TECHNICAL SPECIFICATIONS

HOTEL SANDFORD

REHABILITATION



Hotel Sandford ca. 1914, Photograph courtesy of the San Diego History Center

Prepared for:

San Diego Housing Commission

1122 Broadway, Suite 300 San Diego, CA 92101

Prepared by:

Heritage Architecture & Planning

625 Broadway, Suite 800 San Diego, CA 92101 HOTEL SANDFORD February, 2011

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Project information.
- 2. Phased construction.
- 3. Purchase contracts.
- 4. Contractor-furnished, Owner-installed products.
- 5. Access to site.
- 6. Coordination with occupants.
- 7. Work restrictions.

B. Related Requirements:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: Hotel Sandford Rehabilitation
 - 1. Project Location: 1301-1333 Fifth Avenue, San Diego, CA 92101.
- B. Owner: San Diego Housing Commission.
- C. Architect: Heritage Architecture & Planning
- D. Construction Manager: Chris Tatum, Tatum Consulting & Management.
 - 1. Construction Manager has been engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and Contractor, according to a separate contract between Owner and Construction Manager.

1.4 PHASED CONSTRUCTION

- A. The Work shall be conducted in phases, with each phase substantially complete as indicated:
 - 1. The building will remain occupied during construction and the total construction period shall not exceed eight months. Construction on the residential floors shall be phased to allow continued use by existing tenants. The Contractor may include up to 15 residential units per phase. Each phase

shall be completed within 10 calendar days (including punch-list). Common areas and corridors on each floor shall be completed with the last group of residential units on that floor. Construction shall begin in the northeast corner of the third floor and proceed in a manner selected by the Contractor and approved by the owner prior to the start of construction. Contractor is required to submit a preliminary Construction Phasing Schedule to address interior and exterior improvements with the bid. The Construction schedule shall include a detailed phasing strategy indicating which rooms are included in each phase and the construction duration per phase. A final construction schedule is due within 10 days of Notice to Proceed.

B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

1.5 CONTRACTOR-FURNISHED. OWNER-INSTALLED PRODUCTS

- A. Contractor shall furnish products indicated. The Work includes unloading, handling, storing, and protecting Contractor-furnished products as directed and turning them over to Owner at Project closeout.
- B. Contractor-Furnished, Owner-Installed Products:
 - 1. Compact fluorescent light bulbs as indicated in the electrical drawings.

1.6 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas per phase indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated during that phase of construction.
 - 1. Limits: Confine construction operations to areas designated for that phase of construction. Areas of the unimproved basement may be used for materials storage and staging as approved by building management.
 - 2. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, residents, retail tenants, retail costumers, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations. The preferred entrance for construction operations is on A Street.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage.

Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

- 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction. All retail shall remain open during construction. The Contractor is responsible to provide proper scaffolding, covered walkways, platforms, and all necessary protection to allow the public and employees to use and operate businesses in accordance with all authorities having jurisdiction.
- 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 - 2. Obtain a and required inspections and approvals from authorities having jurisdiction before limited Owner occupancy if needed.
 - 3. Before substantial completion, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 - 4. At occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.8 COORDINATION WITH OWNER CONSULTANTS

- A. Owner Consultants: In addition to the design and construction management team, the Owner has retained the services of the following professional consultants for this project. It shall be the responsibility of the Contractor to coordinate with these consultants throughout the construction process.
 - 1. Prevailing Wage Consultant: A Prevailing Wage Consultants has been retained by SDHC under separate contract to ensure that the Contractor complies with state prevailing wage requirements. The Contractor shall maintain proper accounting records and invoice files to document payment of prevailing wage rates. The Prevailing Wage Consultant will audit said records.
 - 2. Temporary Relocation Consultant: A Temporary Relocation Consultant has been retained by SDHC under separate contract to coordinate temporary relocation of the building's residential tenants during rehabilitation of their units. During the phased interior rehabilitation, residents will be temporarily relocated to vacant units elsewhere in the building. After work in their units is complete, the residents will be moved back to their units. The Contractor shall be responsible to coordinate with the Temporary Relocation Consultant during the interior rehabilitation work to schedule the phased relocations and ensure a smooth transition for tenants.
 - 3. Special Inspectors: Special Inspectors have been retained by SDHC under separate contract for structural and roofing inspections as listed in the drawings and specifications.

1.9 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction. Maintain safe and proper access to retail tenant entrances and main hotel entrances.

- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Saturday, unless otherwise indicated.
 - 1. Weekend Hours: No Sunday hours. See above for acceptable hours on Saturday.
 - 2. Hours for Utility Shutdowns: Coordinate with Owner not less than 72 hours in advance.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Building Manager not less than 72 hours in advance of proposed utility interruptions.
 - 2. Obtain Building Manager's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Tenant occupancy with Owner. Use of audible radios and music players is prohibited.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.
- F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. The Construction Drawings also include a list of the alternates on Sheet TS2 which is indexed by number throughout the drawing set. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Basement Stair Cap.
 - 1. Base Bid: Leave both existing stairs as-is. Base bid will include painting the exterior side of the stair well.
 - 2. Alternate: Cap one of the basement stair openings. The existing concrete stair shall be left in place. The stair is located adjacent to the Fifth Avenue entrance to the Hotel next to grid line F between gridlines 7-9 as indicated on sheet A1-2 of the drawings and referenced details
- B. Alternate No. 2: Residential Storage Locker Room.
 - 1. Base Bid: The existing unimproved basement area would remain as-is with no improvements to existing finishes or fixtures. The existing ramps and walls would remain in place.
 - 2. Alternate: Construction of a residential storage locker room in the unimproved basement. Work shall include demolition of existing wood framed walls and ramps, construction of new wood framed walls and ramps, installation of prefabricated metal locker units, lighting, and finishes as indicated on sheet A5-1 and consultant drawings.
- C. Alternate No. 3: Staff Kitchen.
 - 1. Base Bid: The proposed new resident kitchen would be added as shown on the drawings and all commercial cooking equipment would be removed. The existing space designated for the staff kitchen would remain unimproved.
 - 2. Alternate: Installation of a staff kitchen in the basement. Work shall include new wall construction, electrical, mechanical, and plumbing improvements, built-in cabinetry, appliances, fixtures, and finishes as indicated in the staff kitchen on sheet A5-1 and consultant drawings.
- D. Alternate No. 4: Basement Vending Area Improvements.
 - 1. Base Bid: The existing vending area and all related finishes, fixtures, and equipment would remain as-is.
 - 2. Alternate: Basement vending area and adjacent storage closet. Work shall include related demolition, wall construction, electrical, mechanical, and finishes as indicated on sheet A1-1 and consultant drawings.
- E. Alternate No. 5: Basement Activity Room Improvements.
 - 1. Base Bid: The existing room (currently the TV Lounge) and all related finishes, fixtures, and equipment would remain as-is. The base bid shall include replacement of existing flooring per the drawings.
 - 2. Alternate: Basement activity room and adjacent storage closet. Work shall include related demolition, wall construction, electrical, mechanical, and finishes as indicated on sheet A1-1 and consultant drawings.
- F. Alternate No. 6: Hotel Entry Storefront Replacement.
 - 1. Base Bid: The existing aluminum framed storefront would remain as-is. Required hardware upgrades would be completed per the specifications.
 - 2. Alternate: Removal of the existing aluminum framed storefront entry to the main Hotel Lobby and installation of a new period-style wood framed storefront entrance and windows. This alternate also includes removal of the existing interior wood-framed planter boxes and decorative plaster columns as well as related floor and finish patching and repair as indicated on sheet A1-2, A8-3, and consultant drawings.

G. Alternate No. 7: Resident Computer Room.

- 1. Base Bid: The existing private office and all related finishes, fixtures, and equipment would remain as-is. The base bid shall include replacement of existing flooring per the drawings.
- 2. Alternate: Computer room improvements including built-in cabinets and counters, data and electrical connections, and the glass light door and sidelight as indicated on sheet A1-2 and consultant drawings.

H. Alternate No. 8: Floor Drains.

- 1. Base Bid: No new floor drains would be installed in resident bathrooms. All other plumbing improvements indicated in the drawings and specifications would be completed.
- 2. Alternate: Installation of floor drains in the second floor residential bathrooms above retail spaces (28 total) and the associated waste and vent piping, as indicated on the plumbing drawings.

I. Alternate No. 9: Keyless Entry Hardware at 130 Residential Units.

- 1. Base Bid: Existing doors and hardware for 130 residential units would remain in place. The base bid shall include painting and required repairs for all doors as indicated in the drawings.
- 2. Alternate: Installation of keyless entry hardware at all residential units (130 units) per the specifications.

J. Alternate No. 10: Non-Code Mechanical Improvements.

- 1. Base Bid: The base bid shall include all other mechanical improvements listed in the drawings and specifications
- 2. Alternate: Non-code mechanical improvements including installation of a modulating 3-way control valve in the hot water return line at each fan coil unit in the residential corridors and units, replacement of existing return grilles with new 16x6 filter grilles and filters at the residential corridors and units, cleaning of all diffusers and ductwork, and the cleaning and servicing of all existing fan coil units in the residential corridors and units as indicated on the mechanical drawings.

K. Alternate No. 11: Library and Coffee Bar Custom Casework.

- 1. Base Bid: The existing reception desk and signage shall be left in place. New free-standing bookcases shall be purchased and installed per the interior design drawings.
- 2. Alternate: Installation of custom-fabricated built-in casework in the Library and Coffee Bar per the interior design drawings.

L. Alternate No. 12: Insect Screens

- 1. Base Bid: The base bid shall include all window repairs and improvements listed in the drawings and specifications.
- 2. Alternate: Installation of new aluminum framed windows screens on all operable windows including windows facing the light well. The screen frames shall have powder-coated or bakedenamel finish (color to match window frames). Refer to specifications Section 08152.93.

M. Alternate No. 13: Barber College Flooring

- 1. Base Bid: The base bid shall include no improvements to existing finishes in the tenant retail spaces.
- 2. Alternate: Installation of new resilient flooring with integral cove base in Barber College tenant space as indicated on sheet A1-2 and A7-1 of the drawings.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Division 01 Section "Alternates" for products selected under an alternate.
 - 2. Divisions 02 through 33 Sections for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- e. Samples, where applicable or requested.
- f. Certificates and qualification data, where applicable or requested.
- g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
- h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
- i. Research reports evidencing compliance with building code in effect for Project.
- j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.
 - i. Requested substitution provides specified warranty.
 - j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:

1. Division 01 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 8 calendar days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. Provide subcontractor and materials suppliers backup quotes that support all costs broken down in the same fashion requested under this section. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- e. Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect and Construction Manager.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. Provide subcontractor and materials suppliers backup quotes that support all costs broken down in the same fashion requested under this section. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - 6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 - 7. Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Contractor will prepare a Change Order for signatures of Owner, Architect and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

- 1. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
- 2. Division 01 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 - 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule.
 - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders issued before last day of construction period covered by application.
 - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
 - 5. The Contractor shall organize a meeting on or about the 25th day of each month to review draft and approved Payment Application items and agree on the amount and percentage of work that is complete prior to the final draft Payment Application being forwarded to the Architect.

Attendants at the meeting shall include the Contractor, Architect, Owner, and Construction Manager.

- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 - 3. Provide summary documentation for stored materials indicating the following:
 - Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - 1. Submit partial unconditional waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit conditional final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. Contractor's construction schedule (preliminary if not final).
 - 2. Submittal schedule (preliminary if not final).
 - 3. Certificates of insurance and insurance policies.
 - 4. Performance and payment bonds.
 - 5. Prior to intial Application for Payment, the Contractor shall submit to the Architect a schedule of Values for the project for approval.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete minus the value of any incomplete items or work that is listed on the punchlist.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

- 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 - 1. Evidence of completion of Project closeout requirements.
 - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - 3. Updated final statement, accounting for final changes to the Contract Sum.
 - 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 - 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 - 6. AIA Document G707, "Consent of Surety to Final Payment."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

- 1. Division 01 Section "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
- 2. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
- 3. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
- 4. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.
- 5. Division 01 Section "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

A. RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, [on Project Web site,]and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preparation and distribution of meeting minutes from Owner/Contractor construction meetings.
 - 7. Preinstallation conferences.
 - 8. Project closeout activities.
 - 9. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.
- 1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect and Construction Manager.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716.
- D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow up to 10 working days for Architect's response for each RFI. RFIs received by Architect and Construction Manager after 3:00 p.m. will be considered as received the following working day.
 - 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."

- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within five calendar days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. And include the following information.
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect and Construction Manager.
 - 4. RFI number including RFIs that were returned without action or withdrawn.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's and Construction Manager's response was received.
 - 8. Status of each RFI submitted.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within five calendar days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

- A. General: Contractor will schedule and conduct weekly meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner, Construction Manager and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Contractor will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, and Architect, within five days of the meeting.
- B. Preconstruction Conference: Architect and Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 - 1. Conduct the conference to review responsibilities and personnel assignments.
 - 2. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Final construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.

- f. Procedures for processing field decisions and Change Orders.
- g. Procedures for RFIs.
- h. Procedures for testing and inspecting.
- i. Procedures for processing Applications for Payment.
- j. Distribution of the Contract Documents.
- k. Submittal procedures.
- 1. Preparation of record documents.
- m. Use of the premises and existing building.
- n. Work restrictions.
- o. Working hours.
- p. Owner's occupancy requirements.
- q. Responsibility for temporary facilities and controls.
- r. Procedures for moisture and mold control.
- s. Procedures for disruptions and shutdowns.
- t. Construction waste management and recycling.
- u. Parking availability.
- v. Office, work, and storage areas.
- w. Equipment deliveries and priorities.
- x. First aid.
- y. Security.
- z. Progress cleaning.
- 4. Minutes: Contractor will record and distribute meeting minutes.
- C. Project Closeout Conference: Architect and Construction Manager will schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
 - 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for completing [sustainable design] documentation.
 - e. Requirements for preparing operations and maintenance data.
 - f. Requirements for delivery of material samples, attic stock, and spare parts.
 - g. Requirements for demonstration and training.
 - h. Preparation of Contractor's punch list.
 - i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - j. Submittal procedures.
 - k. Owner's partial occupancy requirements.
 - 1. Responsibility for removing temporary facilities and controls.
 - 4. Minutes: Contractor will record and distribute meeting minutes.
- D. Progress Meetings: Construction Manager will conduct progress meetings at weekly intervals.
 - 1. Coordinate dates of meetings with preparation of payment requests.

- 2. Attendees: Representatives of Owner, Construction Manager, Architect, and General Contractor shall be present at these meetings. Additionally, attendance by subcontractors, suppliers, and other entities concerned with current progress or involved in planning, coordination, or performance of future activities may be required as needed. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
- 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
- 4. Minutes: Contractor will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

February, 2011
PROJECT MANAGEMENT AND COORDINATION

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Construction schedule updating reports.
- B. Related Requirements:
 - 1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
 - 2. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Three paper copies.
- B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- D. Construction Schedule Updating Reports: Submit with Applications for Payment.

1.4 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.

- 3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
- 4. Review delivery dates for Owner-furnished products.
- 5. Review schedule for work of Owner's separate contracts.
- 6. Review submittal requirements and procedures.
- 7. Review time required for review of submittals and resubmittals.
- 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
- 9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
- 10. Review and finalize list of construction activities to be included in schedule.
- 11. Review procedures for updating schedule.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.
 - 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Phasing: Arrange list of activities on schedule by phase.
 - 2. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Submittals.
 - b. Mockups.
 - c. Installation.
 - d. Startup and placement into final use and operation.
 - 3. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Substantial Completion.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
 - 1. See Division 01 Section "Payment Procedures" for cost reporting and payment procedures.
- F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and Contract Time.
- G. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- H. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
 - 1. Use Microsoft Project, for Windows XP operating system.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT/PERT COMBO CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 10 days of date established for the Notice to Proceed. The schedule shall fully link tasks to indicate connections between related tasks and predecessors. Base schedule on the startup construction schedule and additional information received since the start of Project.

- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.
 - 2. Show sequencing and connection between related task.

2.3 CONTRACTOR'S "LOOK AHEAD" SCHEDULE

A. Look Ahead Schedule: Contractor to provide a 2-week Look Ahead schedule at each construction meeting to summarize work scheduled in the upcoming two week period.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
 - 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:

- 1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
- 2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
- 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

- 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - Submit revised submittal schedule to reflect changes in current status and timing for submittals.
- 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: If requested by the Contractor, electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
 - 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD
 - c. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual at the end of this section.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

- 1. Initial Review: Allow up to 15 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
- 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
- 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- 4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Location(s) where product is to be installed, as appropriate.
 - j. Other necessary identification.
 - 4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - 5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use AIA Document G810.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Action Submittals: Submit four paper copies of each submittal unless otherwise indicated. Architect will return three copies.
 - 2. Informational Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 - 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - 4. Submit Product Data before or concurrent with Samples.
 - 5. Submit Product Data in the following format:
 - Four paper copies of Product Data unless otherwise indicated. Architect will return three
 copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Compliance with specified standards.
 - c. Notation of coordination requirements.
 - d. Notation of dimensions established by field measurement.
 - e. Relationship and attachment to adjoining construction clearly indicated.

- 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
- 3. Submit Shop Drawings in the following format:
 - Four opaque copies of each submittal. Architect will retain two copies; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 - 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 - 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 - 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, will return submittal with options selected.
 - 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

- 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- F. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- G. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'SACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general protection and treatment procedures for entire Project and the following specific work:
 - 1. Historic removal and dismantling.

B. Related Requirements:

1. Division 08 Section "Historic Treatment of Wood Windows" for specific requirements for cleaning and repairing wood windows.

1.3 DEFINITIONS

- A. Existing to Remain: Existing items that are not to be removed or dismantled.
- B. Historic: Spaces, areas, rooms, surfaces, materials, finishes, and overall appearance which are important to the successful rehabilitation as determined by Architect.
- C. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- D. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- E. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.
- F. Remove: Specifically for historic spaces, areas, rooms, and surfaces, the term means to detach an item from existing construction to the limits indicated, using hand tools and hand-operated power equipment, and legally dispose of it off-site, unless indicated to be salvaged or reinstalled.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. Includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

- J. Retain: To keep existing items that are not to be removed or dismantled.
- K. Reversible: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials unless otherwise indicated.
- L. Salvage: To protect removed or dismantled items and deliver them to Owner ready for reuse.
- M. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

1.4 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to antiques, and other items of interest or value to Owner that may be encountered during removal and dismantling work remain Owner's property. Carefully dismantle and salvage each item or object.
- B. Coordinate with Architect, who will establish special procedures for dismantling and salvage.

1.5 INFORMATIONAL SUBMITTALS

- A. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's historic treatment operations.
- B. Inventory of Salvaged Items: After removal or dismantling work is complete, submit a list of items that have been salvaged.

1.6 QUALITY ASSURANCE

- A. Historic Treatment Specialist Qualifications: An experienced firm regularly engaged in historic treatments similar in nature, materials, design, and extent to this work as specified in each section, and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrate the firm's qualifications to perform this work.
 - 1. Field Supervisor Qualifications: Full-time supervisors experienced in historic treatment work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on Project site during times that historic treatment work is in progress.
 - 2. Worker Qualification: Persons who are experienced in historic treatment work of types they will be performing.
- B. Mockups: Prepare mockups of specific historic treatment procedures specified in the drawings or this Section to demonstrate aesthetic effects and to set quality standards for materials and execution.
- C. Regulatory Requirements: Comply with notification regulations of authorities having jurisdiction before beginning removal and dismantling work. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI/ASSE A10.6.
- E. Historic Treatment Preconstruction Conference: Conduct conference at Project site.

- 1. General: Review methods and procedures related to historic treatment including, but not limited to, the following:
 - a. Review manufacturer's written instructions for precautions and effects of historic treatment procedures on materials, components, and vegetation.
 - b. Review and finalize historic treatment construction schedule; verify availability of materials, equipment, and facilities needed to make progress and avoid delays.
 - c. Review qualifications of personnel assigned to the work and assign duties.
 - d. Review material application, work sequencing, tolerances, and required clearances.
 - e. Review areas where existing construction is to remain and requires protection.

2. Removal and Dismantling:

- a. Inspect and discuss condition of construction to be removed or dismantled.
- b. Review requirements of other work that relies on substrates exposed by removal and dismantling work.

1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS

- A. Historic Materials for Reinstallation:
 - 1. Repair and clean historic items as indicated and to functional condition for reuse.
 - Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make item functional for use indicated.
- B. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

1.8 PROJECT CONDITIONS

- A. General Size Limitation in Historic Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches (300 mm) or more.
- B. Owner will occupy portions of building immediately adjacent to removal and dismantling area. Conduct removal and dismantling work so Owner's operations will not be disrupted.
- C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- E. Hazardous Materials: Hazardous materials are present in construction affected by removal and dismantling work. A report on the presence of hazardous materials is included in the Appendix of these specifications. Examine report to become aware of locations where hazardous materials are present.

- 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
- 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- 3. If unanticipated asbestos is suspected, stop work in the area of potential hazard, shut off fans and other airhandlers ventilating the area, and rope off area until the questionable material is identified. Re-assign workers to continue work in unaffected areas. Resume work in the area of concern after safe working conditions are verified.
- F. Storage or sale of removed or dismantled items on-site is not permitted unless otherwise indicated.

1.9 COORDINATION

A. Coordinate historic treatment procedures in this Section with public circulation patterns at Project site. Some work is near public circulation patterns. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

- A. Removal Equipment: Use only hand-held tools except as follows or unless otherwise approved by Architect on a case-by-case basis:
 - 1. Large air hammers are not permitted.
- B. Dismantling Equipment: Use manual, hand-held tools, except as follows or otherwise approved by Architect on a case-by-case basis:
 - 1. Hand-held power tools and cutting torches are permitted only as submitted in the historic treatment program. They must be adjustable so as to penetrate or cut only the thickness of material being removed.
 - 2. Pry bars more than 18 inches (450 mm) long and hammers weighing more than 2 lb (0.9 kg) are not permitted for dismantling work.

3.2 EXAMINATION

- A. Preparation for Removal and Dismantling: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.
 - 1. Verify that affected utilities have been disconnected and capped.
 - 2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage.

- 3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
- 4. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures as a result of removal and dismantling work.
- B. Perform surveys as the Work progresses to detect hazards resulting from historic treatment procedures.

3.3 PROTECTION, GENERAL

- A. Comply with temporary barrier requirements in Division 01 Section "Temporary Facilities and Controls."
- B. Ensure that supervisory personnel are on-site and on duty when historic treatment work begins and during its progress.
- C. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Provide barricades, barriers, and temporary directional signage to exclude public from areas where historic treatment work is being performed.
 - 3. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of historic treatment work.
 - 4. Contain dust and debris generated by removal and dismantling work and prevent it from reaching the public or adjacent surfaces.
 - 5. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
 - 6. Protect floors and other surfaces along haul routes from damage, wear, and staining.
 - 7. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.

D. Temporary Protection of Historic Materials:

- 1. Protect existing historic materials with temporary protections and construction. Do not deface or remove existing materials.
- 2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Architect.
- E. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

F. Utility and Communications Services:

- 1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by the historic treatment work before commencing operations.
- 2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for the historic treatment work.
- 3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

- G. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.
 - 1. Prevent solids such as stone or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from historic treatment work.
 - 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- H. Existing Roofing: Prior to the start of work in an area, install roofing protection.

3.4 GENERAL HISTORIC TREATMENT

- A. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.
- B. Halt the process of deterioration and stabilize conditions unless otherwise indicated. Perform work as indicated on Drawings. Follow the procedures in subparagraphs below and procedures approved in historic treatment program:
 - 1. Retain as much existing material as possible; repair and consolidate rather than replace.
 - Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
 - 3. Use reversible processes wherever possible.
 - Use historically accurate repair and replacement materials and techniques unless otherwise indicated.
 - 5. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction documentation photographs.
- C. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by Architect.
- D. Where missing features are indicated to be repaired or replaced, provide features whose designs are based on accurate duplications rather than on conjectural designs, subject to approval of Architect.
- E. Where Work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.
- F. Identify new and replacement materials and features with permanent marks hidden in the completed work to distinguish them from original materials. Record a legend of identification marks and the locations of the items on record Drawings.

3.5 HISTORIC REMOVAL AND DISMANTLING

- A. General: Have removal and dismantling work performed by a qualified historic removal and dismantling specialist. Ensure that historic removal and dismantling specialist's field supervisors are present when removal and dismantling work begins and during its progress.
- B. Perform work according to the historic treatment program and approved mockup(s) as applicable.

- 1. Provide supports or reinforcement for existing construction that becomes temporarily weakened by the work, until the work is completed.
- 2. Perform cutting by hand or with small power tools wherever possible. Cut holes and slots neatly to size required, with minimum disturbance of adjacent work.
- 3. Do not operate air compressors inside building, unless approved by Architect in each case.
- 4. Do not drill or cut columns, beams, joints, girders, structural slabs, or other structural supporting elements, without having Contractor's professional engineer's written approval for each location before such work is begun.
- 5. Do not use explosives.
- C. Water-Mist Sprinkling: Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.
- D. Unacceptable Equipment: Keep equipment that is not permitted for historic removal or dismantling work away from the vicinity where such work is being performed.
- E. Removing and Dismantling Items on or near Historic Surfaces:
 - 1. Use only dismantling tools and procedures within 12 inches (300 mm) of historic surface. Do not use pry bars. Protect historic surface from contact with or damage by tools.
 - 2. Unfasten items to be removed, in the opposite order from which they were installed.
 - 3. Support each item as it becomes loosened to prevent stress and damage to the historic surface.
 - 4. Dismantle anchorages.

3.6 HISTORIC REMOVAL AND DISMANTLING SCHEDULE

- A. Existing Items to Be Removed: Refer to the Construction Drawings.
- B. Existing Items to Be Removed and Salvaged: Refer to the Construction Drawings.
- C. Existing Items to Be Removed and Reinstalled: Refer to the Construction Drawings.
- D. Existing Items to Remain: All existing features unless noted otherwise in the drawings.

END OF SECTION 013591

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality assurance and control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Requirements:

- 1. Division 01 Section "Allowances" for testing and inspecting allowances.
- 2. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

- 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
- 2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
- 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of three previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
 - 1. Indicate manufacturer and model number of individual components.
 - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 - 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of technical representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 6. Statement whether conditions, products, and installation will affect warranty.
 - 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of factory-authorized service representative making report.
 - 2. Statement that equipment complies with requirements.
 - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 4. Statement whether conditions, products, and installation will affect warranty.
 - 5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect or.
 - Notify Architect and Construction Manager seven days in advance of dates and times when mockups will be constructed.
 - 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
 - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 7. Demolish and remove mockups when directed unless otherwise indicated.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where special inspection services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of 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.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
 - Distribution: Distribute schedule to Owner, Architect, Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.
- 1.11 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and Construction Manager's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Construction Manager, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

- 1. Locations of dust-control partitions at each phase of work.
- 2. HVAC system isolation schematic drawing.
- 3. Location of proposed air-filtration system discharge.
- 4. Waste handling procedures.
- 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- B. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Contractor shall maintain a field office inside the existing building. The field office may be located in the existing vacant office space in the basement. Additional space in the unimproved portions of the basement may also be available for storage and staging. Contractor to coordinate use of the basement with the Owner and building management team.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference space of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.
 - 3. Drinking water and private toilet.

