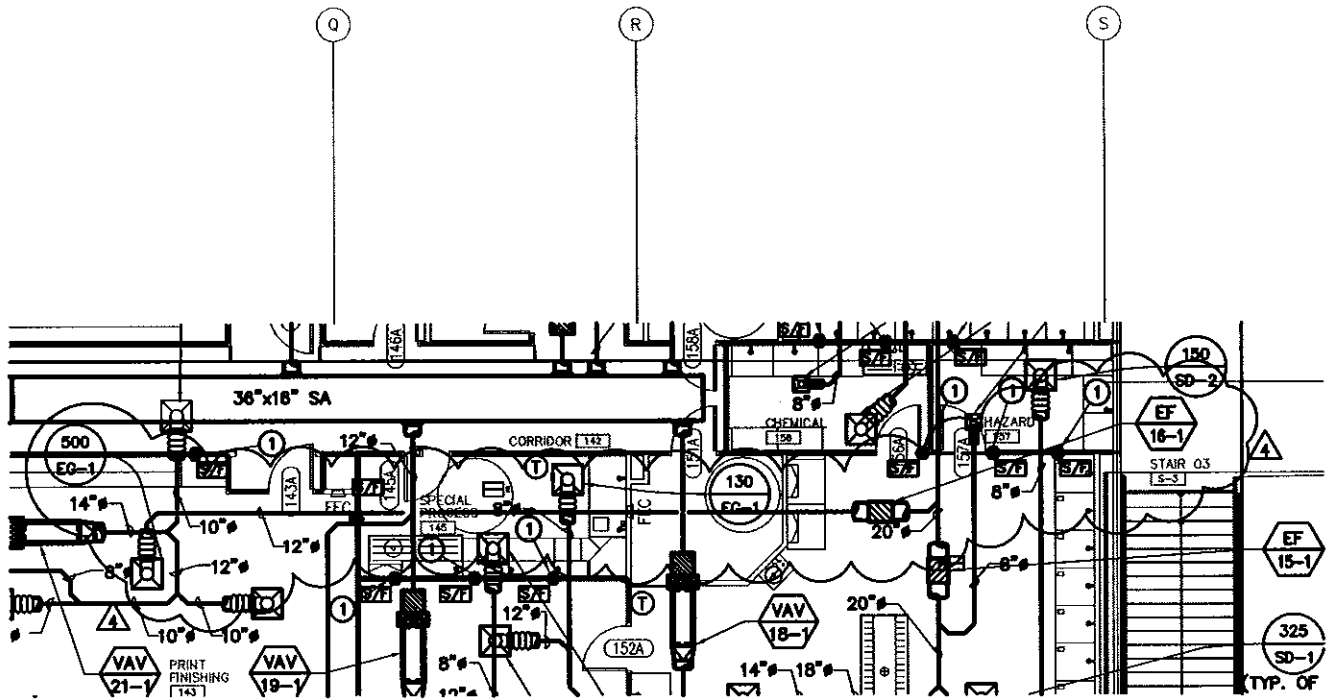
Project

**DESIGN
TECHNOLOGY CENTER**

Mt. San Antonio College

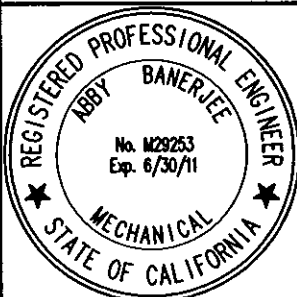
Description

ADDENDUM NO. 4



ADDENDUM 4

REFERENCE SHEET M2.1.2



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Project

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Description

ADDENDUM NO. 4

Scale

1/8" = 1'-0"

Project No

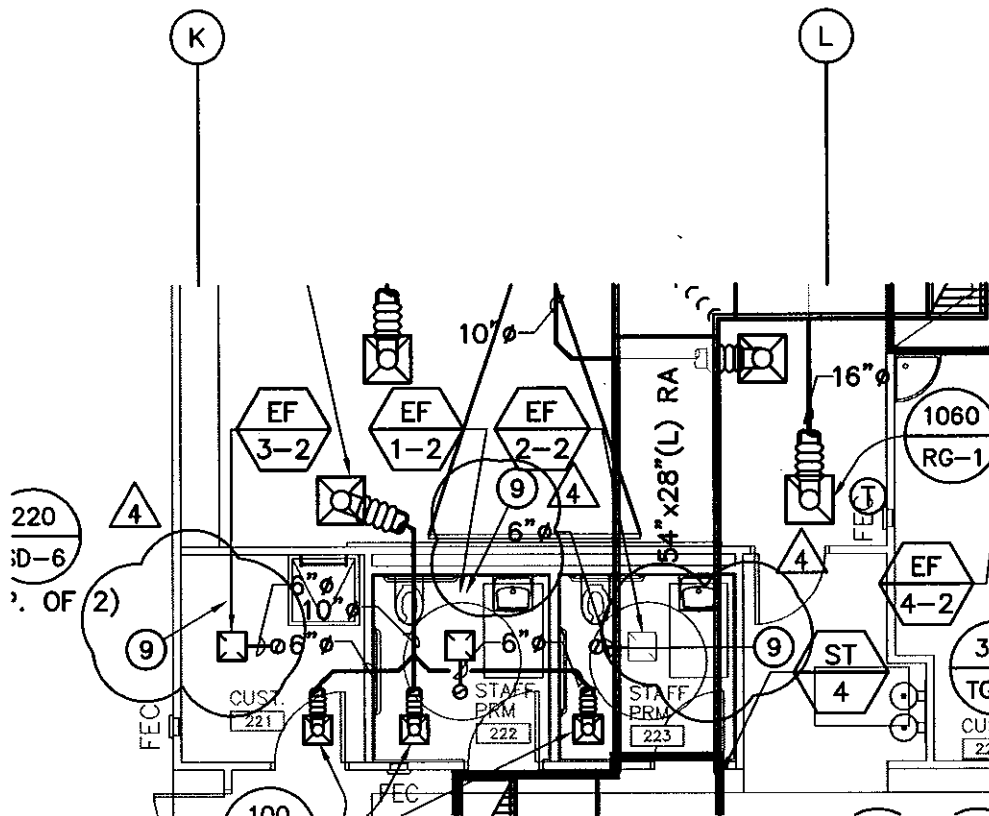
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Date

08-18-09

Drawing No

M5

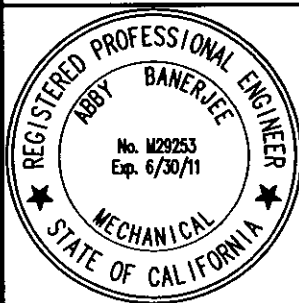


CONSTRUCTION KEY NOTES:

- ④ ⑧ ROUTE 20"Ø EXHAUST DUCT DOWN THRU' ROOF. PROVIDE ROOF CAP WITH CURB AND BIRDSCREEN.
- ⑨ ROUTE 6"Ø EXHAUST DUCT UP THRU' ROOF TO ROOF CAP WITH CURB AND BIRDSCREEN.

④ ADDENDUM 4

REFERENCE SHEET M2.2.2



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Description

ADDENDUM NO. 4

Scale

1/8" = 1' - 0"