- 4. Coffee machine and supplies.
- 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
- 6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
 - 2. Contractor to exercise extreme caution when connecting or attaching items to the existing building to prevent damage to historic fabric. Any damage caused during construction activities shall be repaired in-kind at no additional cost to the Owner.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

- E. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel.
- G. Internet Connection: Provide temporary internet connection in the common-use facilities for use by construction personnel.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Existing Elevator Use: Use of Owner's existing service elevator will be permitted, provided elevator is cleaned and maintained in a condition acceptable to Owner. Contractor to provide wall pads for temporary protection of the wall panels during construction as recommended by the elevator manufacturer. Use of the existing passenger elevator adjacent to the main lobby is NOT permitted. At Substantial Completion, restore service elevator to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
 - 1. Do not load elevator beyond its rated weight capacity.
 - 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
 - 3. The existing elevator will be used by building tenants during construction. Contractor to maintain operation and access to tenants during construction.
- D. Temporary Use of Permanent Stairs: Limited use of existing stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion. Contractor may use the existing stair next to the service elevator only. Use of the existing stairs next to the 5th Avenue and the existing historic central stair is NOT permitted.
- E. Retain Tenant Signage: Contractor to provide temporary signage for each retail tenant indicating that the business is open during construction. Signage to be weather-resistant canvas type signage listing business name and open during construction. Coordinate mounting location with business tenant and building manager.
- 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- C. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- D. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings. The hotel and retail tenants will remain open during construction Contractor to provide covered walkways and all necessary protection to safely allow the public, tenants, and employees access to the building.
 - 1. Construct covered walkways using scaffold or shoring framing.
 - 2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
 - 3. Paint and maintain appearance of walkway for duration of the Work.
- E. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.
 - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 - 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 3. Insulate partitions to control noise transmission to occupied areas.
 - 4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 - 5. Protect air-handling equipment.
 - 6. Provide walk-off mats at each entrance through temporary partition.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of

interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

- 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
- 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
- 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

B. Related Requirements:

- 1. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
- 2. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

1.6 FINAL COMPLETION PROCEDURES

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- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion
 inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect.
 Certified copy of the list shall state that each item has been completed or otherwise resolved for
 acceptance.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. CSI Form 14.1A.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect and Construction Manager.
 - d. Name of Contractor.
 - e. Page number.
 - 4. Submit list of incomplete items in the following format:
 - a. Three paper copies. Architect, through Construction Manager, will return two copies.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

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D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - d. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - e. Remove labels that are not permanent.
 - f. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - g. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - h. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

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- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

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SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
- B. Related Requirements:
 - 1. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 2. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up record prints.
- B. Record Specifications: Submit one paper copy or annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy or annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or

entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
- b. Accurately record information in an acceptable drawing technique.
- c. Record data as soon as possible after obtaining it.
- d. Record and check the markup before enclosing concealed installations.
- e. Cross-reference record prints to corresponding archive photographic documentation.
- 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Duct size and routing.
 - h. Locations of concealed internal utilities.
 - i. Changes made by Change Order or [Construction] [Work] Change Directive.
 - j. Changes made following Architect's written orders.
 - k. Details not on the original Contract Drawings.
 - 1. Field records for variable and concealed conditions.
 - m. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
- 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Construction Manager.
 - e. Name of Contractor.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 017839

SECTION 030130 - MAINTENANCE OF CAST-IN-PLACE CONCRETE (FOR SIDEWALK RE-TOPPING)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Removal of deteriorated concrete topping and subsequent replacement and patching of sidewalk.
- 2. Polymer modified cementitious repair mortar for sidewalk.
- 3. Oil Resistant Water Repellant Treatment for sidewalk.

B. Related Requirements:

1. Division 07 Section "Fluid-Applied Between Slab Waterproofing."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.
- B. Samples: Cured samples for each exposed product and for each color and texture specified, in manufacturer's standard size appropriate for each type of work.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Each cementitious patching-mortar and water repellant manufacturer shall employ factory-trained technical representatives who are available for consultation and Project-site inspection and assistance at no additional cost.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer to apply packaged patching-mortar materials and water repellant treatment.
- C. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Deck Removal and Patching: Remove and repair an approximately 50 sq. ft. (4.6 sq. m) area of deteriorated concrete deck.
 - 2. Polymer Modified Cementitious Repair Mortar: Apply an approximately 50 sq. ft. (4.6 sq. m) area of polymer overlay.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.
- B. Store cementitious materials off the ground, under cover, and in a dry location.
- C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.

1.6 FIELD CONDITIONS

- A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.
- B. Cold-Weather Requirements for Cementitious Materials: Do not apply unless concrete-surface and air temperatures are above 40 deg F (5 deg C) and will remain so for at least 48 hours after completion of Work.
- C. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F (32 deg C) and above.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain each color, grade, finish, type, and variety of product from single source with resources to provide products of consistent quality in appearance and physical properties.
- B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

2.2 REPAIR MORTAR

- A. Shrinkage compensated, flowable, one-component, polymer-modified cementitious repair mortar containing silica fume and a migratory corrosion inhibitor..
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following or approved equal:
 - a. Euclid Chemical Company (The); Tamms Form and Pout. www.euclidchemical.com.
 - 2. Compressive Strength: Not less than 7,800 psi at 28 days when tested according to ASTM C 109/C 109M.

2.3 BONDING AGENT

- A. Three-component, pre-proportioned, long open time, VOC compliant water based epoxy modified Portland cement bonding agent that does not form a vapor barrier and contains a mgratiry corrosion inhibitor.
 - 1. Products: Subject to compliance with requirements, provide the following or approved equal:
 - a. Euclid Chemical Company (The); Duraprep AC. www.euclidchemical.com.

2.4 OIL RESISTANT WATER REPELLENT

- A. Breathable, UV stable, VOC compliant, ready to use, siloxane water repellent and oil resistant formulation for protecting concrete and masonry.
 - 1. Products: Subject to compliance with requirements, provide the following or approved equal:
 - a. Euclid Chemical Company (The); Baracade WB ORS. www.euclidchemical.com

2.5 MIXES

- A. General: Mix products, in clean containers, according to manufacturer's written instructions.
 - 1. Do not add water, thinners, or additives unless recommended by manufacturer.
 - When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.
 - 3. Do not mix more materials than can be used within time limits recommended by manufacturer. Discard materials that have begun to set.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Ensure that supervisory personnel are on-site and on duty when concrete maintenance work begins and during its progress.
- B. Preparation for Removal of Deteriorated Concrete: Examine construction to be repaired to determine best methods to safely and effectively perform concrete maintenance work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.
 - 1. Verify that affected utilities have been disconnected and capped.
 - 2. Inventory and record the condition of items to be removed for reinstallation or salvage.
 - 3. Provide and maintain shoring, bracing, and temporary structural supports as required to preserve stability and prevent unexpected or uncontrolled movement, settlement, or collapse of construction being demolished and construction and finishes to remain.
- C. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, and surrounding buildings from harm resulting from concrete maintenance work.

- 1. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
- 2. Use only proven protection methods appropriate to each area and surface being protected.
- Provide barricades, barriers, and temporary directional signage to exclude public from areas where concrete maintenance work is being performed.
- 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of concrete maintenance work.
- 5. Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.
- 6. Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.
- 7. Protect floors and other surfaces along haul routes from damage, wear, and staining.
- 8. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.
- 9. Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
- 10. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
- 11. Dispose of debris and runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
- D. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.
 - 1. Prevent solids such as aggregate or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from concrete maintenance work.
 - 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

E. Concrete Removal:

- 1. Provide shoring, bracing, and supports as necessary. Strengthen or add new supports when required during progress of removal work. Do not overload structural elements with debris.
- 2. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch (13 mm). Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.
- 3. Test areas where concrete has been removed by tapping with hammer, and remove additional concrete until unsound and disbonded concrete is completely removed.
- 4. Thoroughly clean removal areas of loose concrete, dust, and debris.

F. WaterProofing:

1. Refer to Section 071210 for Waterproofing application.

3.2 BONDING AGENT

A. Clean surface, mix product, and apply bonding agent per manufacturer's written instructions.

3.3 REPAIR MORTAR

A. Prepare surface, mix product, install, finish, and cure repair mortar per manufacturer's written instructions.

3.4 OIL RESISTANT WATER REPELLENT

A. Prepare surface, mix product, and apply per manufacturer's written instructions.

END OF SECTION 030130

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SECTION 064113 - WOOD-VENEER-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Architectural wood cabinets.
- 2. Wood furring, blocking, shims, and hanging strips for installing architectural wood cabinets unless concealed within other construction before cabinet installation.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 2. Show locations and sizes of cutouts and holes for [electrical switches and outlets] [and other items] installed in architectural wood cabinets.
 - 3. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

B. Samples for Verification:

- 1. Lumber for transparent finish, not less than 5 inches (125 mm) wide by 12 inches (300 mm) long, for each species and cut, finished on one side and one edge.
- 2. Veneer leaves representative of and selected from flitches to be used for transparent-finished cabinets.

1.4 INFORMATIONAL SUBMITTALS

- A. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- B. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

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1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood-veneer-faced architectural cabinets can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET FABRICATORS

A. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of architectural wood cabinets with sequence-matched wood veneers wood doors with face veneers that are sequence matched with woodwork and transparent-finished wood doors that are required to be of same species as woodwork.

2.2 ARCHITECTURAL WOOD CABINETS, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural wood cabinets indicated for construction, finishes, installation, and other requirements.

2.3 WOOD CABINETS FOR TRANSPARENT FINISH

A. Grade: Custom.

B. Type of Construction: Face frame.

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- C. Cabinet and Door and Drawer Front Interface Style: Flush overlay.
- D. Wood for Exposed Surfaces: As indicated.
- E. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- F. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

2.4 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
 - 2. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

2.5 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Hardware: All hinges to be concealed. Provide hardware and mount in locations indicated on the drawings and in the attached cut sheets (refer to FF&E information in the Appendix of these specifications).

2.6 FABRICATION

- A. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Cabinets: 1/16 inch (1.5 mm) unless otherwise indicated.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

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

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
- B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails[or finishing screws] for exposed fastening, countersunk and filled flush with woodwork.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Maintain veneer sequence matching of cabinets with transparent finish.
 - 3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.
- G. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

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

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B. Clean, lubricate, and adjust hardware.

END OF SECTION 064113

SECTION 064600 - WOOD TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Interior standing and running trim.
- 2. Closet and utility shelving.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 2. Apply AWI Quality Certification Program label to Shop Drawings.

B. Samples for Verification:

1. Lumber for transparent finish, not less than 5 inches wide by 12 inches, for each species and cut, finished on one side and one edge.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver wood trim until operations that could damage wood trim have been completed in installation areas. If wood trim must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.5 FIELD CONDITIONS

A. Environmental Limitations for Interior Work: Do not deliver or install interior wood trim until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.6 COORDINATION

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

PART 2 - PRODUCTS

2.1 WOOD TRIM, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.

2.2 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

- A. Grade: Custom.
- B. Wood Species: Any closed-grain hardwood.

2.3 CLOSET AND UTILITY SHELVING

- A. Grade: Custom.
- B. Shelf Material: 3/4-inch (19-mm) medium-density fiberboard with solid-lumber edge.
- C. Cleats: 3/4-inch (19-mm) solid lumber.
- D. Wood Species: Any closed-grain hardwood.
- E. Closet Rods: 1-1/2-inch- (38-mm-) diameter, hardwood.
- F. Rod Flanges: Chrome-plated steel.

2.4 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
 - 2. Wood Moisture Content for Exterior Materials: 9 to 15 percent.
 - 3. Wood Moisture Content for Interior Materials: 5 to 10 percent.

2.5 FABRICATION

- A. Fabricate wood trim to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
- B. Backout or groove backs of flat trim members and kerf backs of other wide, flat members except for members with ends exposed in finished work.

C. Assemble casings in shop except where shipping limitations require field assembly.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition wood trim to average prevailing humidity conditions in installation areas.
- B. Before installing architectural wood trim, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install wood trim to comply with same grade as item to be installed.
- B. Assemble wood trim and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install wood trim level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut wood trim to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 60 inches (1500 mm) long except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.
 - 1. Fill gaps, if any, between top of base and wall with latex sealant, painted to match wall.
 - 2. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).
- F. Touch up finishing work specified in this Section after installation of wood trim. Fill nail holes with matching filler where exposed.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.
- G. Refer to Section 099123 "Interior Painting".

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective wood trim, where possible, to eliminate functional and visual defects; where not possible to repair, replace wood trim. Adjust joinery for uniform appearance.
- B. Clean wood trim on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064600

SECTION 071210 - FLUID-APPLIED BETWEEN SLAB WATERPROOFING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Scope:

- 1. The extent of waterproofing replacement work consists of furnishing everything necessary for, and incidental to, the execution and completion to completely install the new waterproofing system at sidewalk areas indicated on the drawings.
- 2. Waterproofing Contractor shall coordinate with all other trades that directly influence the waterproofing system application, to provide a watertight installation of all waterproofing and waterproofing flashings.
- 3. Contractor shall verify condition of substrate, walls, penetrations, flashings, etc., and shall notify the Consultant, Architect and General Contractor of any discrepancies in the Scope of the Work as shown on the drawings prior to submission of bid.
- 4. General: Provide installed waterproofing membrane and waterproof flashings that remain watertight; do not permit the passage of water; and resist thermally induced movement and exposure to weather without failure.

B. System Description:

- 1. The existing topping and waterproofing materials, inclusive of waterproofing membrane, flashings and sheet metal accessories shall be removed and disposed of down to the concrete substrate in accordance with applicable laws and codes.
- The inspection of the existing concrete substrate and the replacement of any deteriorated or otherwise damaged areas with new to match existing, on a unit cost basis. Deck repairs must be properly supported.
- 3. The new waterproofing system shall consist of a cold, fluid applied, polyurethane based, 100% solids, waterproofing membrane, installed at a minimum thickness of 90 dry mils over the existing concrete substrate. The waterproofing system shall be protected using a lightweight polyester protection mat. To ensure total system compatibility, all products must be obtained from a single source manufacturer.
- 4. The cold fluid-applied polyurethane waterproofing system shall prevent the passage of liquid water under hydrostatic pressure and shall comply with physical and performance requirements of ASTM C 836 as demonstrated by testing performed by an independent testing agency of manufacturer's current waterproofing formulations.

C. Special Project Requirements:

- 1. All work shall be coordinated with the General Contractor to allow work by other trades at the waterproofing areas and to allow closure of the waterproofing areas from subtrade damage.
- 2. The Waterproofing Contractor shall verify that existing substrate conditions are suitable for the proper application of the specified waterproofing prior to starting work. Substrate verification items shall include, but are not limited to, the following:

- a. Verify that existing surfaces are suitably continuous and smooth to allow the installation of the waterproofing materials. Voids, cracks and other noncontinuous conditions must be properly filled.
- b. Verify the substrate surfaces are free from projections. All projections past the substrate surface shall be ground flush.
- c. Minimum penetration spacing shall be verified. Penetrations shall be spaced a minimum of 6 inches from each other, walls, edges, etc. Where proper penetration spacing does not exist, relocation is necessary to create proper spacing.
- d. Verify that waterproofing product to be installed properly adheres to the substrate surfaces. Field testing can be used to verify adhesion.
- e. The waterproofing substrate must be verified as acceptable to receive waterproofing, by the manufacturer, prior to work.
- 3. Preparation work typical to this type of project shall be included in the work. Such preparation shall include the following items:
 - a. The work shall include the use of all necessary surface conditioner or primers to allow complete adhesion of the waterproofing system.
 - b. Installation of sealant or trowel grade waterproofing preparation cant seals shall occur where specified and detailed, and as required by the primary material manufacturer.
- 4. Waterproofing related sheet metal work shall include the fabrication and installation of the following items:
 - a. A minimum 24-gauge, galvanized "L" flashing shall be installed at deck-to-wall junctions.
 - A stucco screed shall be installed associated with the "L" flashing work at the stucco walls.
 - c. Fully soldered corner, threshold and transition pieces shall be installed to tie-in with the "L" flashings.
- 5. Waterproofing work to include or coordinate with wall work and wall repairs, as follows:
 - a. Stucco wall tie-in at the "L" flashing and stucco screed installations.
- 6. The "L" metal flashing installation shall include fabric reinforcement over all seams, edges and fasteners. The fabric reinforcement shall be set into and covered over with coating materials. The same coating materials shall cover the sheet metal "L" flashing to protect metal from moisture. On the vertical leg of the "L" flashing, the coating materials shall be ultraviolet resistant.
- 7. Material manufacturer's rubber reinforcing flashing shall be installed to create a tie-in over the edges of the sidewalk area and onto the vertical below grade wall surfaces (an option for 60 mils neoprene flashing membrane, set into contact adhesive and covered with coating materials instead of the rubber reinforcing flashing will be allowed). The reinforcement tape shall be fully embedded into and covered over with waterproofing membrane. Work to include preparation of the vertical tie-in surfaces to receive the wa-

terproofing.

- 8. All color and finish samples must be submitted to the Architect for approval prior to installation. If Architect approval is not obtained prior to the work, any aesthetic items, which are not satisfactory to the Architect after completion of work, will be the responsibility of the Waterproofing Contractor to repair or replace.
- 9. The Waterproofing Contractor shall anticipate the necessary separate move-ins, to allow for the proper sequencing of the waterproofing design. In the case that separate move-ins are required, the bid shall include the preparation of product installed during the prior move-in to allow proper adhesion of the additional installation. For separate move-ins by the waterproofing contractor, appropriate tie-in protection must be installed as part of this work by the waterproofing contractor to allow continuity with later applications of water-proofing and to result in a complete installation.
- 10. Successful water testing of completed waterproofing shall occur prior to the sidewalk topping pour.

D. Site and Special Applicator Conditions:

- 1. Waterproofing System Criteria: The Applicator shall provide in the cost of his bid all details as required by these specifications, NRCA, SMACNA, ARMA and the primary material manufacturer for the specified guarantee. Typical and custom details not shown herein and that may be required by the primary material manufacturer, Consultant shall be covered by the base bid. Custom details and shop drawings shall be approved in writing by the primary material manufacturer, Architect and Consultant.
- 2. Responsibility for Damage: The Owner, Architect, General Contractor and Consultant connected with the Work shall not be answerable or accountable in any manner: for any loss or damage that may happen to the Work or a part thereof; for any loss or damage to any of the materials or other things used or employed in the performing of the Work; for injury to or death of any person either workman or the public; or for the damage to property from any cause which might have been prevented by the Applicator, or his workman or other workmen, or anyone employed by him or any subcontractor.
- Field Measurements and Material Quantities: Applicator shall have sole responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.
- 4. Applicator must notify Owner, Architect, General Contractor and Consultant of any omissions, contradictions or conflicts 7 days before bid date. Owner, Architect, General Contractor and Consultant will provide necessary corrections or additions to the plans and specifications by addendum. If Applicator does not so notify Owner, Architect, General Contractor and Consultant of any such condition, it will be assumed that the Applicator has included the necessary items in the bid to complete this specification.
- 5. Material Compatibility: Provide waterproofing materials that are compatible with one another under conditions of service and application required, as demonstrated by waterproofing manufacturer based on testing and field experience.
- 6. Independent Roofing Consultants and Heritage Architecture and Planning shall be listed under additionally insured by the awarded Waterproofing Contractor on their liability insurance certificate.

7. Arrange work sequence to avoid damage to the newly-constructed waterproofing. Where access occurs to the waterproofing areas, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas.

E. Unit Cost Items:

1. Provide a separate cost, per square foot, for the replacement of any deteriorated or otherwise damaged concrete substrate to match existing. Work to include support of concrete repairs.

1.2 QUALITY ASSURANCE

- A. Subcontractor shall provide primary products including waterproofing membrane, etc., produced by a single manufacturer and shall provide secondary products acceptable to manufacturer of primary products.
- B. Subcontractor shall have a minimum of 5 years experience in successfully applying the same or similar materials and shall be approved by the materials manufacturer.
- C. Subcontractor shall request the services of a representative of the manufacturer for initial instructions in application of materials. The manufacturer shall supply such service as required at no additional cost to the Owner. The manufacturer's representative shall provide, at a minimum, two (2) site visits per week and issue a letter of findings regarding installation procedures and overall acceptance of area visited.

1.3 APPLICATOR REQUIREMENTS

- A. Subcontractor shall be currently approved and licensed by the manufacturer of the waterproofing materials to be used. Subcontractor shall use only skilled workers completely familiar with the products and the manufacturer's current recommended methods of installation.
- B. Except as modified and supplemented herein, Subcontractor shall follow the published requirements and written recommendations of the manufacturer of the waterproofing system and other material manufacturers. Concerning methods of installation, industry practices apply only when this Section does not address the matter.
- C. If, in the opinion of the Subcontractor, any work is indicated on drawings or specified in such a manner as to make it impossible to produce guaranteed and warranted work of the highest quality, or should discrepancies appear from one drawing to another, or between drawings and specifications, the Subcontractor shall advise the Contractor in writing before proceeding.

1.4 PRE-JOB MEETINGS

- A. Pre-Waterproofing Conference:
 - 1. Prior to installation of the waterproofing system, representatives of the following entities are required to meet at the project site: Owner, Architect, General Contractor, Waterproofing
 - Subcontractor, Materials Manufacturer and representatives of other entities directly concerned with installation or performance of the waterproofing system.
 - 2. Attendees shall review all pertinent details and specifications, note any potential problems and make any changes, deletions or additions in writing as deemed necessary. Also included in the discussion will be the following: Nature and availability of waterproof-

ing materials, guarantee and submittal requirements, scheduling and forecast weather conditions, regulatory requirements, completed waterproofing system, proposed installation procedures and any additional items related to the total waterproofing system.

- 3. Where possible, attendees shall tour waterproofing areas and discuss general conditions including waterproofing slope, wall and penetration flashing details, drainage, and materials compatibility.
- 4. Discussion will be recorded, including agreement or disagreement on matters of significance. All matters in question or disagreements will be resolved in writing prior to commencing any work. A copy of the recorded discussion will be furnished to all attendees.

1.5 SUBMITTALS

- A. Not later than 10 days after contract is issued (approval must occur prior to the Pre-Job Conference and must be approved by Architect prior to Notice to Proceed being issued):
 - 1. Membrane Submittals:
 - Testing: Manufacturer verification that their materials meet the physical performance characteristics and the ASTM requirements indicated in this specification.
 - b. Manufacturer product information and installation guideline specifications for all products to be used on project.
 - c. Membrane material manufacturer must provide the names, locations and contact persons of the installations of its material over 10 years old which are still performing in the Southern California area.
 - d. Contractor shall submit material Manufacturer's Product Data Sheets for each product to be utilized in the installation of the specified waterproofing assembly, including membrane, fasteners, primer and sealants. He shall include data substantiating that materials comply with specified requirements. This certification is to be obtained prior to commencement of application.
 - 2. Submit Manufacturer's Product Data Sheet and Material Safety Data Sheet (MSDS) information on all products to be used on the project. Where contents of submitted literature from manufacturers include data not pertinent to the submittal, clearly indicate which portions of the contents are being submitted for review.
 - 3. A detailed work plan indicating number of work days; for each work day the crew size and activities to be accomplished; intended disposal location; specific start and stop work times on site and such other information appropriate for the Consultant to determine that the Applicator has adequately planned the work.
 - 4. Before any waterproofing materials are delivered to the job site, Applicator shall submit a letter from the manufacturer that they are an approved certified applicator to install the specified system. Also, a letter from the manufacturer for intent to guarantee the waterproofing system at this project per guarantee requirements specified shall be provided.
 - 5. Waterproofing material manufacturer shall provide a letter of waterproofing substrate acceptance along with detail compliance for issuance of guarantee.

- 6. Applicator shall submit shop drawings verifying the construction of all sheet metal accessories and components, including, but not limited to the threshold flashing and "L" metal flashings.
- Aesthetic submittals for all finishes must be submitted for approval by the Architect prior to work.
- 8. Upon completion of the waterproofing installation, the completed Waterproofing Contractor Certification shall be provided to the Architect as a part of required close-out submittals

1.6 PRODUCT HANDLING

A. Subcontractor shall:

- 1. Deliver all waterproofing system materials in original, unopened manufacturer labeled packages to locations(s) as directed by Contractor.
- 2. When stored outdoors, store all materials on pallets. Totally cover materials stored outside using a breathable watertight covering. Extend covering down to the pallet so that no materials remain exposed, and properly secure to resist wind uplift. Visqueen or other non-breathable plastic coverings will be used at the Subcontractor's risk. Unprotected, moist or otherwise damaged materials or materials with evidence of moisture damage, will be conspicuously marked for permanent removal from the job.
- 3. Select and handle material handling equipment to avoid damage to materials or applied waterproofing.
- 4. Inspect all materials for conformance to specifications. Materials found that are not approved or do not meet required standards will be marked as rejected and permanently removed from the job site on an immediate basis.
- 5. Verify that all materials are protected before, during and after arrival at the job site. Verify that all materials have been adequately protected from moisture damage while in transition.

1.7 JOB CONDITIONS

A. Subcontractor shall:

1. Conditions:

- a. Construction may not be as shown on the drawings and some modification of details may be required to accomplish the intent of the documents. Subcontractor must receive approval in writing from Architect via the Contractor for all modifications or adjustments before commencing with the work.
- b. Before any waterproofing work is started, thoroughly examine all surfaces for deficiencies. Should deficiencies exist, the Architect, via the Contractor, shall be notified in writing and corrections made prior to commencing with work.
- 2. Environmental Requirements:

- a. Do not proceed with application of materials when deck temperature is less than 40° F.
- b. Do not apply materials unless surface to receive coating is clean and dry, or if precipitation is imminent. If inclement weather is anticipated during the work period, take adequate precautions to insure that materials and applied water-proofing are protected from possible moisture damage or contamination.

3. Safety and Health Conditions:

- a. During coating application, it is essential that maximum effort is made to protect the coating mechanic and others near the workplace from breathing vapors and coming in contact of material with skin or eyes.
- b. In confined areas, the best form of protection against organic solvents or other potentially sensitizing vapors is a fresh air supply. For maximum protection, it is recommended to use a NIOSH/MSHA approved self-contained breathing apparatus with a full-face piece operated in a positive pressure mode.
- c. In unrestricted (open outdoor) areas, it is recommended to wear a suitable mask or respirator of a type approved by NIOSH/MSHA.
- d. To prevent excessive skin contact with the material, it is recommended to use fabric coveralls and neoprene or other resistant gloves. To prevent eye contact, wear a full-face mask or OSHA approved protective goggles.