Project No

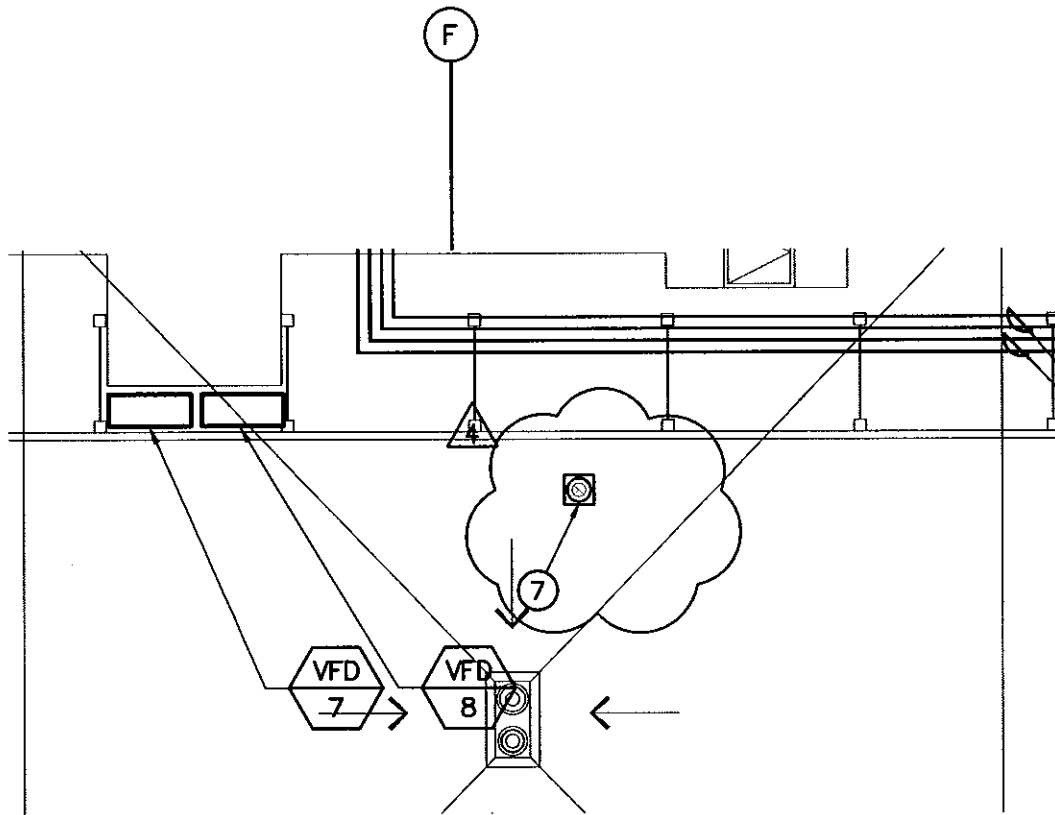
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Date

08-18-09

Drawing No

M6



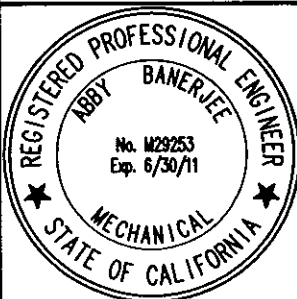
CONSTRUCTION KEY NOTES:

- △ 4 (6) ROUTE 52"x30"(L) RETURN AIR DUCT DOWN THRU ROOF.
- ⑦ 8"Ø EXHAUST AIR DUCT DOWN THRU' ROOF. PROVIDE ROOF CAP AND CURB W/BIRDSCREEN.



ADDENDUM 4

REFERENCE SHEET M3.1.1



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Project

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TECHNOLOGY CENTER**

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Description

ADDENDUM NO. 4

Scale

1/8" = 1' - 0"