4. Protection:

- a. Keep products away from heat, sparks and flames. Do not allow use of spark producing equipment during application and until vapors are gone. Post "No Smoking" signs.
- b. The solvents from coating materials can carry considerable distances and care should be taken to do the following:
 - (1) Post warning signs a minimum of 100 feet from the work area.
 - (2) Cover all intake vents near the work area.
 - (3) Minimize or exclude all personnel not directly involved with the coating application.
 - (4) Have CO2 or other dry chemical fire extinguishers available the job site.
 - (5) Provide adequate ventilation.
- c. After completion of application, do not allow traffic above or adjacent the coated surfaces until the coating material has cured and the protection course is in place.
- d. Remove debris daily from the waterproofing area and haul off site.

e. Immediately repair or replace all damaged and/or defective work to the approval of the Architect, Waterproofing Consultant and Contractor. The repair of damaged or defective work shall be performed at no additional cost to the Owner or Contractor, unless the Subcontractor's protected work in place is damaged by others beyond his reasonable control.

1.8 REGULATORY REQUIREMENTS

- A. Conform to regulations of public agencies, including any specific requirements of the city and state of jurisdiction, including the following:
 - 1. American Society for Testing and Materials (ASTM).
 - 2. Canadian Government Specification Board (CGSB) 37-TP-50M, Standard for "Asphalt, Rubberized, Hot Applied, for Roofing and Waterproofing".
 - 3. Underwriters Laboratories (U.L.) Class "A".
 - 4. The Tile Institute of America.
 - 5. Conform to regulations of public agencies, including any specific requirements of the city and state of jurisdiction.

1.9 GUARANTEES

A. Subcontractor Guarantee:

1. The Waterproofing Subcontractor shall guarantee the installation of waterproofing system and flashing to be watertight for a period of 5 years from the date of substantial completion of the waterproofing project. The Subcontractor shall make all repairs during this guarantee period to maintain the waterproofing watertight and in conformance with these specifications without additional cost to the Owner or Contractor. Without invalidating or voiding any portion of the guarantee, the Owner and/or Contractor has the right, in the case of emergency at any time during this guarantee period and without invalidating this guarantee, to make any temporary repairs that are required in order to protect the building and the contents of the building from damage due to leakage through the installed waterproofing system.

B. Manufacturer Guarantee:

1. In addition to the Subcontractor's Guarantee, the Manufacturer shall furnish a 10-Year Joint Guarantee covering any and all repairs required to keep the waterproofing, including the field and flashings, watertight for 10 years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS AND SYSTEMS

- A. This specification has been compiled on product performance criteria and not on system criteria. Evaluation of submittals shall be solely based on a product comparison to the specified materials.
- B. All components must be obtained as a single source from the membrane manufacturer to ensure total system compatibility and integrity. The following are acceptable manufacturers and systems

for this project:

Tremco Global Sealants, 3735 Green Road, Beachwood OH.
 Local Representative: Mr. Alan Cantarini. Phone 949-246-0733.

 E-mail: ACantarini@cox.net Website: www.tremcosealants.com

2.2 WATERPROOFING MEMBRANE MATERIALS

- A. Fluid Applied Waterproofing Membrane: Tremco manufactured Tremproof 250 GC. Membrane shall be an aliphatic, rapid curing, high solids, VOC compliant, modified polyurethane waterproofing membrane that can be applied to green or damp concrete: Material must meet ASTM C836 requirements.
- B. Ultraviolet Resistant Fluid Applied Waterproofing Membrane: Tremco manufactured Vulkem 801.

C. Primers:

- 1. For over protection coat or other intermittent applications: Tremco, Vulkem 191 Primer.
- 2. For metal: Tremco, Tremprime non-porous surfaces primer.
- 3. For concrete/masonry surfaces: Tremco, Tremprime porous surfaces primer.

D. Flashing/Reinforcing:

- 1. Membrane Flashings:
 - a. Rubber Reinforcing Flashing: Tremco manufactured DualFlex.
 - b. Neoprene Flashing Membrane: (option in lieu of rubber reinforcing flashing) 60 mils (1.5 mm) thick, uncured neoprene flashing/reinforcing sheet.
- Reinforcing Fabric: Spunbonded polyester fabric reinforcing sheet (Tremco reinforcing fabric).
- 3. Sheet Metal:
 - a. Galvanized Iron: Shall be 24-gauge or as otherwise specified or shown on the drawings, meeting ASTM A 526, G-90 coating designation.
 - b. Soldering flux shall conform to Federal Specification O-F-506C, Type I Form A or B.
 - c. Solder shall conform to ASTM B 32-70 alloy grade 58: 50% tin, 50% lead.

D. Adhesives:

1. Adhere neoprene flashing and neoprene flashing laps using Tremproof 250 GC or manufacturer approved contact adhesive.

E. Protection Material:

Polyester Protection Mat: Tremco Protection Mat, 14 ounce polyester protection material.

2.3 MISCELLANEOUS

A. Fasteners:

- 1. Termination Bar: Pre-punched, 8" on center, flat, aluminum termination bar, preengineered by the primary manufacturer.
- 2. Sheet Metal to Concrete: Specially threaded anchors, brand name "Hilti", 3/16" minimum diameter, length to penetrate minimum 1-1/2" through the concrete and having a flushed head pin.
- 3. Stainless steel hose clamps for membrane flashing boot securement at pipe penetrations.

B. Sealants:

- 1. Trowel Grade Sealant: Tremco, Tremproof 250 GC T.
- Vertical Applications: Single component, non-sag, low modulus, moisture-curing polyurethane sealant, conforming with Federal Specification TT-S-00230C, Type II, Class A, such as Tremco, Vulkem 921 or Sikaflex-15LM and as approved by the primary material manufacturer.
- 3. Horizontal Applications: Two (2) component, self-leveling, polyurethane sealant, conforming with ASTM C 920-79, Type M, Grade P, Class 25, such as Sikaflex 2C SL and as approved by the primary material manufacturer.
- C. Cleaner Material: Only as allowed by manufacturer.
- D. Bond Breaker Tape: as approved by waterproofing material manufacturer.
- E. Waterstop: Manufacturer's Bentonite Waterstop, Superstop, as manufactured by Tremco.

PART 3 - EXECUTION

3.1 INSPECTION

- A. The Contractor shall examine all surfaces to receive the waterproofing assembly to verify it is acceptable and proper for the application of the membrane. Should deficiencies exist, the General Contractor and Architect shall be notified in writing and corrections made prior to commencing with work.
- B. The Contractor shall not proceed with the installation of the membrane assembly until all defects have been corrected.
- C. The Contractor shall verify that all surfaces that will be covered with the waterproofing membrane shall be clean, dry and free of loose paint, rust or other contaminants.

3.2 PREPARATION

A. Etching: Treat concrete surfaces with 10% to 15% solution of muriatic acid to remove impurities. After acid has stopped foaming or boiling, immediately rinse thoroughly with water. Re-rinse as required to remove muriatic acid solution. If acid etching is not practical, steel shot blasting is an acceptable alternative, however, proper care and procedure should be taken to leave the concrete

surface as unopened as possible.

- B. All surfaces to receive waterproofing shall be cleaned prior to coating application. Surfaces contaminated with oil, grease or other contaminants shall be cleaned in an appropriate manner to remove all contamination and ensure a positive bond. All surfaces must be dry, smooth, free of depressions, voids, protrusions and clean and free of surface contaminants.
- C. Cracks and Cold Joints: Visible hairline cracks (up to 1/16 inch in width) in concrete and cold joints shall be routed out and filled with urethane sealant, then cleaned, primed and treated with polyurethane coating material a minimum distance of 2 inches on each side of crack to yield a total thickness of 30 dry mils. Large cracks (over 1/16 inch in width) in concrete shall be routed out and filled with urethane sealant and detailed with 60-mil elastomeric sheet flashing material.
- D. Control Joints: Seal secondary control joints with primer sealant or sealant approved by manufacturer. Sealant shall be applied to inside area of joint only, not applied to deck surface. Prime concrete and detail sealed joints with polyurethane coating material a distance of 2 inches on each side of joint to yield a total thickness of 30 dry mils.
- E. Any priming required by the material manufacturer shall be accomplished.
- F. Install a minimum 1-inch, trowel grade sealant cant or urethane sealant cant at all corner locations, horizontal or vertical and all transitions between penetrations and walls. Prime all areas to receive trowel grade sealant with specified primer.
- G. Clean metal surfaces to bright metal by wire brushing or mechanical etching. Roughen lead and plastic surfaces at the seal areas with sandpaper prior to cant installation.
- H. Mask any areas not to receive coating using masking tape.

3.3 FLASHINGS

- A. Sheet Metal Flashings:
 - 1. Install sheet flashings where indicated on the drawings prior to the application of the waterproofing membrane. Set sheet metal flashings into a bed of urethane sealant and fasten flashing flanges 6 inches on center, staggered near the edge of flashing flange, in locations that allow coverage by reinforcing fabric (approximately 1-1/4, 3/4-inch in from leading edge of the flashing).
 - 2. Prime sheet metal with manufacturer recommended primer and allow primer to dry in accordance with manufacturer requirements.
 - 3. Preparation trowel grade sealant cant application shall be installed after sheet metal flashing preparation to allow sheet metal flashings to properly fit against existing surfaces.
- B. Fabric Flashings:
 - Install minimum 20 dry mils of fluid applied waterproofing membrane to cover the properly primed sheet metal flashings, including vertical legs and extending a minimum 4 inches onto the deck surface. Immediately embed reinforcing fabric into the coating while the coating is still wet. Reinforcing fabric shall be installed along the edge of sheet metal flashing flanges such that the edges of the flashing and the flashing fasteners are completely covered and reinforced. Reinforcing fabric shall also be installed to cover joints in the sheet metal flashings.

- 2. After first flashing coat has cured, cover over the sheet metal flashings and reinforcing fabric using fluid applied waterproofing. Edge of fluid applied waterproofing application onto the deck surface shall be feathered.
- 3. At locations which can be exposed, such as vertical legs of sheet metal "L" flashings, the ultraviolet resistant fluid applied waterproofing membrane shall be used to accomplish the above requirements.

C. Membrane Flashings:

- Install membrane flashings where indicated on the drawings prior to the application of
 waterproofing membrane and after preparation work including the trowel grade sealant
 cant preparation. Install membrane flashings into fluid applied waterproofing membrane
 or manufacturer approved adhesive such that the edges of the membrane flashings are
 completely embedded without blisters, bubbles or voids.
- 2. Secure membrane flashings where indicated on the drawings with waterproofing manufacturer's termination bar. Termination bar installations shall be completely encased in sealant or fluid applied waterproofing membrane.
- 3. If applicable, the membrane flashings shall be used to create boot flashings at all penetrations. The top edges of boot flashings shall be secured using stainless steel hose clamps.
- D. Any voids, where flashings are not completely embedded, must be cut out and affected flashing materials replaced.
- E. Other detailing, reinforcement and flashings shall be done in accordance with the manufacturer's standard guideline details and the project drawings.

3.4 MEMBRANE INSTALLATION

- A. Allow all preparation coating and trowel grade membrane and sealant used for preparation work and for flashing work to cure (soft cure) (allow minimum of 12 hours) prior to membrane application.
- B. Install the 90 dry mils of membrane in individual coats, as is necessary to prevent gas bubbles and pinholes. The 90 dry mils of membrane is often installed in three 30 dry mils thick coats. In addition to the thickness of each coat being limited by gas bubbles and pinholes, the application must be in conformance to manufacturer's requirements.
- C. For 30 dry mils thick membrane coats, a nominal rate of 2 gallons per 100 square feet is anticipated, or as necessary to result in a minimum thickness of 30 dry mils. Allow each coat to cure prior to installation of next coat.
- D. Where waterproofing layers or tie-in areas occur that cure such that the applied waterproofing surfaces are no longer tacky, additional cleaning and preparation must occur prior to additional overlying coating layers. Additional cleaning and preparation shall include thorough cleaning and priming in accordance with the primary material manufacturer requirements to result in an acceptable surface for membrane application. Cleaning may include a solvent wipe to activate the surface of the applied coating and ensure a bond occurs between all waterproofing layers.

3.5 WATER TEST

- A. Contractor shall perform a water test after membrane has sufficiently cured. The performance of a successful water test must occur prior to covering membrane with protection material and sidewalk pour.
- B. Results of water test shall be documented and forwarded to the Architect. Repairs shall occur in the case of an unsuccessful water test. The repairs required by waterproofing material manufacturer which may be necessary after water test shall be performed at no additional cost to Owner. After repairs are completed, repeat water test until a successful water test occurs.

3.6 PROTECTION MATERIAL INSTALLATION

- A. After the successful water test of the installed waterproofing membrane occurs, install the protection material. As necessary, install a thin coat of fluid applied waterproofing membrane to adhere protection material.
- B. Protection material must be continuous prior to sidewalk pour. Fabric must be overlapped a minimum of 2 inches. Secure edges of protection material fabric at all penetrations to result in full coverage.
- C. Waterproofing Contractor shall examine the waterproofing area to be covered with subsequent backfill/overburden materials in order to insure that all waterproofing areas have received the membrane, the membrane is free of damage, it is properly protected and all flashing has been properly installed.

3.7 CLEAN-UP

- A. Promptly remove primer or membrane system material from adjacent surfaces with MEK, Toluene or Xylene; leave work area in broom clean condition.
- B. Prohibit traffic over completed work and protect against work overhead until protection course is installed; protect from damage until protected beneath overlaying work.

3.8 INSPECTION

- A. A Waterproofing and Quality Control Consultant (hereinafter also referred to as Consultant and/or Independent Roofing Consultants) shall be retained by the Owner to provide quality control services. Duties and functions of the Quality Controller shall include inspection of the waterproofing system installation.
- B. As the Waterproofing Contractor's work progresses, at intervals approved by the Waterproofing Consultant and Owner's Representative, Manufacturer's Representative, shall make progress inspection(s) of the completed-to-date waterproofing system, etc. Deficiencies or incomplete work items will be noted at this time and documented. A punchlist of all such items will be issued to the Waterproofing Contractor for immediate correction. The membrane thickness must be identified by the manufacturer during their inspections.

END OF SECTION 071210

WATERPROOFING CONTRACTOR CERTIFICATION

Project Name:		
Building No./Address:		
Date of Installation:		
Waterproofing Manufacturer:		
WATERPROOFING CERTIFICATION	ī:	
	this project, I certify that the specified waterproofing staturer's published criteria, project specifications, and draw	
Name of Subcontractor's Company:		
Name of Principal in Subcontractor's Co	mpany:	
Signature of Principal:	Date:	

SECTION 071850 - FLUID-APPLIED ELASTOMERIC DECK COATING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Scope:

- 1. The extent of waterproofing replacement work consists of furnishing everything necessary for, and incidental to, the execution and completion of a fluid applied elastomeric deck coating system on the Palm Deck of this project.
- 2. Waterproofing Contractor shall coordinate with all other trades that directly influence the waterproofing system application, to provide a watertight installation of all waterproofing and waterproofing flashings.
- 3. Contractor shall verify condition of substrate, walls, penetrations, flashings, etc., and shall notify the Consultant, Architect and General Contractor of any discrepancies in the Scope of the Work as shown on the drawings prior to submission of bid.
- 4. General: Provide installed waterproofing system and waterproof flashings that remain watertight; do not permit the passage of water; and resist thermally induced movement and exposure to weather without failure.

B. System Description:

- 1. The existing roofing and wood decking, inclusive of roofing membrane, flashings and sheet metal accessories shall be removed and disposed of down to the wood plank substrate in accordance with applicable laws and codes.
- The inspection of the existing wood plank substrate and the replacement of any deteriorated or otherwise damaged areas with new to match existing, on a unit cost basis, including deck supports.
- 3. The installation of new plywood substrate shall occur over the wood plank deck.
- 4. The fluid-applied elastomeric deck coating waterproofing system shall consist of a liquid-applied polyurethane base membrane installed in multiple coats over the primed concrete deck. Over the polyurethane base membrane shall be a layer of liquid-applied elastomeric polyurethane membrane covered with aggregate, followed by a top coat of the elastomeric membrane. The system shall be a minimum 54 dry mils less aggregate. Color per the Architect. To ensure total system compatibility, all products must be obtained from a single source manufacturer.
- 4. The fluid-applied elastomeric deck coating waterproofing system shall prevent the passage of liquid water under hydrostatic pressure and shall comply with physical and performance requirements of ASTM C 836 as demonstrated by testing performed by an independent testing agency of manufacturer's current waterproofing formulations.

C. Special Project Requirements:

1. All work shall be coordinated with the General Contractor to allow work by other trades at the waterproofing areas and to allow closure of the waterproofing areas from subtrade damage.

- 2. The Waterproofing Contractor shall verify that existing substrate conditions are suitable for the proper application of the specified waterproofing prior to starting work. Substrate verification items shall include, but are not limited to, the following:
 - a. Verify that existing surfaces are suitably continuous and smooth to allow the installation of the waterproofing materials.
 - b. Verify that appropriate screw type fasteners have been used to secure the new plywood.
 - If tongue and groove plywood is not used, verify that all deck joints are fullyblocked.
 - d. The Waterproofing Contractor shall verify that ponding conditions do not exist on the waterproofing substrate prior to the installation of waterproofing. If ponding areas exist, they shall be brought to the attention of the Architect for immediate resolution.
 - e. Verify installations of drains have occurred and that drains are acceptable for waterproofing application.
 - f. All base flashing and wall covering backing must be continuous and ready to receive waterproofing application.
 - g. Verify that waterproofing product to be installed properly adheres to the substrate surfaces. Field testing can be used to verify adhesion.
 - h. The waterproofing substrate must be verified as acceptable to receive waterproofing, by the manufacturer, prior to work.
- 3. Preparation work typical to this type of project shall be included in the work. Such preparation shall include the following items:
 - a. The work shall include the use of all necessary surface conditioner or primers to allow complete adhesion of the waterproofing system.
 - b. Joints in the plywood deck and plywood deck fasteners shall be detailed with a reinforcing fabric, embedded into specified sealant and covered over with the coating materials.
 - c. Installation of sealant preparation cant seals shall occur where specified and detailed, and as required by the primary material manufacturer.
- 4. Waterproofing related sheet metal work shall include the fabrication and installation of the following items:
 - a. A minimum 24-gauge, galvanized "L" flashing shall be installed at deck-to-wall junctions.
 - b. A stucco screed shall be installed associated with the "L" flashing work at the stucco walls.
 - c. Fully soldered corner, threshold and transition pieces shall be installed to tie-in with the "L" flashings.

- 5. Waterproofing work to include or coordinate with wall work and wall repairs, as follows:
 - a. Stucco wall tie-in at the "L" flashing and stucco screed installations.
- 6. The "L" metal flashing installation shall include reinforcing fabric over all seams, edges and fasteners. The fabric reinforcement shall be set into and covered over with coating materials. The same coating materials shall cover the sheet metal "L" flashing to protect metal from moisture.
- 7. Deck drains shall be installed to replace existing roof drains. The deck drains shall be appropriate to receive waterproofing system specified.
- 8. Splash blocks shall be installed over the waterproofing membrane at drain outlet pipes that drain onto this roof section.
- 9. All color and finish samples must be submitted to the Architect for approval prior to installation. If Architect approval is not obtained prior to the work, any aesthetic items, which are not satisfactory to the Architect after completion of work, will be responsibility of the Waterproofing Contractor to repair or replace.
- 10. The Waterproofing Contractor shall anticipate the necessary separate move-ins, to allow for the proper sequencing of the waterproofing design. In the case that separate move-ins are required, the bid shall include the preparation of product installed during the prior move-in to allow proper adhesion of the additional installation. For separate move-in's by the waterproofing contractor, appropriate tie-in protection must be installed as part of this work by the waterproofing contractor to allow continuity with later applications of waterproofing and to result in a complete installation.
- 11. Successful water testing of completed waterproofing shall occur prior to final acceptance.
- D. Site and Special Applicator Conditions:
 - 1. Waterproofing System Criteria: The Applicator shall provide in the cost of his bid all details as required by these specifications, NRCA, SMACNA, ARMA and the primary material manufacturer for the specified guarantee. Typical and custom details not shown herein and that may be required by the primary material manufacturer, Consultant shall be covered by the base bid. Custom details and shop drawings shall be approved in writing by the primary material manufacturer, Architect and Consultant.
 - 2. Responsibility for Damage: The Owner, Architect, General Contractor and Consultant connected with the Work shall not be answerable or accountable in any manner: for any loss or damage
 - that may happen to the Work or a part thereof; for any loss or damage to any of the materials or other things used or employed in the performing of the Work; for injury to or death of any person either workman or the public; or for the damage to property from any cause which might have been prevented by the Applicator, or his workman or other workmen, or anyone employed by him or any subcontractor.
 - Field Measurements and Material Quantities: Applicator shall have sole responsibility for accuracy of all measurements, estimates of material quantities and sizes and site conditions that will affect work.
 - 4. Applicator must notify Owner, Architect, General Contractor and Consultant of any omissions, contradictions or conflicts 7 days before bid date. Owner, Architect, General

Contractor and Consultant will provide necessary corrections or additions to the plans and specifications by addendum. If Applicator does not so notify Owner, Architect, General Contractor and Consultant of any such condition, it will be assumed that the Applicator has included the necessary items in the bid to complete this specification.

- 5. Material Compatibility: Provide waterproofing materials that are compatible with one another under conditions of service and application required, as demonstrated by waterproofing manufacturer based on testing and field experience.
- 6. Independent Roofing Consultants and Heritage Architecture and Planning shall be listed under additionally insured by the awarded Waterproofing Contractor on their liability insurance certificate.
- 7. Arrange work sequence to avoid damage to the newly-constructed waterproofing. Where access occurs to the waterproofing areas, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas.

E. Unit Cost Items:

- 1. Provide a separate cost, per lineal foot, for the replacement of any deteriorated or otherwise damaged wood plank substrate to match existing.
- 2. Provide a separate cost, per member, for the replacement of any damaged or otherwise deteriorated subpurlins with new 2-inch x 6-inch Douglas Fir #1 grade subpurlins. Quoted cost to include installation of new (2) Simpson hangers.
- 3. Provide a separate cost, per waterproofing deck drain, for installation of new, waterproofing deck drains. Remove and re-install decking as necessary to accomplish proper installation of the waterproofing deck drain assembly (this cost is separate from the drains required in the base bid).
- 4. Provide a separate cost, per lineal foot, for installation of new roof drain lines to tie into existing drain lines. Size of new drain lines shall match that of existing (this cost is separate from the drain lines required in the base bid).

1.2 QUALITY ASSURANCE

- A. Subcontractor shall provide primary products including waterproofing membrane, etc., produced by a single manufacturer and shall provide secondary products acceptable to manufacturer of primary products.
- B. Subcontractor shall have a minimum of 5 years experience in successfully applying the same or similar materials and shall be approved by the materials manufacturer.
- C. Subcontractor shall request the services of a representative of the manufacturer for initial instructions in application of materials. The manufacturer shall supply such service as required at no additional cost to the Owner. The manufacturer's representative shall provide, at a minimum, two (2) site visits per week and issue a letter of findings regarding installation procedures and overall acceptance of area visited.

1.3 APPLICATOR REQUIREMENTS

A. Subcontractor shall be currently approved and licensed by the manufacturer of the waterproofing materials to be used. Subcontractor shall use only skilled workers completely familiar with the products and the manufacturer's current recommended methods of installation.

- B. Except as modified and supplemented herein, Subcontractor shall follow the published requirements and written recommendations of the manufacturer of the waterproofing system and other material manufacturers. Concerning methods of installation, industry practices apply only when this Section does not address the matter.
- C. If, in the opinion of the Subcontractor, any work is indicated on drawings or specified in such a manner as to make it impossible to produce guaranteed and warranted work of the highest quality, or should discrepancies appear from one drawing to another, or between drawings and specifications, the Subcontractor shall advise the Contractor in writing before proceeding.

1.4 PRE-JOB MEETINGS

A. Pre-Waterproofing Conference:

- 1. Prior to installation of the waterproofing system, representatives of the following entities are required to meet at the project site: Owner, Architect, General Contractor, Waterproofing Subcontractor, Materials Manufacturer and representatives of other entities directly concerned with installation or performance of the waterproofing system.
- 2. Attendees shall review all pertinent details and specifications, note any potential problems and make any changes, deletions or additions in writing as deemed necessary. Also included in the discussion will be the following: Nature and availability of waterproofing materials, guarantee and submittal requirements, scheduling and forecast weather conditions, regulatory requirements, completed waterproofing system, proposed installation procedures and any additional items related to the total waterproofing system.
- 3. Where possible, attendees shall tour waterproofing areas and discuss general conditions including waterproofing slope, wall and penetration flashing details, drainage, and materials compatibility.
- 4. Discussion will be recorded, including agreement or disagreement on matters of significance. All matters in question or disagreements will be resolved in writing prior to commencing any work. A copy of the recorded discussion will be furnished to all attendees.

1.5 SUBMITTALS

A. Not later than 10 days after contract is issued (approval must occur prior to the Pre-Job Conference and must be approved by Architect prior to Notice to Proceed being issued):

1. Membrane Submittals:

- Testing: Manufacturer verification that their materials meet the physical performance characteristics and the ASTM requirements indicated in this specification.
- b. Manufacturer product information and installation guideline specifications for all products to be used on project.
- c. Membrane material manufacturer must provide the names, locations and contact persons of the installations of its material over 10 years old which are still performing in the Southern California area.

- d. Contractor shall submit material manufacturer's product data sheets for each product to be utilized in the installation of the specified waterproofing assembly, including membrane, fasteners, primer and sealants. He shall include data substantiating that materials comply with specified requirements. This certification is to be obtained prior to commencement of application.
- 2. Submit Manufacturer's Product Data Sheet and Material Safety Data Sheet (MSDS) information on all products to be used on the project. Where contents of submitted literature from manufacturers include data not pertinent to the submittal, clearly indicate which portions of the contents are being submitted for review.
- 3. A detailed work plan indicating number of work days; for each work day the crew size and activities to be accomplished; intended disposal location; specific start and stop work times on site and such other information appropriate for the Consultant to determine that the Applicator has adequately planned the work.
- 4. Before any waterproofing materials are delivered to the job site, Applicator shall submit a letter from the manufacturer that they are an approved certified applicator to install the specified system. Also, a letter from the manufacturer for intent to guarantee waterproofing system at this project per guarantee requirements specified shall be provided.
- 5. Waterproofing material manufacturer shall provide a letter of waterproofing substrate acceptance along with detail compliance for issuance of guarantee.
- 6. Applicator shall submit shop drawings verifying the construction of all sheet metal accessories and components, including, but not limited to, the threshold flashing and "L" metal flashings.
- Aesthetic submittals for all finishes must be submitted for approval by the Architect prior to work.
- 8. Upon completion of the waterproofing installation, the completed Waterproofing Contractor Certification shall be provided to the Architect as a part of required close-out submittals.

1.6 PRODUCT HANDLING

A. Subcontractor shall:

- 1. Deliver all waterproofing system materials in original, unopened manufacturer labeled packages in locations(s) as directed by Contractor.
- 2. When stored outdoors, store all materials on pallets. Totally cover materials stored outside using a breathable watertight covering. Extend covering down to the pallet so that no materials remain exposed, and properly secure to resist wind uplift. Visqueen or other non-breathable plastic coverings will be used at the Subcontractor's risk. Unprotected, moist or otherwise damaged materials or materials with evidence of moisture damage will be conspicuously marked for permanent removal from the job.
- 3. Select and handle material handling equipment to avoid damage to materials or applied waterproofing.
- 4. Inspect all materials for conformance to specifications. Materials found that are not approved or do not meet required standards will be marked as rejected and permanently removed from the job site on an immediate basis.