Project No

3311021

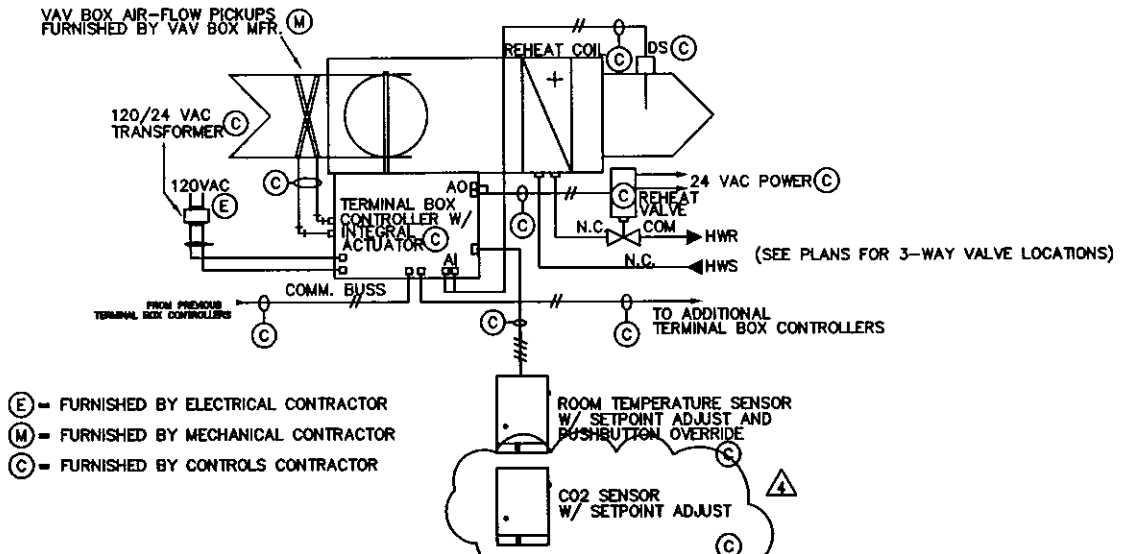
Date

08-18-09

Drawing No

M7

VAV BOX AIR-FLOW PICKUPS
FURNISHED BY VAV BOX MFR.



TYPICAL VAV ZONE CONTROL W/ HOT WATER REHEAT

DEMAND VENTILATION (ALL AIR HANDLERS)

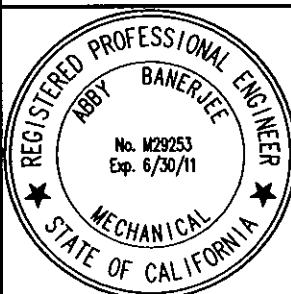
When the average CO2 level in the space exceeds PPM as specified per table below, the economizer damper minimum fresh air setpoint of lower ventilation rate will be increased to higher ventilation rate. (see AH unit mechanical schedule) System shall generate an alarm when PPM rise above higher value listed in table below.

When the average CO2 level drops to lower PPM as per table below, the economizer damper minimum position setpoint will reset to lower ventilation rate. (see AH unit mechanical schedule) Contractor shall verify all final requirements with engineer of record and commissioning agent.

TAG	MAX CO2 LEVELS AT FULL OCC	ALARM LEVEL CO2	TAG	MAX CO2 LEVELS AT FULL OCC	ALARM LEVEL CO2
VAV1-1	1545 PPM	1700 PPM	VAV1-2	1072 PPM	1200 PPM
VAV2-1	1072 PPM	1200 PPM	VAV2-2	1072 PPM	1200 PPM
VAV3-1	993 PPM	1100 PPM	VAV3-2	1072 PPM	1200 PPM
VAV4-1	993 PPM	1100 PPM	VAV4-2	1072 PPM	1200 PPM
VAV5-1	1408 PPM	1600 PPM	VAV5-2	1545 PPM	1700 PPM
VAV6-1	993 PPM	1100 PPM	VAV6-2	1545 PPM	1700 PPM
VAV7-1	1450 PPM	1600 PPM	VAV7-2	1072 PPM	1200 PPM
VAV8-1	1545 PPM	1700 PPM	VAV8-2	993 PPM	1100 PPM
VAV9-1	1072 PPM	1200 PPM	VAV9-2	1072 PPM	1200 PPM
VAV10-1	1092 PPM	1200 PPM	VAV10-2	1072 PPM	1200 PPM
VAV11-1	1545 PPM	1700 PPM	VAV11-2	993 PPM	1100 PPM
VAV12-1	1046 PPM	1200 PPM	VAV12-2	993 PPM	1100 PPM
VAV13-1	993 PPM	1100 PPM	VAV13-2	993 PPM	1100 PPM
VAV14-1	993 PPM	1100 PPM	VAV14-2	993 PPM	1100 PPM
VAV15-1	993 PPM	1100 PPM	VAV15-2	993 PPM	1100 PPM
VAV16-1	993 PPM	1100 PPM	VAV16-2	1840 PPM	2000 PPM
VAV17-1	1092 PPM	1200 PPM	VAV17-2	1072 PPM	1200 PPM
VAV18-1	1092 PPM	1200 PPM	VAV18-2	1072 PPM	1200 PPM
VAV19-1	1545 PPM	1700 PPM	VAV19-2	1072 PPM	1200 PPM
VAV20-1	1092 PPM	1200 PPM	VAV20-2	1072 PPM	1200 PPM
VAV21-1	1092 PPM	1200 PPM	VAV21-2	1072 PPM	1200 PPM
VAV22-1	1046 PPM	1200 PPM	VAV22-2	1072 PPM	1200 PPM
VAV23-1	1072 PPM	1200 PPM	VAV23-2	1975 PPM	2100 PPM
VAV24-1	1072 PPM	1200 PPM	VAV24-2	1545 PPM	1700 PPM
VAV25-1	1545 PPM	1700 PPM	VAV25-2	993 PPM	1100 PPM
VAV26-1	1545 PPM	1700 PPM	VAV26-2	993 PPM	1100 PPM
VAV27-1	993 PPM	1100 PPM	VAV27-2	993 PPM	1100 PPM
VAV28-1	1072 PPM	1200 PPM	VAV28-2	993 PPM	1100 PPM
VAV29-1	1800 PPM	1900 PPM	VAV29-2	1545 PPM	1700 PPM
VAV30-1	1800 PPM	1900 PPM	VAV30-2	1800 PPM	1900 PPM
VAV31-1	1450 PPM	1600 PPM	VAV31-2	1092 PPM	1200 PPM
VAV32-1	1545 PPM	1700 PPM	VAV32-2	1072 PPM	1200 PPM
			VAV33-2	1545 PPM	1700 PPM