5. Verify that all materials are protected before, during and after arrival at the job site. Verify that all materials have been adequately protected from moisture damage while in transition.

1.7 JOB CONDITIONS

A. Subcontractor shall:

1. Conditions:

- a. Construction may not be as shown on the drawings and some modification of details may be required to accomplish the intent of the documents. Subcontractor must receive approval in writing from Architect via the Contractor for all modifications or adjustments before commencing with the work.
- b. Before any waterproofing work is started, thoroughly examine all surfaces for deficiencies. Should deficiencies exist, the Architect via the Contractor shall be notified in writing and corrections made prior to commencing with work.

2. Environmental Requirements:

- a. Do not proceed with application of materials when deck temperature is less than 40° F.
- b. Do not apply materials unless surface to receive coating is clean and dry, or if precipitation is imminent. If inclement weather is anticipated during the work period, take adequate precautions to insure that materials, and applied water-proofing are protected from possible moisture damage or contamination.

3. Safety and Health Conditions:

- a. During coating application, it is essential that maximum effort is made to protect the coating mechanic and others near the workplace from breathing vapors and coming in contact of material with skin or eyes.
- b. In confined areas, the best form of protection against organic solvents or other potentially sensitizing vapors is a fresh air supply. For maximum protection, it is recommended to use a NIOSH/MSHA approved self-contained breathing apparatus with a full face-piece operated in a positive pressure mode.
- c. In unrestricted (open outdoor) areas, it is recommended to wear a suitable mask or respirator of a type approved by NIOSH/MSHA.
- d. To prevent excessive skin contact with the material, it is recommended to use fabric coveralls and neoprene or other resistant gloves. To prevent eye contact, wear a full-face mask or OSHA approved protective goggles.

4. Protection:

a. Keep products away from heat, sparks and flames. Do not allow use of spark producing equipment during application and until vapors are gone. Post "No Smoking" signs.

- b. The solvents from coating materials can carry considerable distances and care should be taken to do the following:
 - (1) Post warning signs a minimum of 100 feet from the work area.
 - (2) Cover all intake vents near the work area.
 - (3) Minimize or exclude all personnel not directly involved with the coating application.
 - (4) Have CO2 or other dry chemical fire extinguishers available the job site.
 - (5) Provide adequate ventilation.
- c. After completion of application, do not allow traffic above or adjacent the coated surfaces until the coating material has cured and the protection course is in place.
- d. Remove debris daily from the waterproofing area and haul off site.
- e. Immediately repair or replace all damaged and/or defective work to the approval of the Architect, Waterproofing Consultant and Contractor. The repair of damaged or defective work shall be performed at no additional cost to the Owner or Contractor, unless the Subcontractor's protected work in place is damaged by others beyond his reasonable control.

1.8 REGULATORY REQUIREMENTS

- A. Conform to regulations of public agencies, including any specific requirements of the city and state of jurisdiction, including the following:
 - 1. American Society for Testing and Materials (ASTM).
 - 2. Canadian Government Specification Board (CGSB) 37-TP-50M, Standard for "Asphalt, Rubberized, Hot Applied, for Roofing and Waterproofing".
 - 3. Underwriters Laboratories (U.L.) Class "A".
 - 4. The Tile Institute of America.
 - 5. Conform to regulations of public agencies, including any specific requirements of the city and state of jurisdiction.

1.9 GUARANTEES

A. Subcontractor Guarantee:

The Waterproofing Subcontractor shall guarantee the installation of waterproofing system and flashing to be watertight for a period of 5 years from the date of substantial completion of the waterproofing project. The Subcontractor shall make all repairs during this guarantee period to maintain the waterproofing watertight and in conformance with these specifications without additional cost to the Owner or Contractor. Without invalidating or voiding any portion of the guarantee, the Owner and/or Contractor has the right, in the case of emergency at any time during this guarantee period and without invalidating this guarantee, to make any temporary repairs that are required in order to protect the building and the contents of the building from damage due to leakage through the installed waterproofing system.

B. Manufacturer Guarantee:

1. In addition to the Subcontractor's Guarantee, the Manufacturer shall furnish a 5 + 5 Year Joint Guarantee covering any and all repairs required to keep the waterproofing, including the field and flashings, watertight for 5 years. After the 5-Year Guarantee, the manufacturer shall inspect the project to determine repairs needed to extend the guarantee an additional 5 years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS AND SYSTEMS

- A. This specification has been compiled on product performance criteria and not on system criteria. Evaluation of submittals shall be solely based on a product comparison to the specified materials.
- B. All components must be obtained as a single source from the membrane manufacturer to ensure total system compatibility and integrity. The following are acceptable manufacturers and systems for this project:
 - 1. Tremco Global Sealants, 3735 Green Road, Beachwood OH. Local Representative: Mr. Alan Cantarini. Phone 949-246-0733. E-mail: ACantarini@cox.net Website: www.tremcosealants.com
 - 2. Or approved equal.

2.2 FLUID APPLIED ELASTOMERIC DECK COATING MATERIALS FOR INTERIOR RAMP

- A. Base Coat: Tremco manufactured Vulkem 350 NF.
- B. Top Coat: Tremco manufactured Vulkem 950 NF.

2.3 FLUID APPLIED ELASTOMERIC COATING WATERPROOFING MATERIALS

- A. Base Coat: Tremco manufactured Vulkem 360 NF.
- B. Top Coat: Tremco manufactured Vulkem 951 NF.
- C. Base and Top Coats:

PERFORMANCE REQUIREMENTS OF CURED FILM

Property	Typical Value	ASTM Method
Composition	Polyurethane, aggregate, and	
	epoxy primer	
Weight Solids	80%	D-1353
Hardness, Shore A	78 to 87	D-2240
Tensile Strength	2500 PSI	D-412
Ultimate Elongation	450%	D-412
Tear Resistance	250 per lin. in.	D-1004
Adhesion to Concrete	30 lbs/in.	D-903
Low Temp. Flexibility	-40F to +180F HEAT/COLD	

- D. Primer: Tremco manufactured Vulkem Primer #171 or TremPrime Multi-Surface Urethane Primer.
- E. Aggregate: 20 to 40 mesh with minimum hardness of 6.5+ (Mohs).

F. Sealants:

- 1. Semi-Self Leveling Sealant (for plywood joints): Conforming to ASTM C 920, Type S, Grade P, Class 50, Use T, M, A, O and I (Class 2), such as Tremco manufactured Vulkem 45 SSL.
- 2. Non-sag Sealant (for sealant locations specified except for plywood joints): Single component, non-sag, low modulus, moisture-curing polyurethane sealant, conforming with Federal Specification TT-S-00230C, Type II, Class A, such as Tremco, Vulkem 921 or Sikaflex-15LM and as approved by the primary material manufacturer.
- G. Reinforcing Fabric: Spunbonded polyester fabric reinforcing sheet (Tremco Reemay Reinforcing Fabric 2014).

2.4 MISCELLANEOUS

A. Fasteners:

1. Sheet Metal to Wood/Plywood: Corrosion resistant ring shank nails with 3/8-inch diameter heads, length to penetrate minimum ³/₄-inch into or through the plywood.

B. Sheet Metal:

- 1. Galvanized Iron: Shall be 24-gauge or as otherwise specified or shown on the drawings, meeting ASTM A 526, G-90 coating designation.
- 2. Soldering flux shall conform to Federal Specification O-F-506C, Type I Form A or B.
- 3. Solder shall conform to ASTM B 32-70 alloy grade 58: 50% tin, 50% lead.
- C. Cleaner Material: Only as allowed by manufacturer.
- D. Bond Breaker Tape: As approved by Waterproofing Material Manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. The Contractor shall examine all surfaces to receive the waterproofing assembly to verify it is acceptable and proper for the application of the membrane. Should deficiencies exist, the Contractor and Architect shall be notified in writing and corrections made prior to commencing with work.
- B. The Contractor shall not proceed with the installation of the membrane assembly until all defects have been corrected.
- C. The Contractor shall verify that all surfaces that will be covered with the waterproofing membrane shall be clean, dry, and free of loose paint, rust or other contaminants.

3.2 PREPARATION

- A. All surfaces to receive waterproofing shall be cleaned prior to coating application. Surfaces contaminated with oil, grease or other contaminants shall be cleaned in an appropriate manner to remove all contamination and ensure a positive bond. All surfaces must be dry, smooth, free of depressions, voids, protrusions, clean and free of surface contaminants.
- B. Plywood Deck Joints: Plywood deck joints shall be detailed with semi self leveling urethane sealant. A 4-inch wide strip of reinforcing fabric shall be immediately embedded into a 30 dry mils application of urethane sealant that extends a minimum 3 inches each side of joint. Edges of sealant shall be feathered to a smooth edge. Installed fabric shall be covered with a 10 mils thick application of base coat after sealant has cured.
- C. Plywood shall be protected from damage as soon as possible after installation. In the case that the balance of the waterproofing system will not be installed immediately after plywood deck installation, a construction or protection coat of minimum 10 mils shall be applied over the reinforcing fabric plywood deck joint preparation and the sheet metal flashings and their reinforcing fabric flashing. When balance of waterproofing system occurs, this construction coat shall not be a part of the required thickness specified for installation and coat surface shall be properly cleaned and solvent wiped to receive the remainder of the waterproofing system installation.
- D. Any priming required by the material manufacturer shall be accomplished. Verify priming required using field adhesion tests.
- E. Install a minimum 1-inch, trowel grade sealant cant or urethane sealant cant at all corner locations, horizontal or vertical, and all transitions between penetrations and walls. Prime all areas to receive trowel grade sealant with specified primer.
- F. Clean metal surfaces to bright metal by wire brushing or mechanical etching. Roughen lead and plastic surfaces at the seal areas with sandpaper prior to cant installation.
- G. Mask any areas not to receive coating using masking tape.

3.3 FLASHINGS

- A. Sheet Metal Flashings:
 - 1. Install sheet flashings where indicated on the drawings prior to the application of water-proofing membrane. Set sheet metal flashings into a bed of urethane sealant and fasten flashing flanges 6 inches on center staggered near the edge of flashing flange, in locations that allow coverage by reinforcing fabric (approximately 1-1/4, 3/4 inch in from leading edge of the flashing).

- 2. Prime sheet metal with manufacturer recommended primer and allow primer to dry in accordance with manufacturer requirements.
- 3. Preparation trowel grade sealant cant application shall be installed after sheet metal flashing preparation to allow sheet metal flashings to properly fit against existing surfaces.

B. Fabric Flashings:

- 1. Install minimum 20 dry mils of fluid applied waterproofing base coat to cover the properly primed sheet metal flashings, including vertical legs and extending a minimum 4 inches onto the deck surface. Immediately embed reinforcing fabric into the coating while the coating is still wet. Reinforcing fabric shall be installed along the edge of sheet metal flashing flanges such that the edges of the flashing and the flashing fasteners are completely covered and reinforced. Reinforcing fabric shall also be installed to cover joints in the sheet metal flashings.
- 2. After first flashing coat has cured, cover over the sheet metal flashings and reinforcing fabric, using fluid applied waterproofing. Edge of fluid applied waterproofing application onto the deck surface shall be feathered.
- 3. Drains: Drains shall have flanges to receive waterproofing system. Factory paint on drain flanges to receive waterproofing shall be removed immediately prior to flashing installation to prevent the formation of rust. Sealant shall be installed to fill gaps between substrate and drain assembly. Metal shall be properly primed and the primer allowed to dry. Fabric flashing shall be installed into a minimum 20 dry mils of base coat to extend over drain flanges and onto deck a minimum of 6 inches.
- C. Any voids, where flashings are not completely embedded, must be cut out and affected flashing materials replaced.
- D. Other detailing, reinforcement and flashings shall be done in accordance with the manufacturer's standard guideline details and the project drawings.

3.4 MEMBRANE INSTALLATION

- A. The waterproofing membrane shall be installed in strict accordance with the manufacturer's specifications.
- B. The waterproofing applicator shall have sole right of access to the specified areas for the time needed to complete the application and affect an adequate cure.
- C. Primer: Apply specified primer at a minimum rate of 1/3 gallon per 100 square feet to all concrete surfaces. Within 8 hours of application of primer, base coat must be applied. If base coat cannot be applied within 8 hours, reprime. Verify primer use with field tests prior to work.
- D. Base Coats: Apply the seamless elastomeric base coat in a minimum of two coats, with each coat installed at the rate of 1-1/4 gallons per 100 square feet, to yield an average of 15 dry mils for each coat. Base coat total thickness shall be a minimum of 30 dry mils. Coating application shall be in strict accordance with application procedures outlined by manufacturer. Each base coat layer will be allowed to cure prior to use of additional coatings.

E. Top Coat:

1. Apply the top coat of the fluid applied elastomeric membrane at the rate of 1 gallon per 100 square feet for the first layer, in order to obtain a minimum thickness of 12 dry mils.

- Immediately broadcast properly graded, evenly distributed, aggregate at a nominal rate of 12.5 pounds per 100 square feet (to refusal).
- 2. The first top coat layer will be allowed to cure. When dry, remove excess aggregate and recoat the surface with a second top coat application at the rate of 1 gallon (minimum) per 100 square feet, or as needed to obtain a minimum thickness of 12 dry mils.
- F. Minimum thickness of the waterproofing deck coating system shall be 54 dry mils less aggregate.

3.5 WATER TEST

- A. Contractor shall perform a water test after membrane has sufficiently cured. The performance of a successful water test must occur prior to covering membrane with protection material and sidewalk pour.
- B. Results of water test shall be documented and forwarded to the Architect. Repairs shall occur in the case of an unsuccessful water test. The repairs required by waterproofing material manufacturer which may be necessary after water test shall be performed at no additional cost to Owner. After repairs are completed, repeat water test until a successful water test occurs.

3.6 PROTECTION

- A. The completed waterproofing membrane shall not be subject to any pedestrian traffic during the first 24 hours after application is complete.
- B. After completion, waterproofing membrane shall be adequately protected by the Contractor against damage, stain or misuse until final inspection.

3.7 CLEAN-UP

- A. Contractor shall remove all markings from finished surfaces. In areas where finished surfaces are soiled by membrane or any other source caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to instructions.
- B. Contractor is to keep the premises clean and free from accumulations of waste materials and rubbish at all times. He shall remove all debris, scrap, and rubbish from the site daily.
- C. Surplus materials and all equipment shall be promptly removed from the site upon completion of the work.
- D. Masking shall be removed for disposal.

3.8 INSPECTION

A. A Waterproofing and Quality Control Consultant (hereinafter also referred to as Consultant and/or Independent Roofing Consultants) shall be retained by the Owner to provide quality control services. Duties and functions of the Quality Controller shall include inspection of the waterproofing system installation.

B. As the Waterproofing Contractor's work progresses, at intervals approved by the Waterproofing Consultant and Owner's Representative, Manufacturer's Representative shall make progress inspection(s) of the completed-to-date waterproofing system, etc. Deficiencies or incomplete work items will be noted at this time and documented. A punchlist of all such items will be issued to the Waterproofing Contractor for immediate correction. The membrane thickness must be identified by the manufacturer during their inspections.

END OF SECTION

WATERPROOFING CONTRACTOR CERTIFICATION

Project Name:	
Building No./Address:	
Date of Installation:	
Waterproofing Manufacturer:	
WATERPROOFING CERTIFICATIO	:
	s project, I certify that the specified waterproofing system(s) have been's published criteria, project specifications, and drawings.
Name of Subcontractor's Company:	
Name of Principal in Subcontractor's Com	any:
Signature of Principal:	Date

SECTION 075140 – BUILT-UP BITUMINOUS ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Scope

- 1. The extent of the built-up roofing system replacement work is indicated on the project drawings and by provisions of this section and the supporting detail drawings, and is defined to include roofing, composition flashing, stripping and roofing accessories integrally related to roofing installation.
- 2. Contractor shall coordinate with all other trades that directly influence the roof system application, to provide a watertight installation of roof flashings.
- Contractor shall verify condition of substrate, deck slope, curbs, penetrations, flashings, equipment supports, etc., and shall notify the Consultant, Architect and General Contractor of any discrepancies in the Scope of the Work as shown on the drawings prior to submission of bid.
- 4. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement and exposure to weather without failure.

B. Existing roofing conditions include:

1. <u>Approximate Roof Size</u>: Contractor must verify dimensions.

2. <u>Existing Roof Systems:</u>

- a. The existing roof system was found to consist of a fiberglass cap sheet and two (2) plies of fiberglass felts, each installed into a layer of asphalt over a fiberglass base sheet. The base sheet had been mechanically attached to the wood plank roof deck over a rosin sheet.
- b. On the ledge area around the building perimeter, and in the light well roof areas, a modified bitumen membrane cap sheet was found installed over a fiberglass base sheet over the wood plank roof substrate.

C. The specified roof replacement work shall include:

- The existing roofing materials, inclusive of roof membrane, flashings and sheet metal accessories shall be removed and disposed of down to the wood plank substrate in accordance with applicable laws and codes.
- The inspection of the existing wood plank substrate and the replacement of any deteriorated or otherwise damaged areas with new to match existing, on a unit cost basis, including deck supports.
- 3. The installation of new plywood substrate shall occur over the wood plank deck.
- 4. The new roof system shall consist of a built-up roof assembly consisting of a "cool roof" type mineral surfaced fiberglass cap sheet over three (3) plies of Type IV fiberglass felts,

each set into independent applications of hot asphalt Type III over a fiberglass base sheet. The base sheet shall be mechanically fastened into the new plywood deck over a rosin sheet.

- 5. The new roof system is to be classified by the Underwriters Laboratory, Inc. (U.L.) as a Class A assembly.
- 6. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
 - a. Fire/Windstorm Classification: Class 1A-90.
 - b. Hail Resistance: MH.
- D. Special Base Bid Scope of Work Items:
 - All work shall be coordinated with the General Contractor to allow work by other trades on the roof.
 - Contractor shall coordinate with the General Contractor to remove and dispose of any and all obsolete equipment, pipes and electrical conduit.
 - 3. The Contractor must coordinate all work with the Owner, including unit shut downs, to minimize disruption to the normal building operations.
 - 4. During the roofing installation, units must be shut down and intakes masked to prevent fumes from entering the building.
 - 5. Disconnection, manipulation and reconnection of existing electrical, mechanical, plumbing, duct work, etc., associated with proper roof installation.
 - 6. The Roofing Contractor shall verify that roofing substrate conditions are suitable for the proper application of the specified roofing prior to starting work. Substrate verification items shall include, but are not limited to, the following:
 - a. Specified minimum height of all platforms, curbs and other flashings above the roof's surface, a minimum 8 inches, unless otherwise specified, shall be verified. Heights shall take into account the elevation of the specified pre-tapered insulation crickets and addition of plywood over the wood plank deck. Penetrations must be extended to 8 inches where not sufficient.
 - b. Verify installations of drains have occurred and that drains are acceptable for roofing application.
 - c. Minimum penetration spacing shall be verified. Penetrations shall be spaced a minimum of 18 inches, face-to-face, from each other, curbs, walls, etc.
 - d. The location of penetrations out of waterways, a minimum of 18 inches, shall be verified.
 - e. Minimum pipe penetration heights shall be verified. Pipes must extend a minimum of 8 inches above the new roof. Verify insulation thicknesses with this dimension. (Note: If codes for other work requires additional height, the more

stringent requirements shall prevail, such as if plumbing codes require 12 inch high pipes.) For conduit penetrations, hard conduit must be provided for the first 12 inches out of the roof deck to allow proper roof flashing installation.

- f. Verify that all penetrations are through the roof prior to roofing application.
- g. All base flashing and wall covering backing must be continuous and ready to receive roofing application.
- h. The Roofing Contractor shall verify that ponding conditions do not exist on the roof substrate prior to the installation of roofing. If ponding areas exist, they shall be brought to the attention of the Architect for immediate resolution.
- 7. The Contractor must take all necessary protections to prevent asphalt drippage inside the buildings from occurring. These protections must include, but are not limited to, the installation of roof cement seals around roof penetrations immediately prior to using hot asphalt.
- 8. Roof related sheet metal work shall include the fabrication and installation of the following items:
 - Drive joint seam sheet metal coping assemblies with soldered transition, corner and termination pieces.
 - b. Two-piece counterflashing assemblies with factory or soldered corner and transition pieces.
 - c. Threshold pan flashings to counterflash roofing and tie-in with wall conditions.
 - d. A sheet metal expansion joint cover with end transitions to cover over wall expansion joints.
 - e. Sheet metal pan flashings at platform type supports, including soldered seams, soldered transitions and transition flashings at penetrations of platforms.
 - f. Edge metal flashings with special soldered transition pieces.
 - g. Sheet metal scupper flashings with soldered seams. Double sided scuppers to receive field soldered flanges on one side of the wall.
 - h. At the multiple pipe penetrations, sheet metal hood type flashings and the slotted sheet metal hood cover plates.
 - i. Lead flashings at pipe penetrations and drains.
 - j. Galvanized heat vent pipe flashings, storm collars and T-top vent flashings with end caps.
 - k. Sheet metal counterflashing inserts, where specified.
- 9. Roofing work to include or coordinate with wall work and wall repairs, as follows:
 - a. Stucco wall tie-in at new counterflashing installations. Stucco wall tie-in to include angled transitions to coping elevations to eliminate vertical steps of roofing located between counterflashing and coping ends.

- b. Saw cut into existing brick chimney wall to install counterflashing.
- c. Stucco wall tie-in at sheet metal coping transitions to stucco walls.
- d. Edge-to-wall transition flashings shall include tie-in to stucco walls.
- e. Exterior walls shall be filled in flush around scupper flashings to eliminate large openings on the exterior side of the walls.
- f. Appropriate stucco wall repairs shall include tie-in of the various flashings in a shingle fashion with building paper.
- 10. As coordinated with the above work, the Roofing Contractor shall install all roof related flashings, including the following:
 - a. At the drain areas, a four pound lead flashing reinforcement sheet is to be installed over the installed application of the interplies in a bed of roof cement, primed and stripped-in with two (2) additional plies, prior to surfacing installation.
 - b. Four pound lead flashings shall be installed at all pipe penetrations. The Roofing Contractor shall be responsible for completing the watertight seal at the top edge of the pipe flashings. Flashings are to be sealed with either independent counterflashing cap at open-ended penetrations or stainless steel cinch bands and urethane sealant application.
 - c. All split flashings are to be fully soldered with galvanized flashings being secured with rivets at 1 inch on center prior to solder applications. Split lead flashings shall be minimum four pound lead.
 - d. No pitch pan flashings will be allowed on this project.
 - e. At heater and cylindrical vent penetrations, the installation of new 24-gauge galvanized sheet metal flashing bases with independent storm collars. Storm collars are to be sealed with heat resistant caulking applications.
 - f. At T-top vents, the fabrication and installation of new 24-gauge galvanized flashings with end caps to restrict wind driven rain. Vent opening is to be covered with wire mesh to restrict bird and rodent entry (i.e. "bug screens").
 - g. The installation of new edge metal flashings shall occur where specified. The new edge metal flashings shall have minimum 4 inches overlap at laps, minimum 4 inches wide flanges and field verified face dimensions that cover at or past existing edge metal face locations onto the existing wall materials. Face dimensions shall take into account additional substrate thickness, such as caused by specified plywood.
 - h. The fabrication and installation of new 24-gauge galvanized sheet metal flashings at all scupper locations. New flashings are to be fabricated with minimum 4-inch flanges (canted for encapsulation of cant strip), with scupper flashings extending a minimum 2 inches beyond the exterior face of the parapet wall. Perimeter of the scupper flashings at exterior walls shall be sealed with a new ure-thane sealant joint.
 - i. The ledge roof drainage openings shall be enlarged to receive double-sided scupper flashings. The double-sided scupper flashings shall be fabricated simi-

lar to the scupper flashings described above, however, instead of extending past wall, additional 4-inch flanges shall be field soldered onto the flashing to tie-in with the roofing wall covering on the inside parapet walls.

- j. For multiple penetrations through the same location, new curbs and new hooded, curb mounted, flashings shall be fabricated and installed. The hooded flashings shall include a slotted cover plate, sealed where the pipes enter the hood. The hood shall be installed in a manner, such that any pipe penetrations entering the hood slope away from the hood.
- 11. All curb locations shall receive a base flashing installation. Work to include fabrication and installation of new 24-gauge galvanized sheet metal counterflashing or counterflashing insert at curb locations.
- 12. All units shall be supported with new platforms. Platforms shall extend a minimum 8 inches above the surface of the new roof. Platform work shall include the fabrication and installation of a new 22-gauge galvanized iron sheet metal pan cover with all seams soldered and the installation of the new pan cover over a new roofing or waterproofing underlayment.
- 13. Install pre-tapered roof insulation crickets where necessary, such as behind curbs and penetrations that block water flow, to result in complete and proper roof drainage. The tapered roof insulation crickets shall be installed into hot asphalt over the installed base sheet prior to the installation of the roofing plies.
- 14. New seismic securement of the mechanical units shall be completed using suitable straps, fastened through the vertical face of the new platform pan flashings. The strap securement shall be sealed using rubber gaskets and urethane sealant.
- 15. Attachment into or through the horizontal surfaces of the sheet metal pan flashings shall receive a pressure seal. Pressure seals over sheet metal pan flashings shall consist of a smooth sided rubber pad, approximately ¼-inch thick, installed between the bolted support and the pan flashing. Bolt holes shall be pre-drilled and filled with urethane sealant before bolts are installed. Urethane sealant shall be installed over and under the rubber pad prior to bolt installation and around and over pad edges and bolt heads after bolt installation.
- 16. Downspouts and drain lines must be cleared of debris and clogs prior to the work and at the completion of the work.
- 17. The existing sheet metal pan type drains shall be replaced with new drain sumps and cast iron clamping ring type drain assemblies. This work shall include proper tie-in to the existing drain lines.
- 18. The inspection of internal drain assemblies with the replacement of any missing or obsolete drain assembly parts, including clamping ring, drain bolts and domes using new cast iron components. Work to include tapping out broken drain body bolts to permit the installation of new bolts. Plastic drain assembly domes are to be replaced with new cast iron domes.

Prior to reinstallation, domes and clamping rings are to be repainted (color – yellow).

During the roof installation process, a four lb. lead flashing reinforcement sheet shall be installed over the built-up roofing interply installation in a bed of roof cement, primed and stripped-in with an additional two (2) plies.

This work shall include the installation of a new urethane sealant joint, at exterior wall locations penetrated by drain lines.

- 19. The installation of an additional reinforcing ply in all drainage areas shall be included in the roofing work.
- 20. Two (2) additional plies shall be installed in all minor ponding locations.
- 21. At the base flashing terminations, proper fastening of the roofing materials shall occur to be counterflashed by sheet metal or roofing wall coverings. For parapet walls, the base flashing and wall covering, as occurs, shall be terminated and properly fastened. The fasteners and top edge of the roofing materials shall be covered at these areas using the new sheet metal coping assembly.
- 22. At roof transitions, the fabrication and installation of new 24-gauge galvanized sheet metal flashings. Transition flashings to be fabricated with appropriate flanges to provide coverage of roofing edges, where no coverage would otherwise exist. Transition flashings must be properly secured with appropriate fasteners. At complex transition flashings, fully soldered joints are required.
- 23. The installation of a three-course application at the top edge of base flashings under sheet metal counterflashing and all inside and outside corners of base flashings and wall coverings shall be included in the work.
- 24. The primary material manufacturer's walkpads shall be installed at each access location to the roof. Walkpads shall also be installed in front of all unit access panels. Walkpads shall be installed to protect the cant strip area at installation locations.
- 25. All lightweight horizontal plumbing lines and conduit lines are to be supported with new redwood blocks placed over roof protection material and spaced at a maximum 4 to 6 feet on center, or as becomes necessary to completely support lines off of the roof surface. Alternatives to the redwood blocks would include new closed cell foam support blocks, pre-manufactured with uni-strut attachment embedded.
- 26. All exposed roof cement and asphalt shall be allowed to cure (for roof cement a minimum of 30 days cure shall be allowed) and a surfacing coating applied that conforms to California Building Code "cool roof" requirements.
- 27. The work shall include painting of all exposed metal flashings, pipes and ducts to match the existing building color scheme. The Owner must approve the color of all finishes, including roofing materials and painted items, prior to finish installation.
- 28. All color and finish samples must be submitted to the Architect for approval prior to installation. If Architectural approval is not obtained prior to the work, any aesthetic items, which are not satisfactory to the Architect after completion of work, will be the responsibility of the Roofing Contractor to repair or replace.
- E. Site and Special Applicator Conditions:
 - 1. Roofing System Criteria: The Applicator shall provide in the cost of his bid all details as required by these specifications, NRCA, SMACNA, ARMA and the primary material manufacturer for the specified guarantee.
 - Typical and custom details not shown herein and that may be required by the primary material manufacturer, Consultant shall be covered by the base bid. Custom details and

shop drawings shall be approved in writing by the primary material manufacturer, Architect and Consultant.

- 2. Responsibility for Damage: The Owner, Architect, General Contractor and Consultant connected with the Work shall not be answerable or accountable in any manner: for any loss or damage that may happen to the Work or a part thereof; for any loss or damage to any of the materials or other things used or employed in the performing of the Work; for injury to or death of any person either workman or the public; or for the damage to property from any cause which might have been prevented by the Applicator, or his workman or other workmen, or anyone employed by him or any subcontractor.
- Field Measurements and Material Quantities: Applicator shall have sole responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.
- 4. Applicator must notify Owner, Architect, General Contractor and Consultant of any omissions, contradictions or conflicts 7 days before bid date. Owner, Architect, General Contractor and Consultant will provide necessary corrections or additions to the plans and specifications by addendum. If Applicator does not so notify Owner, Architect, General Contractor and Consultant of any such condition, it will be assumed that the Applicator has included the necessary items in the bid to complete this specification.
- 5. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- Independent Roofing Consultants and Heritage Architecture and Planning shall be listed under additionally insured by the awarded roofing contractor on their liability insurance certificate.
- 7. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- 8. Arrange work sequence to avoid use of newly-constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas.

G. Unit Cost Items:

- 1. Provide a separate cost, per lineal foot, for the replacement of any deteriorated or otherwise damaged wood plank substrate to match existing.
- 2. Provide a separate cost, per member, for the replacement of any damaged or otherwise deteriorated subpurlins with new 2-inch x 6-inch Douglas Fir #1 grade subpurlins. Quoted cost to include installation of new two (2) Simpson hangers.
- 3. Provide a separate cost, per square foot, to install tapered roof insulation crickets (this cost is separate from the base bid crickets required).
- 4. Provide a separate cost, per roof drain, for installation of new, sumped roof drains. Remove and re-install decking as necessary to accomplish proper installation of the roof drain assembly (this cost is separate from the drains required in the Base Bid).

- 5. Provide a separate cost, per lineal foot, for installation of new roof drain lines to tie into existing drain lines. Size of new drain lines shall match that of existing (this cost is separate from the drain lines required in the base bid).
- 6. Provide a separate cost, per lineal foot, to install walkpad paths, if selected to protect various roof locations.

1.2 QUALITY ASSURANCE

- A. The Contractor shall provide primary products, including each type of roofing membrane produced by a single manufacturer which has been producing these types of products successfully for not less than 5 years, and shall provide only secondary products which are acceptable to manufacturer of primary products.
- B. Contractor shall have a minimum of 5 years experience in successfully applying the same or similar materials and shall be approved by the material manufacturer.
- C. Contractor shall complete all work in accordance with the requirements of the current California Building Code as adopted or amended by the local building department, the material manufacturer's published general installation requirements, and industry standards. Industry standards for roofing are to be established by the National Roofing Contractors Association's Fifth Edition Manual, with standards for sheet metal components established by the latest manual from the Sheet Metal and Air Conditioning Contractors National Association. In the event of a conflict with these specifications and drawings with the above, the more stringent requirement shall prevail.

1.3 APPLICATOR REQUIREMENTS

- A. Contractor shall be currently approved and licensed by the manufacturer of the roofing materials to be used. Contractor shall use only skilled roofers completely familiar with the products and the manufacturer's current recommended methods of installation.
- B. Except as modified and supplemented herein; Contractor shall follow the published requirements and written recommendations of the manufacturer of the roof system and other material manufacturers. Concerning methods of installation, industry practices apply only when this specification does not address the matter.
- C. If, in the opinion of the Contractor, any work is indicated on drawings or specified in such a manner as to make it impossible to produce work of the highest quality, or should discrepancies appear from one drawing to another or between drawings and specifications, the Contractor shall advise the Architect and Consultant before proceeding.

1.4 PRE-ROOFING CONFERENCE

- A. Prior to installation of the roofing system, representatives of the following entities are requested to meet at the project site: Owner's Representative, Roofing Consultant (i.e. Independent Roofing Consultants), General Contractor, Architect, Roofing Contractor, and representatives of other entities directly concerned with installation or performance of the roofing system, including, but not limited to, plumber, electrician, mechanical, etc.
- B. Attendees shall review all pertinent details and specifications, noting any potential problems and making any changes, deletions or additions as deemed necessary. Also included in the discussion will be the following: nature and

availability of roofing materials; guarantee and submittal requirements; scheduling and forecast weather conditions; regulatory requirements; protection of building, building components and completed roof system; proposed installation procedures; and any additional items related to the total roof system.

- C. Where possible, attendees shall tour roofing areas and discuss general conditions, including roof slope, curb and penetration flashing details, drainage, and material compatibility.
- D. Discussion will be recorded by the General Contractor (or designated representative), including agreement or disagreement on matters of significance. If meeting ends with substantial disagreements, it will be determined how disagreements will be resolved and a date will be set for a reconvened meeting. A copy of the recorded discussion will be furnished to all attendees.

1.5 SUBMITTALS

- A. Not later than 10 days after contract is issued (approval must occur prior to the Pre-Job Conference and must be approved by Architect prior to Notice to Proceed being issued):
 - 1. Membrane Manufacturer Submittals:
 - Testing: Manufacturer verification that their materials meet the physical performance characteristics and the ASTM requirements indicated in this specification.
 - b. Manufacturer product information and installation guideline specifications for all products to be used on project.
 - c. Membrane material manufacturer must provide the names, locations, and contact persons of the installations of its material over 10 years old which are still performing in the Southern California area.
 - Contractor shall submit material Manufacturer's Product Data Sheets for each product to be utilized in the installation of the specified roofing assembly, including rolled goods, fasteners,
 - primer and mastics. He shall include data substantiating that materials comply with specified requirements, including bitumen criteria for softening point, flash point, equiviscous temperature (EVT), and finished blowing temperature. This certification is to be obtained prior to commencement of application.
 - e. Manufacturer approval that roof system(s) meets FM loss prevention data for wind uplift requirements. Where necessary, submit fastener pattern or methods required meeting the specification requirements and manufacturer's requirements.
 - 2. Submit Manufacturer's Product Data Sheet and Material Safety Data Sheet (MSDS) information on all products to be used on the project. Where contents of submitted literature from manufacturers include data not pertinent to the submittal, clearly indicate which portion of the contents is being submitted for review.
 - 3. A detailed work plan indicating number of work days; for each work day the crew size and activities to be accomplished; intended disposal location; specific start and stop work times on site and such other information appropriate for the Consultant to determine that the Applicator has adequately planned the work.

- 4. Before any membrane roofing materials are delivered to the job site, Applicator shall submit a letter from the manufacturer that they are an approved certified applicator to install the specified system. Also, a letter from the manufacturer for intent to guarantee roof system at this project shall be submitted.
- 5. Roofing material manufacturer shall provide a letter of deck acceptance along with detail compliance for issuance of guarantee.
- 6. Applicator shall submit shop drawings verifying the construction of all sheet metal accessories and components, including, but not limited to, coping, edge metal, counterflashings, scuppers and supports.
- 7. Shop drawings for tapered insulation layouts shall be required in advance of roof deck completion. This shop drawing shall be used to verify penetration elevations necessary for proper roof flashing elevations above the new roof.
- 8. Aesthetic submittals for all finishes must be submitted for approval by the Architect prior to work.

1.6 PRODUCT HANDLING

- A. Deliver all roof system materials in original manufacturer labeled packages with bitumen bills of lading to show manufacturer, bitumen softening point, EVT, finished blowing temperature and flash point with each delivery. All roofing products shall bear Underwriters Laboratories (U.L.) labels.
- B. When stored outdoors, store rolled materials on end and on pallets. Totally cover materials stored outside using a breathable watertight covering. Extend covering down to the pallet so that no materials remain exposed and properly secure to resist wind uplift. Visqueen or other non-breathable plastic coverings will be used at the Contractor's risk. Unprotected, moist, or otherwise damaged materials, or materials with evidence of moisture damage, such as staining, will be conspicuously marked for permanent removal from the job. Handle rolled goods with care to prevent damage to edges or ends.
- C. Storage of materials should not block any entryways.
- D. Select and handle material handling equipment to avoid damage to materials or applied roofing.
- E. Use only kettles and/or tankers that have automatic thermostats to control the bitumen temperature. They must also have accurate thermometers that are clean and easy to read.
- F. Inspect all materials for conformance to specification. Materials found that are not approved or do not meet required standards will be marked as rejected and permanently removed from the job site.
- G. Do not allow bitumen to be heated above the finished blowing temperature. In the event that asphalt is heated above the finished blowing temperature, discontinue application until asphalt is allowed to cool to an acceptable temperature. Asphalt that is heated above the finished blowing temperature beyond four hours shall be discarded and not used for the built-up roof system.
- H. Do not load or permit any part of a structure to be loaded with a weight that will endanger its safety or cause damage.

I. Verify that all materials are protected before, during and after arrival at the job site. Verify that all materials have been adequately protected from moisture damage while in transit.

1.7 JOB CONDITIONS

A. Environmental Requirements:

- 1. If inclement weather is anticipated during the work period, Contractor shall take adequate precautions to insure that materials, applied roofing, and building interior are protected from possible moisture damage or contamination.
- 2. Wind velocity limitation will be based on ability to apply materials in specified manner.
- 3. Special precautions are required when ambient temperature is below 40 degrees Fahrenheit.

B. Protection:

- Protect building contents and grounds during the process of the work. Protect all paving, walls of building, and buildings adjacent to hoist, kettle and stinger pipe prior to starting work. Windows, doorways, docks, walkways, etc., may require special protection measures.
- 2. Remove all debris daily from the roof and haul off site.
- 3. Provide 15 pound minimum size fire extinguishers using ammonium phosphate fire fighting agent. Locate two (2) at each kettle or tanker and two (2) at site of hot bitumen application on the roof.
- 4. Provide special protection to avoid heavy traffic on completed work when ambient temperature exceeds 80 degrees Fahrenheit.
- 5. Contractor must take every precaution to prevent interior leakage, materials from falling into the interior, or other such occurrences. Installation of materials shall be accomplished in such a manner that bitumen drippage does not occur.
- 6. In the event of damage, immediately repair or replace all damaged and/or defective work to the approval of the Owner.

1.8 REGULATORY REQUIREMENTS

- A. Conform to regulations of public agencies, including any specific requirements of the city and state of jurisdiction.
- B. The roof system is to be classified by Underwriters Laboratories, Inc. (U.L.) Class A materials.

1.9 GUARANTEE

A. Contractor Guarantee

1. The Contractor shall guarantee the installation of roofing and flashing to be watertight for a period of 5 years from the date of substantial completion of the roof installation project. The Contractor shall make all repairs during this period to maintain the roof watertight and in conformance with these specifications without additional cost to Owner.

At the end of the guarantee period, the Contractor shall, at Owner's option, with the Consultant and a representative of Owner, conduct a final roof inspection. All blisters, bubbles, bare spots, and other defects shall be repaired by the Contractor at his own expense. Owner has the right, in the case of emergency at any time during this period and without invalidating this guarantee, to make any temporary repairs that are required in order to protect the building and the contents of the building from damage due to the roof leaking.

B. Manufacturer Guarantee:

1. Before work is accepted and final payment can be made, furnish to Owner, a written No Dollar Limit (NDL) Guarantee, transferable to any owner of the building, covering any and all repairs required to keep the roof, including the field and flashings, watertight for a period of 10 years, respectively, beginning at the time of the project's final acceptance.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. All membrane roofing materials shall be manufactured by the following approved manufacturers:
 - 1. GAF Materials Corp.
 - 2. Johns Manville.
 - 3. Malarkey Roofing Products

2.2 SHEET MATERIALS

- A. Sheathing Paper: Rosin Sheet, not less than 4 lbs. per 100 square feet.
- B. Asphalt Coated Fiberglass Base Sheet: Fiberglass (mat)s coated with premium asphalt, meeting ASTM D 4601, Type I Gafglas #75 Base Sheet by GAF, GlasBase by Johns Manville or #515 by Malarkey.
- C. Glass Fiber Felt: Fiberglass mat coated with premium asphalt, meeting ASTM D 2178, Type IV Gafglas Ply 4 by GAF, GlasPly IV by Johns Manville, or #500 by Malarkey. (Also to be used as reinforcing plies in base flashings.)
- D. Woven Glass Fabric ASTM D 1668, Type I.
- E. Cool Roof Cap Sheet: Asphalt coated fiberglass mat with fine minerals and a factory applied cool roof coating surfacing the cap sheet, meeting ASTM D 3909, ASTM E903, ASTM E408 and compliant with California Energy Code, California Code of Regulations, Title 24, Part 6 Gafglas EnergyCap by GAF, GlasKap CR by Johns Manville or #524 RCap Reflective Fiberglass Cap Sheet by Malarkey. (Also to be used as surfacing ply in base flashings and wall coverings.)
- F. Mineral Surfaced Fiberglass Cap Sheet (for Alternate #1 and to cover metal straps over plywood in base bid): Asphalt coated fiberglass mat with mineral surfaced cap sheet, meeting ASTM D 3909 Gafglas Mineral Surfaced Cap Sheet by GAF, Glaskap by Johns Manville or #502 by Malarkey.

- G. Smooth modified bitumen membrane (option for reinforcing layer in base flashing assembly): Smooth surfaced, SBS modified bitumen membrane, minimum 4mm thick, meeting ASTM D 6164, Type I, such as Rubberoid mop (smooth) by GAF or approved equal.
- H. Base Flashing Assembly: Base flashings shall consist of a minimum two (2) plies (or option of one (1) layer of smooth modified bitumen membrane) reinforcement and a cool roof surfacing cap sheet.
- I. Wall Covering Assembly: Wall flashings shall consist of a minimum of one (1) ply of glass fiber felt and a cool roof surfacing cap sheet.

2.3 BITUMINOUS MATERIALS

- A. Asphalt Bitumen: ASTM D 312, Type III, Trumbull Industries or as approved by primary material manufacturer, or approved equal.
- B. Asphalt Primer: ASTM D 41 as manufactured by the primary material manufacturer.
- C. Flashing Grade Modified Roof Cement: Conforming to ASTM D-4586, Type I and ASTM D-3409. Jetblack Flashing Cement by GAF or as manufactured or approved in writing by the primary material manufacturer or approved equal.

2.4 COATING MATERIALS

A. Cool Surface Coating: White acrylic coating (for Alternate #1 and to surface all exposed roof cement in the base bid), manufactured or approved in writing by the primary material manufacturer to be included in the roof system guarantee. Coating must be listed as approved as a cool roof surfacing with an initial thermal emittance greater than or equal to 0.75 and a minimum initial solar reflectance of 0.70 as tested in accordance with CRRC-1.

2.5 INSULATION AND CANT STRIPS

- A. Insulation Crickets:
 - To provide slope behind curbs and other penetrations, as necessary to fully drain roof substrate.
 - Insulation crickets shall be pre-tapered perlite roof insulation complying with Federal Specification No. HH-I-529b, as manufactured or approved in writing by the primary material manufacturer.
- B. Cant Strips: At vertical junctures nominal 4-inch x 4-inch preformed fiberboard cant strip ASTM C 208-72, as manufactured or approved in writing by the primary material manufacturer.

2.6 FASTENERS

- A. Base Flashing to Wood Members: A 12-gauge ring shank nail fabricated from carbon steel with a 1-inch diameter head, a minimum of 1.25 inches long, as manufactured by Simplex Nails Inc. or approved equal.
- B. Base Flashing to Concrete or Masonry: A 9-gauge fluted shank masonry nail with a 1-inch diameter head, a minimum 1.25 inches long, as manufactured by Simplex Nails Inc. or approved equal.
- C. Metal Flanges to Plywood Deck: Annular threaded nail with 3/8-inch diameter head to penetrate plywood ½-inch minimum.

- D. Sheet Metal to Sheet Metal: Self-tapping sheet metal screws of minimum ½-inch length and a minimum #3 diameter.
- E. Exposed Fasteners: Shall be corrosion resistant screws with Galvalume treated heads through steel-backed EPDM (rubber) washers.

2.7 MISCELLANEOUS

- A. Elastomeric sealant shall be a low modulus, high performance, one-part polyurethane conforming to Federal Specification No. TT-S-00230C, Type II, Class A, such as Vulkem 921 or Sikaflex-15LM.
- B. Roof Protection Material A $\frac{1}{2}$ -inch thick granular surfaced asphaltic pad, a minimum 3 foot x 4 foot in dimension, as manufactured or otherwise approved by the primary material manufacturer.
- C. No. 11 ceramic roofing granules as manufactured by 3M, or approved equal. Color shall be white.

PART 3 - EXECUTION

3.1 ROOF PREPARATION

- A. Prior to installation of new roofing, Contractor shall inspect the existing roof conditions and verify that the new roof system may be installed in strict accordance with original design, the manufacturer's current recommendations and guarantee requirements, as well as, all other pertinent codes and regulations.
 - 1. Any irregular areas of substrate shall be brought to the attention of the General Contractor for correction prior to the start of work.
 - 2. Commencement of roofing application over any section will denote acceptability by the Contractor of that section, and he will be responsible for any corrective work that may be occasioned by his having started over an unsatisfactory surface.
- B. Clean all surfaces of debris and of any moisture, before proceeding with application of the new roof system.
- C. Install new inverted strips of cap sheet extending a minimum 6 inches in all directions beyond all metal straps over the substrate. Inverted cap sheet to be secured in place with standard roofing nails prior to coverage with roof system.

3.2 BASE SHEET INSTALLATION

- A. Contractor shall apply the rosin sheet directly over the cleared and swept plywood deck and over the rosin sheet, mechanically fasten the fiberglass base sheet into the plywood deck in the following manner:
 - 1. Install 4-inch cant strips at the juncture of all vertical surfaces and roof. Cants shall be nailed securely to horizontal and/or vertical wood surfaces with 3/8-inch diameter headed nails. Cant strip shall be neatly mitered in corners. Hand breaking of cant strip for corners will not be permitted.

- 2. Over the entire surface, lay one (1) ply of rosin sheet, lapping each sheet at least 2 inches over the preceding sheet. Nail sufficiently to hold in place.
- 3. Starting at the low point of the roof, install a full ply of fiberglass base sheet with the following felts applied full width, lapping each felt 2 inches over the preceding ply. Fasten the laps with approved 1-inch head fasteners placed at 9-inch centers and down the longitudinal centers of each sheet, fasten two rows spaced approximately 11 inches apart with fasteners staggered at approximately 18 inches on center. Wrinkles or ridges in the base sheet shall be cut and re-nailed to allow as smooth a surface as possible.
- 4. If staples are to be used, install one row of tape and staples on each lap, with two additional rows down the longitudinal centers of each sheet, spaced approximately 12 inches apart, with all staples spaced at 9 inches on center.
- 5. Install per Factory Mutual I-90 wind uplift requirements, including 50% additional fasteners at the building perimeters extending 40% of building height or 10% of the building width into membrane field.
- 6. Install tapered insulation cricket layers into a continuous mopping of hot asphalt, applied at a nominal rate of 30 pounds per 100 square feet over the installed base sheet.
- 7. Cant strips, tapered insulation crickets and base sheet shall not be left exposed to the weather. No more base sheet shall be applied than can be completely covered with the finished roof system on the same day.

3.3 MEMBRANE INSTALLATION

- A. Contractor shall install three (3) plies of the manufacturer's Type IV fiberglass roofing felt over the installed roof insulation system in the following manner:
 - 1. Starting at the low point of the roof, and extending to the top of the cant strip, apply 1/3 width strip of fiberglass felt into independent application of hot asphalt. Cover the first strip with a second strip 2/3 in width in hot asphalt and cover with full width fiberglass felt set into full mopping of hot asphalt. Following plies are to be applied full-width, overlapping the preceding ply in such a manner that at least three (3) plies of felt cover the base sheet or crickets in all areas. Set each ply into a full width mopping of hot asphalt applied at a nominal rate of 25 pounds per 100 square feet.
 - 2. All layers of roofing shall be laid free of wrinkles, creases or fishmouths. Plies shall be laid at right angles to the slope of the deck except where slopes exceed 1-inch per foot. Felts shall be laid directly behind asphalt applicator. Sufficient pressure shall be exerted on the roll during application to ensure prevention of air pockets.
- B. Contractor shall adhere to the following guidelines:
 - 1. Lightly broom each ply of felt in place, full width, while the bitumen is hot and fluid. Felts shall lay flat and fully bonded, in such a manner that in no area shall felt touch felt. Use only a squeegee or conduit type broom.
 - 2. Valleys and waterways shall receive an additional ply of fiberglass felt that shall be at least 36 inches wide. This ply shall be installed over the base sheet prior to the membrane application.
 - 3. Roofing materials shall not be installed during inclement weather.

- a. Roofing materials shall not be applied when moisture in any form, such as dew, can be seen or felt on the surface to which those materials are to be applied.
- b. Materials shall not be applied when foaming, blistering, or bubbling of the hot bitumen occurs.
- 4. Interply moppings of hot (at EVT) asphalt shall be continuous and applied at a nominal rate of 25 pounds per square. Application methods shall insure that all plies are completely embedded in asphalt. All interply bitumen shall be steep asphalt, Type III, 190 degrees Fahrenheit softening point.
- 5. Temperatures at the kettle shall be controlled so that bitumen temperature shall not exceed the asphalt manufacturer's maximum finished blowing temperature.
- 6. All exposed base sheet must be covered with the completed roof membrane system at the end of each day's work, with the exception of the surfacing sheet. All roof terminations and openings shall be watersealed.
- 7. Staging of the roof membrane application or temporary membrane is not acceptable. Membrane shall be installed in final form on a daily basis.
 - a. If phased roofing occurs as a result of emergency conditions, install additional plies over phased areas so that a continuous three (3) ply system is installed.
- 8. Thermostatic controls and visible thermometer shall be provided on tanker and/or kettle, maintained in working order and calibrated.
- 9. Foot and wheeled traffic shall be kept off the newly installed membrane until asphalt has sufficiently cured to prevent displacement voids.
- 10. All membrane deficiencies such as voids, bridging, fishmouths, cuts, tears, etc., shall be repaired in an acceptable manner. Incorporate into such repairs as many plies as are affected by the deficiency.
- 11. Air void pockets, as determined by test samples, shall not exceed 8% per interply mopping for individual sample and average of all samples shall be less than 5% per interply mopping. If corrective action is required, cut the roofing felts down to the void and cover with three (3) plies of fiberglass felt set into hot asphalt applied at a nominal rate of 25 pounds per 100 square feet.

C. Surfacing:

- 1. New Cool Roof Cap Sheet Surfacing:
 - a. Starting at the low point, apply one (1) layer of new cool roof surfacing cap sheet, being sure to maintain 2-inch side laps and 6-inch end laps over the preceding sheets. Cut 12 to 18 foot lengths of cap sheet and flop into a full width mopping of hot bitumen applied at a nominal rate of 30 pounds per 100 square feet. Temperature of the asphalt when applied must be such that, when the cap sheet is set into it, its temperature is approximately 20 degrees Fahrenheit above the EVT. The cap sheet must be firmly and uniformly set into the bitumen with all edges well sealed.

- b. Loose granules are to be carried throughout the cap sheet application to be broadcast over excess bitumen seepage, spillage, etc., in order to maintain the aesthetic quality of the cap sheet.
- c. Areas where granules are embedded shall be coated with cool surface coating.
- D. Bitumen heating requirements shall be as follows:
 - 1. Maximum asphalt temperature in heating equipment:
 - a. Asphalt shall not be heated to the minimum flash point.
 - b. The minimum finished blowing temperature shall not be exceeded for more than a total of 4 hours, for any asphalt batch or portion thereof.
 - c. Remove from the project any asphalts heated above these limits.
 - 2. Temperature at time and point of application:
 - a. Roof asphalt shall be heated to within a range of plus or minus 25 degrees Fahrenheit of its equiviscous temperature when applied in the roof system. The equiviscous temperature shall be defined as the temperature at which asphalt viscosity is 125 centipoise for application by mopping and 75 centipoise for application by mechanical spreader. Application temperature shall be measured at the mop cart or mechanical spreader immediately before application.
 - Asphalts not meeting these criteria are to be reheated or allowed to cool, as required.

3.4 FLASHING INSTALLATION

- A. General Flashing Specifications:
 - 1. All flashing must be completed daily; however, base flashing surfacing may be delayed so long as fiberglass reinforcing plies are properly set into a solid mopping of asphalt as specified below and the top, exposed edge is sealed using roof cement to create a temporary waterseal.
 - 2. All other flashing not specifically detailed herein will be applied in accordance with manufacturer's specifications.
 - 3. All sheet metal that will come in contact with bituminous materials shall be primed with an asphaltic primer and allowed to dry before applying bitumen.
- B. Contractor shall install flashings at vertical wall and curb surfaces that abut the built-up roof in the following manner:
 - 1. Prime concrete and metal surfaces with asphaltic primer applied at a nominal rate of 1 gallon per 100 square feet, and allow proper drying prior to applying bitumen.
 - 2. Embed not less than two (2) plies of fiberglass felt into solid moppings of hot steep asphalt over junctures, extending from the top of the vertical flashing surface or 12 inches at vertical surfaces that extend more than 24 inches above roof membrane and down to a point at least 2 and 4 inches past the toe of the cant strip onto the roof.

A smooth modified bitumen membrane may be used as the base flashing reinforcement in lieu of the two (2) plies of fiberglass felt referenced above. With this substitution, modified bitumen membrane must extend minimum 4 inches past toe of cant and minimum 12 inches above new roof surface.