4 ADDENDUM 4

REFERENCE SHEET M6.1



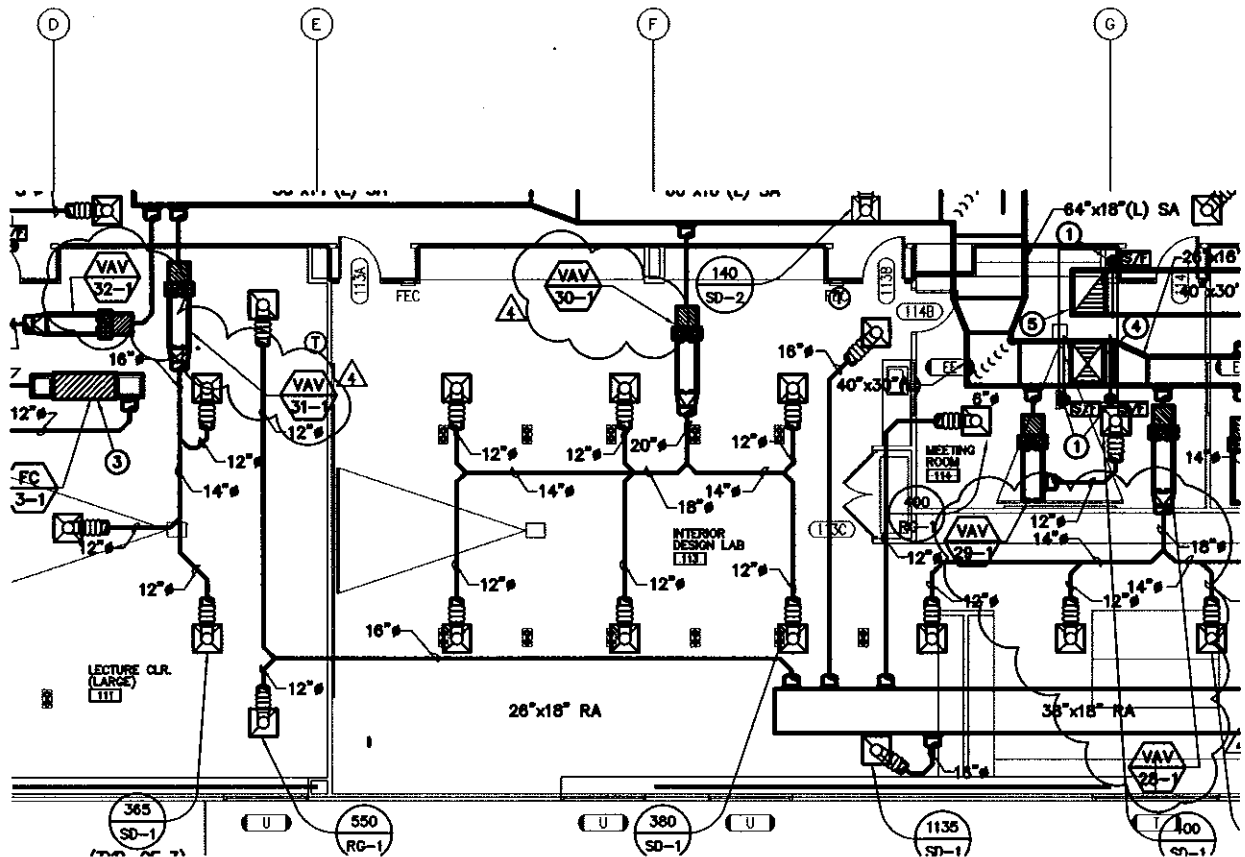
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ARCHITECTS