- 3. Over the preceding reinforcing plies (or modified bitumen membrane), install the cool roof cap sheet base flashing ply per the manufacturer's current recommendations. The flashing membrane shall be of sufficient width to extend from the top of the vertical flashing surface or 12 inches at vertical surfaces that extend more than 24 inches above roof membrane and down to a minimum of 6 inches past the toe of the cant strip onto the roof, or 2 inches further onto the roof than the preceding ply.
- 4. Fasten the top edge of the base flashing approximately every 6 inches on center with appropriate fasteners through 1-inch diameter metal discs.
- 5. Seal corners and the top edges (where under counterflashing) of the base flashings with woven fiberglass flashing fabric (4 inches wide) embedded into and covered over with flashing grade roof cement, centered over the top edge of the base flashings.
- 6. Completely bond all flashings to the underlying surface without any looseness, bubbles or voids. Remove and replace any loose flashings.
- 7. A minimum of 30 days after completion of project, all exposed roof cement is to be surfaced with an appropriate coating material to maintain the aesthetics of the roof.
- C. Wall covering systems shall consist of one (1) ply and a cool roof surfacing cap sheet. Wall covering systems shall overlap the base flashing system by a minimum of 4 inches.
- D. Contractor shall install roof drain flashings as follows:
 - 1. Drain rings shall be removed prior to built-up roofing application.
 - 2. The 4 pound lead flashing sheet shall be set into a solid coating of modified flashing grade roof cement over the installed roofing plies. Install two (2) stripping plies of fiberglass felt over the installed lead flashing. Stripping plies shall extend 3 inches and 6 inches past the edge of the lead flashing sheet and remain in the sump area. All plies, including the lead flashing and field plies must extend into the drain and under the clamping ring.
 - 3. The drain ring shall be secured with firm compression by bolts through washers. Guard screen shall be installed over drains.
 - 4. The primary drain and overflow drain clamping ring locations must be verified.
- E. Contractor shall flash flanged metal components in the following manner:
 - 1. All flanges of lead and galvanized sheet metal flashings are to be primed and stripped-in with two (2) plies of fiberglass roofing felt embedded into hot asphalt. The first ply will extend a minimum of 3 inches beyond the flange onto the roof. The second ply will extend a minimum of 3 inches further onto the roof than the first ply. After the cap sheet application, seal the cut edge of the cap sheet using a three-course application of woven glass fabric embedded into and covered over with flashing grade roof cement.
- F. Upon completion of work, all exposed roof cement (including three-course applications) must be coated with an application of cool surface coating at a rate of 3 gallons per 100 square feet.

3.5 TEMPORARY WATER CUT-OFFS

- A. Uninterrupted waterstops shall be installed at the end of each day's work, and be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.
- B. All temporary waterstops shall be constructed to provide a 100% watertight seal. The new membrane shall be carried into the waterstops. The waterstops shall be sealed to the deck or substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, etc. shall be removed from the work area and properly disposed of off site. None of these materials shall be used in the new work.
- C. If inclement weather occurs while a temporary waterstop is in place the Applicator shall provide the labor necessary to monitor the situation to maintain a watertight condition.
- D. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense.

3.6 CLEAN-UP

- A. Contractor shall remove bituminous markings from finished surfaces. In areas where finished surfaces are soiled by bitumen or any other source, caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to instructions.
- B. All roofing, flashings and metal work removed for construction shall be immediately taken off the site to a legal dumping area authorized to receive such materials. Any hazardous materials are to be removed and disposed of in accordance with applicable City, State, and Federal requirements.
- C. All new roofing waste material (i.e., scrap roof membrane, empty material cans) shall be immediately removed from the site by the Applicator and properly transported to a legal dumping area authorized to receive such material, in a legal manner.
- D. Site clean-up, including both interior and exterior building areas which have been affected by construction, shall be completed to the Owner's satisfaction.
- E. Applicator shall keep the roof and premises clean and free from accumulations of waste materials and rubbish at all times. He shall remove all debris, scrap and rubbish from the work area daily.

3.7 MISCELLANEOUS WORK ITEMS

A. Walkpads:

- Contractor shall install walkpads as indicated in the Special Base Bid Scope of Work Items above.
- 2. Walkpads shall be installed into a five spot application of roof cement over the completed roof system.
- 3. Where applicable, the walkpad installation shall protect the cant strip area of the base flashing in addition to the horizontal surface of the roof.
- B. Surfaces to receive elastomeric sealant shall be thoroughly cleaned and primed per manufacturer's recommendations.

- C. All mechanical units are to be secured to their respective platforms and/or wood supports with new 24-gauge galvanized sheet metal strips a minimum 1-inch wide. Strapping is to be secured with screws through steel/EPDM rubber washers with the screws installed through vertical surfaces only.
- D. Coat any exposed roof cement at the completion of the project with the specified cool surface coating. Coating must be installed only after the roof cement has skinned over.
- E. Where waterflow is obstructed, install crickets to eliminate the potential of ponding water. Crickets shall be formed from pre-tapered perlite roof insulation to be set into an application of asphalt over the installed base sheet.

3.8 FINAL INSPECTION

- A. An Owner's Representative, Roofing Consultant and Architect shall, with the Contractor, inspect the entire completed roof system, including surfacing, membrane, flashings, metal components, etc. Any deficiencies or incomplete work items will be noted at this time and documented. A punchlist of all such items will be issued to the Contractor.
- B. It is the Contractor's responsibility to verify and certify that all punchlist items have been completed to the Owner's satisfaction.

END OF SECTION 075140

SECTION 080152.93 - HISTORIC TREATMENT OF WOOD WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Wood window repair.
- 2. Reglazing.
- 3. Window hardware repair, refinishing, and replacement.
- 4. Insect screens (ADD ALTERNATE ITEM NO. 12 SEE DRAWINGS).

** Note: The original historic wood double-hung windows remain extant on the fourth floor only. Two addition historic fixed wood windows remain on the ground floor flanking the main hotel Entrance. The general condition of the existing historic wood windows is fair. All other windows were replaced ca. 1989 and are generally in good working condition. The specifications shall be used as a guide for treatment of the historic wood windows.

B. Related Section:

 Division 08 Section "Wood Windows" for replacement wood windows or new replacement sash not included in this Section.

1.3 DEFINITIONS

- A. General: See Division 01 Section "Historic Treatment Procedures" for other definitions.
- B. Wood Window Component Terminology: As identified in AWI's "Architectural Woodwork Quality Standards." Wood window components for historic treatment work include the following classifications:
 - 1. Frame Components: Head, jamb, and sill.
 - 2. Sash Components: Stile and rails, parting bead, stop, and muntins.
 - 3. Exterior Trim: Exterior casing, brick mould, and drip cap.
 - 4. Interior Trim: Casing, stool, and apron.
- C. Design Reference Sample: A Sample that represents Architect's prebid selection of work to be matched; it may be existing work or specially produced for Project.
- D. Glazing: Includes glass, glazing points, glazing tapes, glazing sealants, and glazing compounds.
- E. Window: Includes window frame, sash, storm window, shutters, and louvered blinds unless otherwise indicated by the context.

1.4 QUALITY ASSURANCE

- A. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation. Prepare mockups so they are inconspicuous or reversible.
 - 1. Locate mockups on the building where directed by Architect.
 - 2. Wood Window Repair: Prepare one entire window unit to serve as mockup to demonstrate sample repairs of wood window members including frame, sash, glazing, and hardware.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- B. WI Quality Standard: Comply with WI's "Manual of Millwork" for construction, finishes, grades of wood windows, and other requirements.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with historic treatment of wood windows only when existing and forecasted weather conditions are within the environmental limits set by each manufacturer's written instructions and specified requirements.
- B. Concealed and undocumented historic items, relics, and similar objects encountered during historic treatment remain Owner's property. Carefully dismantle and salvage each item or object.

1.6 SEQUENCING AND SCHEDULING

- A. Perform historic treatment of wood windows in the following sequence:
 - 1. Stamp each window frame with permanent opening-identification number in inconspicuous location.
 - 2. Allow installation of temporary protection and security at window openings according to Division 01 Section "Temporary Facilities and Controls."
 - 3. Clean surfaces.
 - 4. General Wood-Repair Sequence:
 - a. Remove loose flaky paint to sound substrate.
 - b. Rack frames slightly; inject adhesive into mortise and tenon joints.
 - c. Repair wood by consolidation, member replacement, partial member replacement, and patching.
 - d. Sand, prime, fill, sand again, and prime surfaces again for refinishing according to Division 09 Section "Maintenance of Painting and Coating."
 - 5. Repair, refinish, and replace hardware if required. Reinstall essential operating hardware.
 - 6. Install glazing.
 - 7. Allow removal of temporary protection and security at window openings according to Division 01 Section "Temporary Facilities and Controls."
 - 8. Reinstall units.
 - 9. Install remaining hardware and weather stripping.

PART 2 - PRODUCTS

2.1 REPLACEMENT WOOD MATERIALS

- A. Wood: Clear fine-grained lumber; kiln dried to a moisture content of 6 to 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch (0.8 mm) deep by 2 inches (51 mm) wide.
 - 1. Species: Match species of each existing type of wood product.

2.2 WOOD REPAIR MATERIALS

- A. Wood Consolidant: Ready-to-use product designed to penetrate, consolidate, and strengthen soft fibers of wood materials that have deteriorated due to weathering and decay and designed specifically to enhance the bond of wood-patching compound to existing wood.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Abatron, Inc.; LiquidWood.
- B. Wood-Patching Compound: Two-part epoxy-resin wood-patching compound; knife-grade formulation as recommended by manufacturer for type of wood repair indicated, tooling time required for the detail of work, and site conditions. Compound shall be designed for filling voids in damaged wood materials that have deteriorated due to weathering and decay. Compound shall be capable of filling deep holes and spreading to feather edge.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Abatron, Inc.; LiquidWood with WoodEpox.

2.3 GLAZING MATERIALS

A. Glass: Uncoated clear float-glass unless noted otherwise in the drawings.

2.4 WINDOW HARDWARE

- A. General: Provide complete sets of window hardware consisting of sash balances, hinges, pulls, latches, and accessories indicated for each window or required for proper operation. Window hardware shall smoothly operate, tightly close, and securely lock wood windows and be sized to accommodate sash or ventilator weight and dimensions.
- B. Window Hardware Finishes: Comply with BHMA A156.18 for base material and finish requirements indicated by the following:
 - 1. BHMA 613: Dark-oxidized satin bronze, oil rubbed, bronze base metal.

2.5 INSECT SCREENS (ALTERNATE BID ITEM NO. 12)

- A. Aluminum Insect-Screen Frames: Extruded aluminum custom fabricated to fit inside interior frame of wood windows; tight fitting and removable, with a minimum of exposed fasteners and latches; finish as indicated; concealed from exterior view.
 - 1. Mounting: Manufacturer's standard mounting consisting of extruded-aluminum guide at sill with screw attachment at head and jambs.

- Baked-Enamel or Powder-Coated Finish: Color matching Sherwin Williams SW 2847, Roycroft Bottle Green.
- B. Aluminum Wire Fabric: 18-by-16 count per sq. in. (645-sq. mm) mesh of 0.011-inch- (0.28-mm-) diameter, coated aluminum wire; charcoal gray finish.

2.6 MISCELLANEOUS MATERIALS

A. Cleaning Materials:

- 1. Detergent Solution: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate, 1/2 cup (125 mL) of laundry detergent that contains no ammonia, 5 quarts (5 L) of 5 percent sodium hypochlorite bleach, and 15 quarts (15 L) of warm water for each 5 gal. (20 L) of solution required.
- 2. Mildewcide: Provide commercial proprietary mildewcide or a solution prepared by mixing 1/3 cup (80 mL) of household detergent that contains no ammonia, 1 quart (1 L) of 5 percent sodium hypochlorite bleach, and 3 quarts (3 L) of warm water.
- B. Adhesives: Wood adhesives for exterior exposure, with minimum 15- to 45-minute cure at 70 deg F (21 deg C), in gunnable and liquid formulations as recommended by adhesive manufacturer for each type of repair.
- C. Fasteners: Fasteners of same basic metal as fastened metal unless otherwise indicated. Use metals that are noncorrosive and compatible with each material joined.
 - 1. Match existing fasteners in material and type of fastener unless otherwise indicated.
 - 2. Use concealed fasteners for interconnecting wood components.
 - 3. Use concealed fasteners for attaching items to other work unless exposed fasteners are the existing fastening method.
 - 4. For exposed fasteners, use Phillips-type machine screws of head profile flush with metal surface unless otherwise indicated.
 - 5. Finish exposed fasteners to match finish of metal fastened unless otherwise indicated.
- D. Anchors, Clips, and Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel complying with requirements in ASTM B 633 for SC 3 (Severe) service condition.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect adjacent materials from damage by historic treatment of wood windows.
- B. Clean existing wood windows of mildew, algae, moss, plant material, loose paint, grease, dirt, and other debris by scrubbing with bristle brush or sponge and detergent solution. Scrub mildewed areas with mildeweide. After cleaning, rinse thoroughly with fresh water. Allow to dry before repairing or painting.
- C. Condition replacement wood members and replacement windows to prevailing conditions at installation areas before installing.
- 3.2 HISTORIC TREATMENT PROCEDURES, GENERAL

- A. General: Have historic treatment of wood windows directed and performed by a qualified historic treatment specialist. Ensure that historic treatment specialist's field supervisors are present when historic treatment of wood windows begins and during its progress. In treating historic items, disturb them as minimally as possible and as follows:
 - 1. Follow the historic treatment sequence in "Sequencing and Scheduling" Article.
 - 2. Apply each product according to manufacturer's written instructions unless otherwise indicated.
 - 3. Stabilize and repair wood windows to reestablish structural integrity and weather resistance while maintaining the existing form of each item.
 - 4. Repair items in place where possible and retain as much original material as possible.
 - 5. Replace or reproduce historic items where indicated or scheduled.
 - 6. Make historic treatment of materials reversible whenever possible.
 - 7. Install temporary protective measures to protect wood window work that is indicated to be completed later.
- B. Mechanical Abrasion: Where mechanical abrasion is needed for the work, use only the gentlest mechanical methods, such as scraping and natural-fiber bristle brushing, that will not abrade wood substrate, reducing clarity of detail. Do not use abrasive methods such as sanding, wire brushing, or power tools except as indicated as part of the historic treatment program and as approved by Architect.
- C. Repair and Refinish Existing Hardware: Dismantle window hardware; repair and refinish it to match finish samples.
- D. Repair Wood Windows: Match existing materials and features, retaining as much original material as possible to perform repairs.
 - Unless otherwise indicated, repair wood windows by consolidating, patching, splicing, or otherwise reinforcing wood with new wood matching existing wood or with salvaged, sound, original wood.
 - 2. Where indicated, repair wood windows by limited replacement matching existing material.
- E. Protection of Openings: Where sash or windows are indicated for removal, cover resultant openings with temporary enclosures so that openings are weathertight during repair period.
- F. Identify removed windows, sash, and members with numbering system corresponding to window locations to ensure reinstallation in same location. Key windows, sash, and members to Drawings showing location of each removed unit. Permanently stamp units in a location that will be concealed after reinstallation.

3.3 GLAZING

A. Remove cracked and damaged glass and glazing materials from openings and prepare surfaces for reglazing.

3.4 WOOD WINDOW PATCH-TYPE REPAIR

- A. General: Patch wood members that are damaged and exhibit depressions, holes, or similar voids, and that have limited rotted or decayed wood.
 - 1. Remove sash from windows before performing patch-type repairs at meeting or sliding surfaces unless otherwise indicated. Reglaze units prior to reinstallation.
 - 2. Verify that surfaces are sufficiently clean and free of paint residue prior to patching.

- 3. Treat wood members with wood consolidant prior to application of patching compound. Coat wood surfaces by brushing, applying multiple coats until wood is saturated and refuses to absorb more. Allow treatment to harden before filling void with patching compound.
- 4. Remove rotted or decayed wood down to sound wood.
- B. Apply wood-patching compound to fill depressions, nicks, cracks, and other voids created by removed or missing wood.
 - 1. Prime patch area with application of wood consolidant or manufacturer's recommended primer.
 - 2. Mix only as much patching compound as can be applied according to manufacturer's written instructions.
 - Apply patching compound in layers as recommended by manufacturer until the void is completely filled.
 - 4. Finish patch surface to match contour of adjacent wood member. Sand patching compound smooth and flush, matching contour of existing wood member.
 - 5. Clean spilled compound from adjacent materials immediately.

3.5 INSECT SCREEN INSTALLATION

- A. Install aluminum insect screen frames for each operable exterior sash or ventilator.
 - 1. Locate insect screen frames on [outside] of window unless otherwise indicated.
 - Install insect screen frames by mounting to window or sash frameaccording to manufacturer's written instructions.
- B. Install insect screening to be smooth, flat, and uniformly taut.

3.6 ADJUSTMENT

A. Adjust existing and replacement operating sash, screens, hardware, weather stripping, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.7 CLEANING AND PROTECTION

- A. Protect window surfaces from contact with contaminating substances resulting from construction operations. Monitor window surfaces adjacent to and below exterior concrete and masonry during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances contact window surfaces, remove contaminants immediately according to glass manufacturer's written recommendations.
- B. Clean exposed surfaces immediately after historic treatment of wood windows. Avoid damage to coatings and finishes. Remove excess sealants, glazing and patching materials, dirt, and other substances.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 080152.93

SECTION 081433 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior stile and rail wood doors.
 - 2. [Priming] stile and rail wood doors.
- B. Related Sections:
 - 1. Division 09 Section "Interior Painting" for field finishing stile and rail doors.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain stile and rail wood doors from single manufacturer.
- B. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201, for Category II materials, unless those of Category I are expressly indicated and permitted.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written instructions and requirements of quality standard referenced in Part 2.
- B. Package doors individually in opaque plastic bags or cardboard cartons.
- C. Mark each door on top and bottom edge with opening number used on Shop Drawings.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between [17 and 50] percent during the remainder of the construction period.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship, or have warped (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
 - 1. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Interior Doors: [Five years].

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Use only materials that comply with referenced standards and other requirements specified.
 - Assemble interior doors, frames, and sidelites, including components, with either dry-use or wetuse adhesives complying with ASTM D 5572 for finger joints and with ASTM D 5751 for joints other than finger joints.
- B. Panel Products: Any of the following:
 - 1. Particleboard made from wood particles, complying with ANSI A208.1, Grade M-2.
 - 2. Veneer core plywood.

2.2 INTERIOR STILE AND RAIL WOOD DOORS

- A. Interior Stile and Rail Wood Doors: Custom interior doors complying with AWI's "Architectural Woodwork Quality Standards," and with other requirements specified.
 - 1. Panel Designs: Indicated by Drawings. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
 - 2. Grade: Custom.
 - 3. Finish: Opaque.
 - 4. Door Construction for Opaque Finish:
 - a. Stile and Rail Construction: Clear softwood; may be edge glued for width and finger jointed.
 - b. Flat-Panel Construction: Veneered, wood-based panel product.
 - 5. Stile and Rail Widths: As indicated.
 - 6. Flat-Panel Thickness: 1/2 inch (13 mm)
 - 7. Molding Profile (Sticking): Ogee.
 - 8. Glass: Uncoated, clear, fully tempered float glass, 5.0 mm thick, complying with Division 08 Section "Glazing."
 - 9. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

2.3 STILE AND RAIL WOOD DOOR FABRICATION

A. Fabricate stile and rail wood doors in sizes indicated for field fitting.

- B. Glazed Openings: Trim openings indicated for glazing with solid wood moldings, with one side removable. Miter wood moldings at corner joints.
- C. Transom and Side Panels: Fabricate panels to match adjoining doors in materials, finish, and quality of construction.

2.4 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime doors with one coat of wood primer specified in Division 09 Section "Interior Painting." Seal all four edges, edges of cutouts, and mortises with primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and substrates, with Installer present, for suitable conditions where wood stile and rail doorswill be installed.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Install wood doors to comply with manufacturer's written instructions, AWI's "Architectural Woodwork Quality Standards," and other requirements specified.
- C. Field-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6 mm) from bottom of door to top of threshold.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

END OF SECTION 081433

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply of this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Door Hardware, including electric hardware.
 - 2. Storefront and entrance door hardware.
 - 3. Padlocks.
 - 4. Cylinders for doors fabricated with locking hardware.
 - 5. Key cabinets.

B. Related Sections:

- 1. Section 08 14 33- Stile and Rail Wood Doors.
- C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.
 - 1. Windows.
 - 2. Cabinets, including open wall shelving and locks.
 - 3. Signs, except where scheduled.
 - 4. Toilet accessories, including grab bars.
 - 5. Installation.
 - 6. Rough hardware.
 - 7. Folding partitions, except cylinders where detailed.

1.3 REFERENCES:

- A. Use date of standard in effect as of Bid date.
- B. American National Standards Institute ANSI 156.18 Materials and Finishes.
- ANSI A117.1 Specifications for making buildings and facilities usable by physically handicapped people.
- D. ADA Americans with Disabilities Act of 1990
- E. BHMA Builders Hardware Manufacturers Association
- F. DHI Door and Hardware Institute
- G. NFPA National Fire Protection Association
 - 1. NFPA 80 Fire Doors and Windows
 - 2. NFPA 101 Life Safety Code
 - 3. NFPA 105 Smoke and Draft Control Door Assemblies
 - 4. NFPA 252 Fire Tests of Door Assemblies

H. UL – Underwriters Laboratories

- 1. UL10C Fire Tests of Door Assemblies (Positive Pressure)
- 2. UL 305 Panic Hardware

- I. WHI Warnock Hersey Incorporated
- J. State of California Building Code
- K. SDI Steel Door Institute
- L. WDI Wood Door Institute
- M. AWI Architectural Woodwork Institute

1.4 SUBMITTALS & SUBSTITUTIONS

- A. SUBMITTALS: Submit six copies of schedule per Division 1. 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. Include following information:
 - 1. Type, style, function, size, quantity and finish of hardware items. Use BHMA Finish codes per ANSI A156.18.
 - 2. Name, part number and manufacturer of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of hardware set coordinated with floor plans and door schedule.
 - 5. Explanation of abbreviations, symbols, and codes contained in schedule.
 - 6. Mounting locations for hardware.
 - 7. Door and frame sizes, materials and degrees of swing.
 - 8. List of manufacturers used and their nearest representative with address and phone number.
 - 9. Catalog cuts.
 - 10. Manufacturer's technical data and installation instructions for electronic hardware.
 - 11. Date of jobsite visit.
- B. Bid and submit manufacturer's updated/improved item if scheduled item is discontinued.
- C. Make substitution requests in accordance with Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.
- D. Furnish as-built/as-installed schedule with closeout documents, including keying schedule, wiring/riser diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

1.5 OUALITY ASSURANCE:

- A. Qualifications:
 - 1. Hardware supplier: direct factory contract supplier who employs a certified architectural hardware consultant (AHC), available at reasonable times during course Work for project hardware consultation to Owner, Architect and Contractor.
 - (1) Responsible for detailing, scheduling and ordering of finish hardware.
- B. Hardware: New, free of defects, blemishes and excessive play. Obtain each kind of hardware from one manufacturer.
- C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.
- D. Fire-Rated Openings: In compliance with NFPA 80. Hardware UL10C/UBC-7-2 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, plus resilient and required intumescent seals. Submit verification of positive pressure listing and label document from testing laboratory for door closers. Furnish openings complete.

- 1. Note: scheduled seals may exceed selected door manufacturer's requirements. See 2.6.E for clarification.
- E. Pre-Installation Meetings: Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Convene at least one week prior to commencement of related work.

1.6 DELIVERY, STORAGE AND HANDLING:

- A. Delivery: coordinate delivery to appropriate locations (shop or field).
 - 1. Permanent keys and cores: secured delivery direct to Owner's representative.
- B. Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.
- C. Storage: Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, abusive materials and weather.

1.7 PROJECT CONDITIONS:

A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical as the same operation and quality as type specified, subject to Architect's approval.

1.8 SEQUENCING AND COORDINATION:

- Coordinate with concrete.
- B. Reinforce walls.
- C. Coordinate finish floor materials and floor-mounted hardware.
- D. Furnish manufacturer templates to door and frame fabricators.
- E. Use hardware consultant to check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.
 - 1. Confirm that door manufacturers and frame manufacturer furnish necessary UBC-7-2 compliant seal packages.

1.9 WARRANTY:

A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' warranties:

1. Closers: Five years mechanical, two years electrical.

Exit Devices: Three years.
 Hinges: Two years.
 Other Hardware: Two years.

1.10 COMMISSIONING:

A. Test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.

1.11 PROJECT/SITE CONDITIONS

Environmental Concern for Packaging:

Pack hardware shipped to the jobsite in biodegradable materials as paper or cardboard boxes. If non-biodegradable packing is utilized; as plastic, plastic bags, styrofoam; the Contractor will be responsible to dispose of the non-biodegradable packing to a license or authorized collector for recycling of the non-biodegradable packing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers: Provide units Listed manufacturers or equivalent products with equal function and features by one of the following:

ITEM:	MANUFACTURER:	ACCEPTABLE SUB:
Hinges	(IVE) Ives	Hager, Stanley
Key System	(SCH) Schlage	Owner's Standard
Locks	(SCH) Schlage	Owner's Standard
Guest Room Locks	(SCH) Schlage	Owner's Standard
Exit Devices	(VON) Von Duprin	Owner's Standard
Closers-Mechanical	(LCN) LCN	Owner's Standard
Flush Bolts	(IVE) Ives	DCI, Hager
Silencers	(IVE) Ives	Hager, Trimco
Kickplates	(IVE) Ives	Hager, Trimco
Stops & Holders	(IVE) Ives	Hager, Trimco
Overhead Stops	(GLY) Glynn-Johnson	None available
Thresholds	(NGP) National Guard	Pemko, Zero
Seals & Bottoms	(NGP) National Guard	Pemko, Zero

- B. Provide hardware items required to complete the work in accordance with these specifications and manufacturers' instructions.
 - 1. Include items inadvertently omitted from this specification. Note these items in submittal for review
 - 2. Where scheduled item is now obsolete, bid and furnish manufacturers updated item at no additional cost to the project.

2.2 HANGING MEANS:

- A. Conventional Hinges: hinge open widths minimum, but of sufficient throw to permit maximum door swing. Steel or stainless steel pins and concealed bearings.
 - 1. Three hinges per leaf to 7 feet. Add one for each additional 30 inches in height, or any fraction thereof.
 - 2. Extra heavy weight hinges on doors over 3 foot, 5 inches in width.
 - 3. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins.
 - 4. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
 - 5. Provide shims and shimming instructions for proper door adjustment.
 - 6. Provide Ball Tips for Butt Hinges

A. Locksets.

- Chassis: lock design as scheduled with corrosion-resistant plated cold-rolled steel, through-bolted.
- 2. Lever Trim: accessible design, independent operation, spring-cage supported, minimum 1/2" clearance from door on the return.
- 3. Strikes: 16 gage curved steel, bronze or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
 - a. Lock Series Mortise Lock, Schlage L9000, 17A Design.
 - b. Lock Series Cylindrical Locks, Schlage ND, Sparta Design.
 - c. Lock Series Combination, Schlage S200, Neptune Design.