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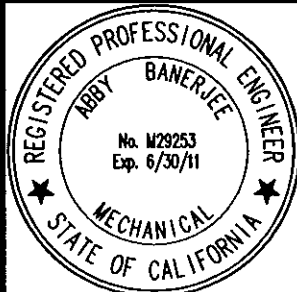
Description **ADDENDUM NO. 4**

Scale	N/A
Project No	3311021
Date	08-18-09
Drawing No	M8



ADDENDUM 4

REFERENCE SHEET M2.1.1



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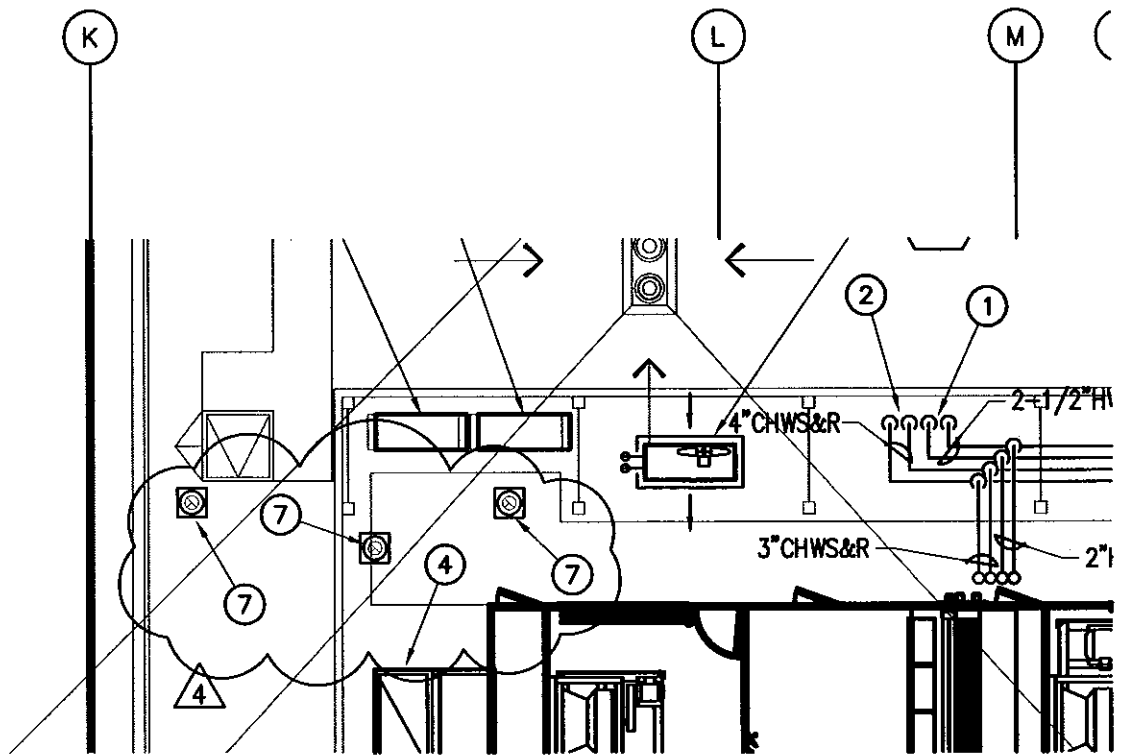
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Description **ADDENDUM NO. 4**

Scale	N/A
Project No	3311021
Date	08-18-09
Drawing No	M9

SYM.	MFR. & MODEL #	AREA SERVED	CFM		MIN. S.P.	INLET SIZE	WATER				HEATING COIL			ROWS	HEATING MSH. CAP.	REMARKS	ANCHORAGE DETAIL
			MIN	MAX			GPM	ENT	PLUG	F	WPD	ENT	AIR LV2				
WAV 30-1	KRUEGER LMHS05	SEE PLANS	90	150	0.10	06	0.4	180	140	0.1	50	110	0.03	1	4.3	PROVIDE LINED PLENUM	(S) DET.
WAV 30-2	KRUEGER LMHS10	SEE PLANS	500	795	0.31	10	1.4	180	140	0.4	50	95	0.23	2	29.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-3	KRUEGER LMHS10	SEE PLANS	295	820	0.20	10	0.8	180	140	0.1	50	90	0.28	1	14.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-4	KRUEGER LMHS14	SEE PLANS	550	1580	0.40	14	1.2	180	140	0.2	50	107	0.32	2	38.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-5	KRUEGER LMHS14	SEE PLANS	480	1800	0.18	14	1.1	180	140	0.1	50	90	0.12	1	21.1	PROVIDE LINED PLENUM	(S) DET.
WAV 30-6	KRUEGER LMHS16	SEE PLANS	830	2750	0.33	16	2.0	180	140	0.5	50	90	0.30	1	33.8	PROVIDE LINED PLENUM	(S) DET.
WAV 30-7	KRUEGER LMHS12	SEE PLANS	360	1050	0.26	12	1.0	180	140	0.3	50	110	0.22	2	24.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-8	KRUEGER LMHS08	SEE PLANS	80	240	0.15	06	0.4	180	140	0.1	50	104	0.05	1	4.6	PROVIDE LINED PLENUM	(S) DET.
WAV 30-9	KRUEGER LMHS14	SEE PLANS	550	1570	0.40	14	1.2	180	140	0.2	50	107	0.32	2	35.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-10	KRUEGER LMHS06	SEE PLANS	120	400	0.17	06	0.4	180	140	0.1	50	97	0.09	1	5.2	PROVIDE LINED PLENUM	(S) DET.
WAV 30-11	KRUEGER LMHS14	SEE PLANS	700	2000	0.44	14	2.4	180	140	0.8	50	90	0.34	2	47.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-12	KRUEGER LMHS12	SEE PLANS	400	1280	0.38	12	1.0	180	140	0.3	50	110	0.31	2	25.7	PROVIDE LINED PLENUM	(S) DET.
WAV 30-13	KRUEGER LMHS05	SEE PLANS	100	320	0.17	06	0.4	180	140	0.1	50	97	0.06	1	5.2	PROVIDE LINED PLENUM	(S) DET.
WAV 30-14	FRANK LMHS10	SEE PLANS	260	800	0.26	10	0.8	180	140	0.1	50	90	0.28	1	14.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-15	FRANK LMHS05	SEE PLANS	190	190	0.12	05	0.6	180	140	0.1	50	104	0.06	2	11.0	PROVIDE LINED PLENUM	(S) DET.
WAV 30-16	FRANK LMHS14	SEE PLANS	1970	4600	0.92	24x16	1.8	180	140	0.2	50	103	0.41	2	70.0	PROVIDE LINED PLENUM	(S) DET.



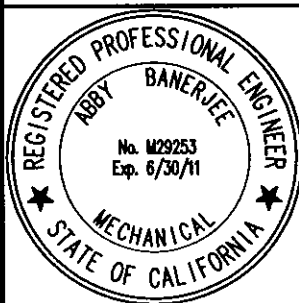
CONSTRUCTION KEY NOTES:

- ④ (6) ROUTE 60"x24"(L) RETURN AIR DUCT DOWN THRU ROOF.
- ⑦ (7) 6"Ø EXHAUST AIR DUCT DOWN THRU' ROOF. PROVIDE ROOF CAP AND CURB W/BIRDSCREEN.



ADDENDUM 4

REFERENCE SHEET M3.1.2



HMC
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Project **DESIGN
TECHNOLOGY CENTER**

Mt. San Antonio College

Description
ADDENDUM NO. 4

Scale
1/8" = 1' - 0"

Project No
3311021

Date
08-18-09

Drawing No
M11