B. Hotel Guest Room Locksets.

- 1. Schlage Mortise type, CO250 MD with deadbolt, programmable offline operated by coded magnetic stripe card.
- 2. Programming interface of lockset by a Hand Held Device (HHD), with all cables, in conjunction with the Schlage SMS Select Software.
- 3. Provide 300 Magnetic Stripe Cards, MAG3.
- 4. Mechanical Key Override.
- 5. Lever design Sparta.
- 6. ANSI/BHMA 156.25, Grade 1 certified and UL 294 Listed.
- 7. Provide with Magnetic Strike Card Encoder, CL-ENCODER-2, SMS Server and Software, SSEL-SVR-1, and a minimum of sixteen hours of training performed by an IR Certified Factory Trained Instructor.
- 8. Refer to DIVISION 1 as alternate bid item.

C. Exterior Access Control System.

- 1. Integrate into the existing Schlage Bright Blue System.
- 2. Provided set up in the entry hardware set as described with proximity reader. Alternate Bid item. Refer to DIVISION 1.

2.4 CLOSERS

A. Surface Closers:

- 1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Heat-treated pinion shaft, single piece forged piston, and steel spring.
- 2. ISO 2000 certified. Units stamped with date-of-manufacture code.
- 3. Steel plated wood screws at wood doors provided with closer blocking in door and frame. Non-sized, non-handed, and adjustable. Place closer inside building, stairs, and rooms.
- 4. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.
- 5. Opening pressure: Exterior doors 5 lb., interior doors 5 lb., labeled fire doors up to 15 lb.
- 6. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.
- 7. Non-flaming fluid will not fuel door or floor covering fires. Submit label information that closers have been certified to be installed on label openings, under the testing procedures of UL10C, and carry a label to comply with UBC7-2.
- 8. Finish: Plated cover and arms.

2.5 OTHER HARDWARE

- A. Overhead Stops: Bronze. Non-plastic mechanisms and finished metal end caps.
- B. Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze to match other hardware.
- C. Door Stops: Provide stops to protect walls, casework or other hardware.
- D. Seals: Finished to match adjacent frame color. Resilient seal material: solid high-grade neoprene. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability. Proposed substitutions: submit for approval.
 - 1. Solid neoprene: MIL Spec. R6855-CL III, Grade 40.
 - 2. Fire-rated Doors, Resilient Seals: UL10C/UBC-7-2 compliant. Coordinate with selected door manufacturers and selected frame manufacturer's requirements. Where rigid housed resilient seals are scheduled in this section and the selected door manufacturer only requires an adhesive mounted resilient seal, furnish rigid housed seal at minimum, or both the rigid housed seal and the adhesive applied seal if necessary to fulfill door manufacturer's requirement. Adhesive applied seal alone is deemed insufficient for this project where rigid housed seals are scheduled.
 - 3. Fire-rated Doors, Intumescent Seals: Furnish fire-labeled opening assembly complete and in full compliance with UL10C/UBC-7-2. Furnished by selected door manufacturer, these seals vary in requirement by door type and door manufacture. Adhesive applied intumescent strips are not acceptable. Careful coordination required.
- F Automatic door bottoms: low operating force units. Doors with automatic door bottoms plus head and jamb seals cannot require more than two pounds operating force to open when closer is disconnected.
- G. Thresholds: As scheduled and per details. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval.
- H. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression. Thresholds to be fasten with brass machine screws and metal anchors.
- J. Silencers: Interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Leave no unfilled/uncovered pre-punched silencer holes.

2.8 FINISH:

- A. Generally BHMA 613, Oil Rubbed Bronze. Door closers: factory painted cover and arms to match finish of locksets.
- B. Aluminum items: match predominant adjacent material. Seals to coordinate with frame color.
- C. Pair of main entry doors finish, GHMA 605, Bright Brass.

2.9 KEYING REQUIREMENTS:

- A. Key Systems: Schlage Keying System. Key blanks available only from factory-direct sources, not available from after-market key blank manufacturers. Factory Grand Master Keying. Initiate and conduct meeting with Owner to determine the addition to the existing system keyway and structure, furnish Owner's written approval of the system.
- B. Construction keying: Cylinders Cores are to be construction keyed.
- C. Locksets and cylinders: keyed at factory of lock manufacturer where permanent records are maintained. Meet and refer to the owner for specific keying instructions.
- D. Permanent keys and cores: secured shipment direct from point of origination to Owner's representative. The owner will determine who installs the permanent cores and removes the construction cores.
- E. Provide a bitting List: Secured shipment direct from point of origination to Owner upon completion.
- F. Provide keys: Two Master Keys; two; four change keys per cylinder.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS:

A. Factory trained, certified, and carries a factory-issued card certifying that person as a "Certified Installer". Alternative: can demonstrate suitably equivalent competence and experience.

3.2 PREPARATION:

- A. Ensure that walls and frames are square and plumb before hardware installation.
- B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.
 - 1. Notify Architect of any code conflicts before ordering material.
 - 2. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

3.3 INSTALLATION

- A. Install hardware per manufacturer's instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.
 - 1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
 - 2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.
 - 3. For existing frames, Dutchman the existing strike preparation before installation of the new provide strike.
 - 4. For the Unit Guest Room Locks, route out the necessary space for the new mortise lock and drill the necessary surface holes to accomplish installation. The Contractor is to notify the Architect and Owner immediately if there is a problem installing the lockset in the

existing cutouts and if surface holes from previous installations are not cover by the inside or outside plates.

- B. Locate floor stops not more than 4 inches from the wall.
- C. Drill pilot holes for fasteners in wood doors and/or frames.
- Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

3.4 ADJUSTING

- A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.
 - 1. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner's satisfaction.
- B. Inspection: Use hardware supplier. Include suppliers with closeout documents.
- C. Follow-up inspection: Installer to provide letter of agreement to Owner that approximately 6 months after substantial completion, installer will visit Project with representatives of the manufacturers of the locking devices and door closers to accomplish following:
 - 1. Re-adjust hardware.
 - Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.
 - 3. Identify items that have deteriorated or failed.
 - 4. Submit written report identifying problems and likely future problems.

3.5 DEMONSTRATION:

A. Demonstrate electrical, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.6 PROTECTION/CLEANING:

- A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.
- B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

3.7 SCHEDULE OF FINISH HARDWARE

- A. See door schedule in drawings for hardware set assignments.
- B. Manufacturers and their abbreviations used in this schedule:

GLY Glynn-Johnson

IVE H. B. Ives

LCN LCN Closers

MAG Mag Secuity

NGP National Guard Product

SCE Schlage Electronic Security

SCH Schlage Lock Company

Heading 001-AL

131 SGL DOORUNITS ALT # 9 CORRIDOR / LIVING UNITS 3'0" x 6'8" x 1-3/4" x XWDD x XWDF x NON-RTD ALTERNATE BID # 9

Each Assembly	y to have:
---------------	------------

1	EA	CONSTRUCTION CORE 23-030-ICX		626	SCH
1	EA	ELECTRONIC LOCK	CO-250-MD-70-MS-SPA-PD	613	SCE
	DUTCHMAN THE EXISTING STRIKE PREPS ON THE FRAME				

Heading 002-AL

1 SGL DOORMISC- ALT #9

varies x varies x varies x x x NON-RTD Opening Remark: PART OF ALTERNATE # 9 MISCELLANEOUS ALTERNATE # 9

Each Assembly to have:

1	EA	MAG STRIPE ENCODE	RCL-ENCODER-2	SCE
1	EA	HANDHELD DEVICE	HHD KIT	SCE
300	EA	MAG STRIPE CARD	MAG3	SCE
1	EA	SMS SERVER &	SSEL-SVR-1	SCE
		SFTWARE		
1			TRAINING 16 HOURS	SCF

16 HOURS OF SYSTEM ADMINISTATOR TRAINING PERFORMED BY AN IR CERTIFIED FACTORY TRAINED INSTRUCTOR.

Heading 003-AL

1 PR DOOR 101-A ALTER # 6 EXTERIOR ENTRY / LOBBY ENTTRANCE 101 5'6" x 7'0" x 1-3/4" x WD x WF x NON-RTD

Opening Remark: ALTERNATE # 6 ELECTRONIC ACCESS CONTROL

5DD1 4 5 W 4 5 NDD

Each Assembly to have:

5	EA	HINGE	5BB1 4.5 X 4.5 NRP	605	IVE	
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW4	605	IVE	
1	EA	PANIC HARDWARE	5547WDC X E371WDC-L-ENGINEERING SPECIAL	605	VON	
1	EA	PANIC HARDWARE	5547WDC-L	605	VON	
2	EA	WOOD TRIM KIT	#10 WDA KIT	605	VON	
1	EA	CONSTRUCTION CORE	23-030-ICX	626	SCH	
1	EA	MORTISE CYLINDER	30-008	605	SCH	
1	SET	ASTRAGAL	140PA-B	668	NGP	
2	EA	SURFACE CLOSER	1461 CUSH FC	696	LCN	
2	EA	KICK PLATE	8400 10" X 1" LDW	605	IVE	
2	EA	JAMB SEALS	600A-DKB	710	NGP	
1	EA	HEAD SEAL	706A-DKB	710	NGP	
1	EA	THRESHOLD	613 OR PER DETAIL MS&A	AL	NGP	
1	EA	POWER SUPPLY	PS902		SCE	
2	EA	DOOR POSITION	679-05 WD		SCE	
		SWITCH				
1	EA	READER INTERFACE	SBB-RI	600	SCE	
1	EA	PROXIMITY READER	SXF1050	BLK	SCE	
	THE HADDWADE GET IG FOR ALTERNATE DID # C DOOD 101 FLECTRIONIC ACCEGG CONTROL					

THIS HARDWARE SET IS FOR ALTERNATE BID # 6, DOOR 101, ELECTRIONIC ACCESS CONTROL. THE ELECTRONIC ACCESS CONTROL TO INTEGRATE INTO THE EXISTING SCHLAGE BRIGHT BLUE SOFTWARE/SYSTEM.

LOCATION OF PROXIMITY READER PER PLANS.

LOCATION OF POWER SUPPLY PER PLANS.

LOCATION OF READER INTERFACE PER PLANS.

C05

Heading 004

		Heading 004				
	1 SGL DOOR501-AROOF / STAIR					
	2'9" x 6'8" x 1-3/4" x WD x WDF x NON-RTD					
	Each Assembly to have:					
1	EA CONTINUOUS HINGE	224HD	313	IVE		
1	EA CLASSROOM LOCK	L9071R 17A	613	SCH		
2	EA CONSTRUCTION COR		626	SCH		
1	EA SURFACE CLOSER	1461 CUSH FC	695	LCN		
1	EA DRIP CAP	16DKB	710	NGP		
2	EA JAMB SEALS	600A-DKB	710	NGP		
1	EA DOOR SWEEP/DRIP	618-DKB	710	NGP		
1	EA HEAD SEAL	706A-DKB	710	NGP		
1	EA THRESHOLD	613 OR PER DETAIL MS&A	AL	NGP		
		Heading 005				
	1 SGL DOOR216-AC	ORRIDOR / UNIT 216				
		ORRIDOR / UNIT 254				
		ORRIDOR / UNIT 316				
		ORRIDOR / UNIT 354				
		ORRIDOR / UNIT 416				
		ORRIDOR / UNIT 454				
		x 6'8" x 1-3/4" x XWDD x XWDF x NON-RTD				
	Each Assembly to have:					
1	EA ENTRANCE LOCK	S210RD NEP	613	SCH		
1	EA CONSTRUCTION COR	E 23-030-ICX	626	SCH		
1	EA DOOR REINFORCE	264 MAG SECURITY PREP PLATE	666	MAG		
	DUTCHMAN EXISTING STR	IKE CUTOUTS.				
		Heading 006				
	1 SGL DOOR 204-AH	ALLWAY / ACCESSIBLE UNIT 204				
		x 6'8" x 1-3/4" x WD x WDF x NON-RTD				
	Each Assembly to have:	X 0 8 X 1-3/4 X W D X W D I X NON-K I D				
2	EA HINGE	SDD1 4 S V 4 NDD	<i>c</i> 40	IVE		
3		5BB1 4.5 X 4 NRP	640	IVE		
1	EA ENTRANCE LOCK	S210RD NEP	613	SCH		
1	EA CONSTRUCTION COR		626	SCH		
1	EA WALL STOP	WS407CCV	613	IVE		
3	EA SILENCER	SR65	GRY	IVE		
		Heading 007				
	1 PR DOOR 203-C U	NIT 203 / CLOSET 203C				
		NIT 204 / CLOSET 204C				
		ES x 6'8" x 1-3/4" x WD x GWB x NON-RTD				
	Each Assembly to have:	20 H C C H T S/ I W II D K C II D K I I C I K I D				
1	SET BI-PASSING TRACK	9885	628	HAG		
2	EA FLUSH PULL	227	613	IVE		
2	EA FLUSH FULL	<i>441</i>	013	IVE		

	1 SGL DOOR204-BUN 1 SGL DOOR216-BUN 1 SGL DOOR254-BUN 1 SGL DOOR316-BUN 1 SGL DOOR354-BUN 1 SGL DOOR416-BUN 1 SGL DOOR454-BUN 3'0" x	Heading 008 IT 203 / TOILET 203B IT 204 / TOILET 204B IT 216 / TOILET 216B IT 254 / TOILET 254B IT 316 / TOILET 316B IT 354 / TOILET 354B IT 416 / TOILET 454B IT 454 / TOILET 454B		
3 1 1 1 3 1	Each Assembly to have: EA HINGE EA PRIVACY EA KICK PLATE EA DOOR STOP EA SILENCER EA CLOTHS HOOK	5BB1 4.5 X 4 NRP AL44S NEP 8400 10" X 2" LDW 061 SR64 405	640 613 613 640 GRY 640	IVE SCH IVE IVE IVE IVE
		Heading 009 EN PALM COURT / HALLWAY x 7'0" x 1-3/4" x WD x WF x NON-RTD		
1 1 1 1 1 1 1 1	EA CLASSROOM LOCK EA CONSTRUCTION CORE EA SURFACE CLOSER EA KICK PLATE EA WALL STOP SET SEALS EA THRESHOLD 1 SGL DOOR015-ARE VARIES x VA 1 SGL DOOR003-ADIN 1 SGL DOOR014-AHA	224HD ND70RD SPA 23-030-ICX 1461 PULL SIDE MOUNT 8400 10" X 1" LDW WS407CCV 600A-DKB HEAD AND JAMBS 613 OR PER DETAIL MS&A Heading 010 SIDENT LAUNDRY 014 / STAFF LAUNDRY 015 RIES x VARIES x XHMD x XHMF x NON-RTD NING/MULTI PURPOSE 001 / STAFF KITCHEN 003 LLWAY 011 / RESIDENT LAUNDRY 014 RIES x VARIES x XWDD x XWDF x NON-RTD EXISTING HARDWARE TO REMAIN	313 613 626 695 613 613 710 AL	IVE SCH SCH LCN IVE IVE NGP NGP
	3'0" 2	Heading 011 LLWAY 010 / VESTIBULE x 7'0" x 1-3/4" x HMD x HMF x RATED		
3 1 1 1 1 1 1	Each Assembly to have: EA HINGE EA CLASSROOM LOCK EA CONSTRUCTION CORE EA SURFACE CLOSER EA KICK PLATE EA WALL STOP SET SEALS EA THRESHOLD	5BB1 4.5 X 4 NRP ND70RD SPA 23-030-ICX 1461 PUSH SIDE MOUNT 8400 10" X 2" LDW WS407CCV 5050CL HEAD AND JAMBS 613 OR PER DETAIL MS&A	640 613 626 695 613 613 CLR AL	IVE SCH SCH LCN IVE IVE NGP NGP

Heading 012

1 SGL DOOR004-A STAFF KITCHEN 003 / STAFF STORAGE 004 3'0" x 7'0" x 1-3/4" x WD x WDF x NON-RTD

Each Assembly to have:

3	EA	HINGE	5BB1 4.5 X 4 NRP	640	IVE
1	EA	CLASSROOM LOCK	ND70RD SPA	613	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW	613	IVE
1	EA	WALL STOP	WS407CCV	613	IVE
3	EA	SILENCER	SR64	GRY	IVE

Heading 013 NOT USED

Heading 014

1 SGL DOOR012-B EXISTING STORAGE / RESIDENT LOCKER STORAGE 012 3'0" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

Each Assembly to have:

3	EA	HINGE	5BB1 4.5 X 4 NRP	640	IVE
1	EA	CLASSROOM LOCK	ND70RD SPA	613	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX	626	SCH
1	EA	SURFACE CLOSER	1461 HCUSH FC	695	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	613	IVE
3	EA	SILENCER	SR64	GRY	IVE

Heading 015

1 SGL DOOR012-AHALLWAY 011 / RESIDENT LOCKER STORAGE 012 3'0" x 7'0" x 1-3/4" x XHMD x XHMF x NON-RTD

Each Assembly to have:

3	EA	FILLER PLATES	1192 HINGE FILLER PLATES	600	STE
1	EA	FILLER PLATE	1194/95 STRIKE FILLER PLATE	600	STE
1	EA	CONTINUOUS HINGE	157HD	313	IVE
1	EA	CLASSROOM LOCK	ND70RD SPA	613	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX	626	SCH
1	EA	DOOR REINFORCE	4-BN-2 MAG SECURITY PREP PLATE	666	MAG
1	EA	SURFACE CLOSER	1461 HCUSH FC	695	LCN
3	EA	SILENCER	SR66	GRY	IVE

BALANCE OF HARDWAR TO REMAIN

REVERSE DOOR FROM LHR TO RHR.

PREP FRAME FOR THE STRIKE OF REVERSING THE DOOR HAND.

Heading 016

1 PR DOOR008-AHALLWAY 011 / ACTIVITY ROOM 008 6'0" x 7'0" x 1-3/4" x WD x WDF x NON-RTD

	Each	Assembly to have:			
6	EA	HINGE	5BB1 4.5 X 4 NRP	640	IVE
1	EA	MANUAL FLUSH BOLT	FB457 (TOP)	613	IVE
1	EA	CLASSROOM LOCK	ND70RD SPA	613	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX	626	SCH
2	EA	SURFACE CLOSER	1461 HCUSH FC	695	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW	613	IVE
2	EA	SILENCER	SR64	GRY	IVE
	STRA	IGHT STRIKE LIP OF 7/8	INCH		

Heading 017

1 PR DOOR006-ADINING/MULTI PURPOSE 001 / STORAGE 006

Each Assembly to have:

6	EA	HINGE	5BB1 4.5 X 4 NRP	640	IVE
1	EA	MANUAL FLUSH BOLT	FB457 (TOP)	613	IVE
1	EA	CLASSROOM LOCK	ND70RD SPA	613	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX	626	SCH
2	EA	OVERHEAD HOLDER	454H	613	GLY
2	EA	KICK PLATE	8400 10" X 1" LDW	613	IVE
2	EA	SILENCER	SR64	GRY	IVE
	STRA	IGHT STRIKE LIP OF 7/8	INCH		

Heading 018

1 SGL DOOR106-AHALLWAY 107 / COMPUTER TECHNOLOGY 106 $3\!\!\:^{\circ}\!\!\:^{\circ}$ x 7'0" x 1-3/4" x WD x WDF x NON-RTD

Each Assembly to have:

3	EA	HINGE	5BB1 4.5 X 4 NRP	640	IVE
1	EA	CLASSROOM LOCK	ND70RD SPA	613	SCH
1	EA	CONSTRUCTION CORE	23-030-ICX	626	SCH
1	EA	SURFACE CLOSER	1461 HCUSH FC	695	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	613	IVE
3	EA	SILENCER	SR64	GRY	IVE

END OF SECTION

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Low Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California

Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. American Gypsum.
 - 2. Georgia-Pacific Gypsum LLC.
 - 3. National Gypsum Company.
 - 4. USG Corporation.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch (15.9 mm).
 - 2. Long Edges: Tapered.
- C. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Core: 5/8 inch (15.9 mm), Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
 - 2. Shapes:
 - a. Cornerbead.
 - b. L-Bead: L-shaped; exposed long flange receives joint compound.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

- 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
- 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
- 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
- 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.

- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Wallboard Type: As indicated on Drawings.
 - 2. Type X: Vertical surfaces unless otherwise indicated.
 - 3. Moisture- and Mold-Resistant Type: As indicated on Drawings.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 - 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:

- 1. Cornerbead: Use at outside corners unless otherwise indicated.
- 2. L-Bead: Use where indicated.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 09 Sections.

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceilings.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturers technical data for each type of acoustical ceiling unit and suspension system required.
- B. Samples: Minimum 6-inch x 6-inch samples of specified acoustical panel; 8-inch long samples of exposed wall moldings and suspension system, including main runner and cross tees.
- C. Shop drawings: Layout and details of acoustical ceilings. Show locations of items which are to be coordinated with, or supported by ceiling.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 - 2. Smoke-Developed Index: 50 or less.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations:

- 1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
- 2. Suspension System: Obtain each type from single source from single manufacturer.
- B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.
- C. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- D. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.
- E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS AC-1

- A. Manufacturers: Subject to compliance with requirements, provide the following or approved equal:
 - 1. Armstrong World Industries, Inc. Dune 1850.

- B. Classification: Provide fire-resistance-rated panels complying with ASTM E 1264 for type, form, and pattern as follows:
 - 1. Composition: Mineral Fiber
 - 2. Surface Texture: Fine
- C. Color: White.
- D. LR: Not less than 0.80.
- E. NRC: Not less than 0.50.
- F. CAC: Not less than 35.
- G. Edge/Joint Detail: Square Lay-In.
- H. Thickness: 5/8 inch (15 mm).
- I. Modular Size: 24 by 24 inches (610 by 610 mm).
- J. Antimicrobial Protection: Resistance against the growth of mold/mildew and gram positive and gram negative odoer and stain causing bacteria.

2.4 METAL SUSPENSION SYSTEM AC-1

- A. Manufacturers: Subject to compliance with requirements, provide the following or approved equal:
 - 1. Armstrong World Industries, Inc. Prelude XL Fire Guard 15/16" Exposed Tee System
- B. Wide-Face, Capped, Double-Web, Fire-Rated, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
 - 1. Structural Classification: Heavy-duty system.
 - 2. End Condition of Cross Runners: Override (stepped) or butt-edge] type.
 - 3. Face Design: Flat, flush.
 - 4. Cap Material: Steel cold-rolled sheet.
 - 5. Cap Finish: Painted white.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
 - 1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 - 6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - 7. Do not attach hangers to steel deck tabs.
 - 8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 9. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
 - 10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

- 1. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
- 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. Arrange directionally patterned acoustical panels as follows:
 - a. As indicated on reflected ceiling plans.
 - b. Install panels with pattern running in one direction parallel to [long] [short] axis of space.
 - c. Install panels in a basket-weave pattern.
 - 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 - 3. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 - 4. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
 - 5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
 - 6. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 FIELD QUALITY CONTROL

A. Suspended ceiling shall be subject to code required special inspections and procedures.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspensionsystem members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Vinyl sheet floor covering, without backing.

B. Related Sections:

- 1. Division 09 Section "Resilient Base and Accessories" for resilient base, reducer strips, and other accessories installed with resilient floor coverings.
- 2. Division 09 Section "Linoleum Flooring" for linoleum sheet floor coverings.
- 3. Division 09 Section "Resilient Tile Flooring" for resilient floor tile.
- 4. Division 09 Section "Static-Control Resilient Flooring" for resilient floor coverings designed to control electrostatic discharge.
- 5. Division 09 Section "Resilient Athletic Flooring" for resilient floor coverings for use in athletic-activity or support areas.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: In manufacturer's standard size, but not less than 6-by-9-inch (150-by-230-mm) sections of each different color and pattern of floor covering required.
 - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches (230 mm) long, of each color required.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor covering installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor covering manufacturer for installation techniques required.
- B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store floor coverings and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store rolls upright.

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive floor coverings during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install floor coverings after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL FLOOR COVERING - RSF-1

A. Products: Refer to the Finish Schedule in the drawings.

2.2 VINYLFLOOR COVERING - RSF-2

A. Products: Refer to the Finish Schedule in the drawings.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor covering and substrate conditions indicated.
- C. Integral-Flash-Cove-Base Accessories:
 - 1. Cove Strip: 1-inch (25-mm) radius provided or approved by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor coverings.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of floor coverings.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor coverings until they are same temperature as space where they are to be installed.
 - 1. Move floor coverings and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation.

3.3 FLOOR COVERING INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor coverings.
- B. Unroll floor coverings and allow them to stabilize before cutting and fitting.
- C. Lay out floor coverings as follows:
 - 1. Maintain uniformity of floor covering direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in floor covering substrates.
 - 3. Match edges of floor coverings for color shading at seams.
 - 4. Avoid cross seams.
- D. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.

- F. Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor coverings on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of floor coverings installed on covers and adjoining floor covering. Tightly adhere floor covering edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Integral-Flash-Cove Base: Cove floor coverings 6 inches (152 mm) up vertical surfaces. Support floor coverings at horizontal and vertical junction by cove strip. Butt at top against cap strip.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor coverings.
- B. Perform the following operations immediately after completing floor covering installation:
 - 1. Remove adhesive and other blemishes from floor covering surfaces.
 - 2. Sweep and vacuum floor coverings thoroughly.
 - 3. Damp-mop floor coverings to remove marks and soil.
- C. Protect floor coverings from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover floor coverings until Substantial Completion.

END OF SECTION 096516

SECTION 09900 - PAINTING AND COATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Interior and exterior paint and coatings systems including: paint, stains, transparent coatings, and opaque finishes. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.2 RELATED SECTIONS

- A. Section 012500 Substitution Procedures
- B. Section 013300 Submittal Procedures
- C. Section 030130 Maintenance of Cast-In-Place Concrete (for Sidewalk Repair)
- D. Section 080152.93 Historic Treatment of Wood Windows
- E. Section 081433 Custom Stile and Rail Wood Doors
- F. Section 092900 Gypsum Board

1.3 REFERENCES

- A. SSPC-SP 1 Solvent Cleaning
- B. SSPC-SP 2 Hand Tool Cleaning
- C. SSPC-SP 3 Power Tool Cleaning
- D. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete
- E. EPA-Method 24
- F. SCAQMD Rule1113 -7/01/2008

1.4 SUBMITTALS

- A. Submit under provisions of Section 013300 Submittal Procedures.
- B. Product Data: Manufacturer's data sheets on each paint and coating product should include:
 - 1. Product characteristics
 - 2. Surface preparation instructions and recommendations
 - 3. Primer requirements and finish specification
 - 4. Storage and handling requirements and recommendations
 - 5. Application methods
 - 6. Cautions
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufactures color samples available.

- D. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.
- E. Submit SCAQMD compliant products only.

1.5 MOCK-UP

Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of painting on the project.

- A. Finish surfaces for verification of products, colors, & sheens
- B. Finish area designated by Architect
- C. Provide samples that designate prime & finish coats
- D. Do not proceed with remaining work until the Architect approves the mock-up samples

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacture's name, label, and the following list of information:

Product name, and type (description)
Application & use instructions
Surface preparation
VOC content
Environmental issues
Batch date

- Color number
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials in an area that is within the acceptable temperature range, per manufacturers instructions. Protect from freezing.
- D. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

1.7 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Specified Manufacturer: Products of the Sherwin-Williams Company are the basis of design products specified to establish the level of quality.

B. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 012500 –Substitution Procedures. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2.2 MATERIALS - GENERAL REQUIREMENTS

A. Paints and Coatings - General:

- Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct
 consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or
 dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- 2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
- 3. VOC's. The VOC concentrations of the product shall not exceed the current rules in effect for the South Coast Air Quality Management District (SCAQMD). The calculation of VOC shall exclude water and tinting color added at the point of sale.

B. Primers:

1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

2.3 ACCESSORIES

A. Coating Application Accessories:

1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

2.4 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure;
 - 1. Moisture Testing Prior to applying paint or coatings, the Contractor shall provide moisture testing to confirm the moisture content in the substrate does not exceed the maximum moisture content recommended by the paint or coating manufacturer. The contractor will test two locations on each side of the building and provide a letter to the Owner certifying the surfaces are within allowed limits.
 - 2. Testing for pH Level Prior to applying paint or coatings, the Contractor shall provide pH testing to confirm the level of pH to be at or below 13 and not to exceed the maximum level as recommended by the paint or coating manufacturer. The contractor will test two locations on each side of the building and provide a letter to the Owner certifying the surfaces are within allowed limits.
 - 3. Dry Film Testing Following painting, the Contractor shall provide dry-film testing to a minimum of 4 locations on each elevation and provide a letter to the Owner certifying the paint thickness applied meets the minimum dry-film thickness recommended by the paint manufacturer. The Contractor shall provide coatings as required to achieve the required thickness.
 - a. The first test is paid by the Owner.
 - b. Remedial testing is paid by the Contractor.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

3.2 SURFACE PREPARATION

- A. Proper product selection, surface preparation and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces.
- B. The surface must be dry and in sound condition. Remove all oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
- C. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
- D. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F unless the specified product is designed for the marginal conditions.

E. Methods

1. Previously Painted Concrete and Cement Plaster

Remove all surface contamination by high pressure washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped, sanded, and removed to a sound surface. Pressure wash with a minimum of 2100 psi pressure to remove all dirt, dust, grease, oil, chalk, loose particles, laitance, foreign material, and peeling or defective coatings. Allow the surface to dry thoroughly. Patch all cracks up to 1/16" in width with ConSeal Sealant or Patch. Open to a sound surface all cracks in excess of 1/16" in width and prime then patch with ConSeal Sealant or Patch. Spot prime all patched areas and apply a full prime coat to all new concrete / plaster surfaces prior to painting.

2. Previously Painted Ferrous and Non-Ferrous Metal Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1, using a biodegradeable cleaner. Hand tool and / or

3. Previously Painted Wood

Existing peeling paint should be scraped, sanded, and removed to a sound surface. Intact paint in good condition must be sanded to a dull finish to promote adhesion of new paint. All surfaces must be clean and dry. Spot prime all patches and repairs prior to painting using wood filler or putty and sand smooth.

- 4. Previously Painted Drywall
 - Existing peeling paint should be scraped, sanded, and removed to a sound surface. Patch and repair or replace all damaged and deteriorated drywall areas. Spot prime all patched areas and apply a full prime coat to all new drywall surfaces prior to painting. All surfaces must be clean and dry.
- A. Apply all coatings and materials per manufacture specifications. Mix and thin coatings according to manufacture recommendation.

- B. Do not apply to wet or damp surfaces.
 - 1. Wait at least 30 days before applying to new concrete. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days.
 - 2. Test new concrete for moisture content.
 - 3. Wait until wood is fully dry after rain, fog or dew.
- C. Apply coatings using methods recommended by manufacturer.
- D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
- E. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness and recommended by the manufacturer.
- F. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
- G. Inspection: The coated surface must be inspected and approved by the Architect or Engineer just prior to each coat.

3.4 PROTECTION

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

3.5 EXTERIOR SCHEDULE

- A. PREVIOUSLY PAINTED CONCRETE, CEMENT PLASTER
 - 1. Latex System Vertical Surfaces
 - a. Flat Finish

Spot Prime: S-W Loxon Primer A24W300 One Coat: S-W A-100 Exterior Latex Flat, A6 Series

b. Satin Finish

Spot Prime: S-W Loxon Primer A24W300

One Coat: S-W A-100 Exterior Latex Satin, A82 Series

2. Latex System – Horizontal Surfaces (parapet caps, architectural details)

Spot Prime: S-W Loxon Primer A24W300

1st Coat: S-W SherCrete Flexible Concrete Waterproofer A5 Series 2nd Coat: S-W SherCrete Flexible Concrete Waterproofer A5 Series

- B. MISCELLANEOUS PREVIOUSLY PAINTED FERROUS AND NON-FERROUS METALS (Railings, Ladders, Flashings, Miscellaneous)
 - 1. Alkyd System
 - a. Gloss Finish

Spot Prime: S-W Controls Rust Primer B49WJ900 One Coat: S-W Controls Rust Gloss B35WJ951

C. PREVIOUSLY PAINTED WOOD- (Doors, Trims, Window Frames, Miscellaneous)

- 1. Latex System
 - a. Semi-Gloss Finish

Spot Prime: S-W PrepRite ProBlock Latex Primer, B51 Series One Coat: S-W Solo Acrylic Semi-Gloss, B31WJ8651

3.6 INTERIOR SCHEDULE

A. PREVIOUSLY PAINTED CEMENT PLASTER (Walls and Ceilings)

- 1. Latex System
 - a. Eggshell Finish

Spot Prime: S-W PrepRite ProBlock Latex Primer, B51 Series One Coat: S-W ProMar 400 Western Eg-shel B20WJ0471

B. PREVIOUSLY PAINTED DRYWALL (Walls and Ceilings)

- 1. Latex System
 - a. Flat Finish

Spot Prime: S-W PrepRite High Build Latex Primer, B28W601 One Coat: S-W ProMar 400 Western Eg-shel B20WJ0471

C. MICELLANEOUS PREVIOUSLY PAINTED FERROUS AND NON-FERROUS METALS - (Interior Miscellaneous Plates, Grills, Hardware)

- 1. Latex System
 - a. Eggshell Finish

Spot Prime: S-W Pro Industrial Pro-Cryl Primer, B66-310 Series One Coat: S-W ProMar 400 Western Eg-shel B20WJ0471

D. PREVIOUSLY PAINTED WOOD- (Doors, Trims, Frames, Railings, miscellaneous)

- 1. Latex System
 - a. Semi-Gloss Finish

Full Prime Coat: S-W PrepRite ProBlock Latex Primer, B51 Series

One Coat: S-W Solo Acrylic Semi-Gloss, B31WJ8651

END OF SECTION

SECTION 101423 - PANEL SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Room-identification signs.
 - 2. Accessibility signs.
 - 3. Exit signs.

1.3 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
 - 1. Include representative Samples of available typestyles and graphic symbols.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 SIGNS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Advance Corporation; Braille-Tac Division.
 - 2. ASE, Inc.

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- 3. Best Sign Systems Inc.
- 4. Bunting Graphics, Inc.
- 5. InPro Corporation.
- 6. Mohawk Sign Systems.
- 7. Seton Identification Products.
- 8. Vomar Products, Inc.
- B. Room-Identification Signs: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
 - 1. Basis-of-Design Product: Indicated on Drawings.
 - 2. Sign-Panel Perimeter: Finish edges smooth.
 - a. Edge Condition: Square cut.
 - b. Corner Condition in Elevation: Square.
 - 3. Mounting: Surface mounted to wall or door with countersunk flathead through fasteners.
 - 4. Text and Typeface: Accessible raised characters and Braille, typeface as selected by Architect from manufacturer's full range. Finish raised characters to contrast with background color, and finish Braille to match background color.

2.2 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:
 - 1. Sign Mounting Fasteners:
 - Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, installed in predrilled holes.

2.3 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 - 1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 - 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 - 3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 - 4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 - 5. Internally brace signs for stability and for securing fasteners.
 - 6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

2.4 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. Mounting Methods:

1. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Private-use bathroom accessories.
- 2. Underlayatory guards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.

1.4 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.5 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 PRIVATE-USE BATHROOM ACCESSORIES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Basco, Inc.
 - 2. Bobrick Washroom Equipment, Inc.
 - 3. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 - 4. Tubular Specialties Manufacturing, Inc.
- B. Toilet Tissue Dispenser:
 - 1. Basis-of-Design Product: Bobrick B-6857.
 - 2. Description: Single-roll dispenser.
 - 3. Mounting: Surface mounted.
 - 4. Capacity: Designed for 4-1/2- or 5-inch- (114- or 127-mm-) diameter tissue rolls.
 - 5. Material and Finish: Stainless steel, No. 4 finish (satin).
- C. Medicine Cabinet:
 - 1. Basis-of-Design Product: Bobrick B-297
 - 2. Mounting: Surface mounted.
 - 3. Size: 14 by 20 inches (460 by 610 mm).
 - 4. Door: Framed mirror door concealing storage cabinet equipped with continuous hinge and spring-buffered, rod-type stop and magnetic door catch.
 - 5. Shelves: Two fixed.
 - 6. Material and Finish:
 - a. Cabinet: Steel with baked enamel finish.
 - b. Mirror Frame: Stainless steel.
 - 7. Cabinet may be inverted for right-hand or left-hand installation, Contractor to field verify prior to installations.
- D. Towel Bar 18-inch:
 - 1. Basis-of-Design Product: Gamco 76747X18.
 - 2. Description: 3/4-inch- (19-mm-) round tube with rectangular end brackets.
 - 3. Mounting: Flanges with concealed fasteners.
 - 4. Length: 18 inches (457 mm).
 - 5. Material and Finish: Stainless steel, No. 4 finish (satin).
- E. Towel Bar 24-inch:
 - 1. Basis-of-Design Product: Gamco 76747X24.
 - 2. Description: 3/4-inch- (19-mm-) round tube with rectangular end brackets.
 - 3. Mounting: Flanges with concealed fasteners.
 - 4. Length: 24 inches (610 mm).
 - 5. Material and Finish: Stainless steel, No. 4 finish (satin).
- F. Tub/Shower Grab Bars (to be installed at all residential rooms with tubs, 62 total):
 - 1. Basis-of-Design Product: Tubular Specialties Mfg. TSM 2040V.
 - 2. Description: Horizontal Corner Bar with Vertical Arm.
 - 3. Mounting: Flanges with concealed fasteners.
 - 4. Material and Finish: Stainless steel, No. 4 finish (satin).
 - 5. Contractor to field verify right-hand vs. left-hand quantity prior to purchase.

2.2 UNDERLAVATORY GUARDS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Truebro by IPS Corporation.
- B. Underlavatory Guards Shall be provided at all wall-mounted lavatories in ADA-compliant guest rooms and public toilet rooms.
 - 1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
 - 2. Material and Finish: Antimicrobial, molded plastic, white.

2.3 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 113100 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Cooking appliances.
- 2. Refrigeration appliances.
- 3. Cleaning appliances.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, dimensions, furnished accessories, and finishes for each appliance.
- B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.
- C. Product Schedule: For appliances. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of appliance, from manufacturer.
- B. Warranties: Sample of special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain each type of residential appliance from single manufacturer.
- C. Regulatory Requirements: Comply with the following:

- 1. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 2. ANSI: Provide gas-burning appliances that comply with ANSI Z21 Series standards.
- D. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1

1.7 WARRANTY

- A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Electric Range: Full warranty including parts and labor for on-site service on surface-burner elements.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- C. Microwave Oven: Full warranty including parts and labor for on-site service.
 - 1. Warranty Period: Two years from date of Substantial Completion. Refrigerator/Freezer Icemaker, Sealed System: Full warranty including parts and labor for on-site service on the product.
- D. Dishwasher: Full warranty including parts and labor for on-site service on the product.
 - 1. Warranty Period for Deterioration of Tub and Metal Door Liner: Five years from date of Substantial Completion.
 - 2. Warranty Period for Other Components: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 RANGES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
 - 1. BOSCH Home Appliances.
 - 2. Electrolux Home Products (Frigidaire).
 - 3. General Electric Company (GE).
 - 4. KitchenAid; a division of Whirlpool Corporation.
 - 5. LG Appliances.
 - 6. Sears Brands LLC (Kenmore).
 - 7. Whirlpool Corporation.
- C. Electric Range RG #1: Freestanding range with one oven and complying with AHAM ER-1.
 - 1. Basis-of-Design Product: Frigidaire Gallery Series FGEF3042KF.
 - 2. Width: 30 inches (762 mm).

- 3. Electric Burner Elements: Four or Five.
 - Radiant Type: One 1200-W element, dual 1500-W/1500-W bridge element, and one 1200-W/2500-W expandable element.
 - b. Controls: Digital panel controls, located on splash panel at rear of rangetop.
- 4. Oven Features:
 - a. Capacity: 5.7 cu. ft. .
 - b. Operation: Baking, convection, and self-cleaning.
 - c. Broiler: Located in top of oven.
 - d. Oven Door(s): Counterbalanced, removable, with observation window and full-width stainless steel handle.
 - e. Electric Power Rating:
 - 1) Oven(s): Manufacturer's standard.
 - 2) Broiler: Manufacturer's standard.
 - f. Controls: Digital panel controls and timer display, located on splash panel at rear of rangetop.
- 5. Anti-Tip Device: Manufacturer's standard.
- 6. Electric Power Supply: 240 V, 60 Hz, 1 phase, 30 A.
- 7. Material: Stainless steel with ceramic-glass cooktop.

2.2 MICROWAVE OVENS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
 - 1. BOSCH Home Appliances.
 - 2. Electrolux Home Products (Frigidaire).
 - 3. General Electric Company (GE).
 - 4. KitchenAid; a division of Whirlpool Corporation.
 - 5. LG Appliances.
 - 6. Sears Brands LLC (Kenmore).
 - 7. Whirlpool Corporation.
- C. Microwave Oven MO #1:
 - 1. Basis-of-Design Product: GE Profile PEB1590SMSS.
 - 2. Mounting: Built-in.
 - 3. Type: Convection.
 - 4. Dimensions:
 - a. Width: 24 inches (610 mm).
 - b. Depth: 19-1/2 inches (495 mm).
 - c. Height: 14 inches (356 mm).
 - 5. Capacity: 1.5 cu. ft. (0.04 cu. m).
 - 6. Oven Door: Door with observation window and push-button latch release.
 - 7. Microwave Power Rating: 1000 W.

- a. Convection Element Power Rating: Manufacturer's standard.
- 8. Electric Power Supply: 120 V, 60 Hz, 1 phase, 15 A.
- 9. Controls: Digital panel controls and timer display.
- 10. Other Features: Turntable.
- 11. Material: Stainless steel.

2.3 REFRIGERATOR/FREEZERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
 - 1. Electrolux Home Products (Frigidaire).
 - 2. General Electric Company (GE).
 - 3. Jenn-Air; a division of Whirlpool Corporation.
 - 4. KitchenAid; a division of Whirlpool Corporation.
 - 5. LG Appliances.
 - 6. Sears Brands LLC (Kenmore).
 - 7. Whirlpool Corporation.
- C. Refrigerator/Freezer RF #1 Two-door, side-by-side refrigerator/freezer and complying with AHAM HRF-1.
 - 1. Basis-of-Design Product: Kenmore Stainless Steel 26.5 cu. Ft. Side-By-Side Refrigerator 5101.
 - 2. Type: Freestanding.
 - 3. Dimensions:
 - a. Width: 36 inches.b. Depth: 31-3/4 inches.
 - c. Height: 68-3/8 inches.
 - 4. Storage Capacity:
 - a. Refrigeration Compartment Volume: 16.2 cu. ft.
 - b. Freezer Volume: 10.3 cu. ft.
 - c. Shelf Area: Three adjustable glass shelves.
 - 5. General Features:
 - a. Door Configuration: Overlay.
 - b. Dispenser in door for ice and cold water.
 - c. Separate temperature controls for each compartment.
 - 6. Refrigerator Features:
 - a. Interior light in refrigeration compartment.
 - b. Compartment Storage: vegetable crisper and meat compartment.
 - c. Door Storage: Modular compartments.
 - d. Temperature-controlled meat/deli bin.
 - 7. Freezer Features: One freezer compartment with door.

- a. Automatic defrost.
- b. Interior light in freezer compartment.
- c. Automatic icemaker and storage bin.
- 8. Energy Performance, ENERGY STAR: Provide appliances that qualify for the EPA/DOE ENERGY STAR product labeling program.
- 9. Front Panel(s): Stainless steel.
- 10. Appliance Color/Finish: Stainless steel.

2.4 DISHWASHERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
 - 1. BOSCH Home Appliances.
 - 2. Electrolux Home Products (Frigidaire).
 - 3. General Electric Company (GE).
 - 4. KitchenAid; a division of Whirlpool Corporation.
 - 5. Sears Brands LLC (Kenmore).
- C. Dishwasher DW #1: Complying with AHAM DW-1 and ASSE 1006.
 - 1. Basis-of-Design Product: GE GDWF100R.
 - 2. Type: Built-in undercounter.
 - 3. Dimensions:
 - a. Width: 24 inches.
 - b. Depth: 25 inches.
 - c. Height: 34 inches.
 - 4. Capacity:
 - a. International Place Settings of China: 14.
 - b. Water Consumption for Full Load: 3.2 gal. (12 L) per cycle.
 - Tub and Door Liner: Stainless steel interior with sealed detergent and automatic rinsing-aid dispensers.
 - 6. Rack System: Nylon-coated sliding dish racks, with removable cutlery basket.
 - 7. Controls: Touch-pad controls with four wash cycles and hot-air and heat-off drying cycle options.
 - 8. Features:
 - a. Waste food disposer.
 - b. Self-cleaning food-filter system.
 - c. Hot-water booster heater for 140 deg F (60 deg C) wash water with incoming water at 100 deg F (38 deg C).
 - d. Lock-out feature.
 - e. Delay-wash option.
 - f. Digital display panel.
 - 9. Energy Performance, ENERGY STAR: Provide appliances that qualify for the EPA/DOE ENERGY STAR product labeling program.
 - 10. Stainless steel.

2.5 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.
- E. Utilities: Comply with plumbing and electrical requirements.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:

- 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
- 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
- 3. Operational Test: After installation, start units to confirm proper operation.
- 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- C. An appliance will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION 113100

SECTION 123200 - MANUFACTURED WOOD CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Plastic-laminate-faced wood cabinets of stock design.
- 2. Plastic-laminate countertops.
- 3. Solid-surfacing-material countertops.
- 4. Wall shelving.

1.3 DEFINITIONS

- A. MDF: Medium-density fiberboard.
- B. Exposed Portions of Cabinets: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches (1220 mm) above floor, and surfaces visible in open cabinets.
- C. Semiexposed Portions of Cabinets: Surfaces behind opaque doors, such as interiors of cabinets, shelves, dividers, interiors and sides of drawers, and interior faces of doors. Tops of cases 78 inches (1980 mm) or more above floor are defined as semiexposed.
- D. Concealed Portions of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, and ends and backs that are placed directly against walls or other cabinets.
- E. Hardwood Plywood: A panel product composed of layers or plies of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive, and faced both front and back with hardwood veneers.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show fabrication details, including types and locations of hardware. Show installation details, including field joints and filler panels. Indicate manufacturer's catalog numbers for casework.
- Samples for Initial Selection: For cabinet finishes and for each type of top material indicated.
- D. Samples for Verification: 8-by-10-inch (200-by-250-mm) Samples for each type of finish, including top material.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Warranty: Sample of special warranty.

1.6 MATERIALS MAINTENANCE SUBMITTALS

A. Furnish complete touchup kit for each type and finish of manufactured wood casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged casework finish.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain manufactured wood casework from single source from single manufacturer.
- B. Product Designations: Drawings indicate sizes, configurations, and finish material of manufactured wood casework by referencing designated manufacturer's catalog numbers. Other manufacturers' casework of similar sizes and door and drawer configurations, of same finish material, and complying with the Specifications may be considered.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver manufactured wood casework only after painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified in "Project Conditions" Article.
- B. Keep finished surfaces covered with polyethylene film or other protective covering during handling and installation.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install manufactured wood casework until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Verify actual dimensions of construction contiguous with manufactured wood casework by field measurements before fabrication.

1.10 COORDINATION

A. Coordinate layout and installation of framing and reinforcements in walls and partitions for support of manufactured wood casework.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of manufactured wood casework that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of components or other failures of glue bond.
 - b. Warping of components.
 - c. Failure of operating hardware.
 - d. Deterioration of finishes.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Plastic-Laminate-Faced Manufactured Casework:
 - a. Aristocraft
 - b. Rosenburg

2.2 MATERIALS, GENERAL

- A. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
- B. Hardwood Plywood: HPVA HP-1, either veneer core or particleboard core unless otherwise indicated.
- C. Softwood Plywood: DOC PS 1.
- D. Particleboard: ANSI A208.1, Grade M-2.
- E. Particleboard: Straw-based particleboard complying with ANSI A208.1, Grade M-2, except for density.
- F. MDF: ANSI A208.2, Grade 130.
- G. Hardboard: AHA A135.4, Class 1 Tempered.
- H. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
 - a. Nevamar Company, LLC; Decorative Products Div.
- I. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- J. Edgebanding for Plastic Laminate: Plastic laminate matching adjacent surfaces.

- K. Edgebanding for Wood-Veneered Construction: Minimum 1/8-inch- (3-mm-) thick, solid wood of same species as face veneer.
 - 1. Select wood edgebanding for grain and color compatible with face veneers.
- L. Edgebanding for Thermoset Decorative Panels: PVC or polyester edge banding complying with LMA EDG-1 and matching thermoset decorative panels.
- M. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
 - a. Caesar Stone

2.3 CABINET MATERIALS

- A. Exposed Cabinet Materials:
 - 1. Wood Species: Alder.
 - 2. Plywood: Hardwood plywood with face veneer of species indicated, selected for compatible color and grain. Grade A exposed faces at least 1/50 inch (0.5 mm) thick, and Grade J crossbands. Provide backs of same species as faces.
 - 3. Solid Wood: Clear hardwood lumber of species indicated, selected for compatible grain and color.
 - 4. Plastic Laminate: Grade HGS.
 - 5. Unless otherwise indicated, provide specified edgebanding on all exposed edges.
- B. Semiexposed Cabinet Materials:
 - 1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed wood.
 - 2. Plywood: Hardwood plywood of same species as exposed wood. Grade B faces and Grade J crossbands. Provide backs of same species as faces.
 - 3. Thermoset Decorative Panels: Provide thermoset decorative panels for semiexposed surfaces unless otherwise indicated.
 - 4. Unless otherwise indicated, provide specified edgebanding on all semiexposed edges.
- C. Concealed Cabinet Materials:
 - 1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
 - 2. Plywood: Hardwood plywood. Provide backs of same species as faces.
 - 3. Plastic Laminate: Grade BKL.

2.4 DESIGN, COLOR, AND FINISH

- A. Design: Provide manufactured wood casework as indicated in the drawings.
- B. Wood Colors and Finishes: As indicated by manufacturer's designation.
- C. Thermoset Decorative Panel Colors, Patterns, and Finishes: As indicated by manufacturer's designations.
- D. Plastic-Laminate Colors, Patterns, and Finishes: As indicated by manufacturer's designations.
- E. Solid-Surfacing Material Colors and Patterns: As indicated by manufacturer's designations.

2.5 CABINET FABRICATION

- A. Wood-Faced Cabinet Construction: As required by referenced quality standard, but not less than the following:
 - 1. Bottoms of Cabinets and Tops of Wall Cabinets: 3/4-inch (19-mm) hardwood plywood.
 - 2. Ends of Cabinets: 3/4-inch (19-mm) hardwood plywood.
 - 3. Shelves: 3/4-inch (19-mm) veneer-core hardwood plywood.
 - 4. Base Cabinet Stretchers: 3/4-by-4-1/2-inch (19-by-114-mm) plywood, particleboard, or MDF strips or solid-wood boards at front and back of cabinet, glued and pinned or screwed.
 - 5. Backs of Cabinets: 3/4-inch (19-mm) particleboard-core hardwood plywood where exposed, 1/2-inch (12.7-mm) hardwood plywood dadoed into sides, bottoms, and tops where not exposed.
 - 6. Drawer Fronts: 3/4-inch (19-mm) particleboard-core hardwood plywood or solid hardwood.
 - 7. Drawer Sides and Backs: 1/2-inch (12.7-mm) solid-wood or hardwood plywood, with glued dovetail or multiple-dowel joints.
 - 8. Drawer Bottoms: 1/4-inch (6.4-mm) veneer-core hardwood plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch (12.7-mm) material for drawers more than 24 inches (600 mm) wide.
 - 9. Doors 48 Inches (1220 mm) or Less in Height: 3/4 inch (19 mm) thick, with solid hardwood stiles and rails, particleboard or MDF cores, and hardwood face veneers and crossbands.
 - 10. Doors More Than 48 Inches (1220 mm) in Height: 1-1/16 inches (27 mm) thick, with solid hardwood stiles and rails, honeycomb cores, and hardwood face veneers and crossbands.
- B. Plastic-Laminate-Faced Cabinet Construction: As required by referenced quality standard, but not less than the following:
 - 1. Bottoms and Ends of Cabinets, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch (19-mm) particleboard, plastic-laminate faced
 - 2. Shelves: 3/4-inch (19-mm) particleboard, plastic-laminate faced on exposed surfaces, thermoset decorative panels on semiexposed surfaces]\.
 - 3. Backs of Cabinets: 1/2-inch (12.7-mm) particleboard, plastic-laminate faced on exposed surfaces, thermoset decorative panels on semiexposed surfaces.
 - 4. Drawer Fronts: 3/4-inch (19-mm) particleboard, plastic-laminate faced.
 - 5. Drawer Sides and Backs: 1/2-inch (12.7-mm) solid-wood or veneer-core hardwood plywood, with glued dovetail or multiple-dowel joints.
 - 6. Drawer Bottoms: 1/4-inch (6.4-mm) hardwood plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch (12.7-mm) material for drawers more than 24 inches (600 mm) wide.
 - 7. Doors: 3/4-inch (19-mm) particleboard or MDF, plastic-laminate faced.
- C. Leg Shoes: Vinyl or rubber, black, open-bottom type.
- D. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

2.6 FINISH FOR WOOD-FACED MANUFACTURED CASEWORK

- A. Preparation: Sand lumber and plywood for manufactured wood casework construction before assembling. Sand edges of doors and drawer fronts and molded shapes with profile-edge sander. Sand casework after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.
- B. Staining: Remove fibers and dust and apply wash-coat sealer and stain to exposed and semiexposed surfaces as required to provide uniform color and to match approved samples.

- C. Finishing Closed-Grain Woods: Apply manufacturer's standard two-coat, baked, clear finish consisting of a thermosetting catalyzed sealer and a thermosetting catalyzed conversion varnish. Sand and wipe clean between applications of sealer and topcoat. Topcoat may be omitted on concealed surfaces.
- D. Finishing Open-Grain Woods: Apply manufacturer's standard three-coat, baked, clear finish consisting of a thermosetting catalyzed sealer and two coats of a thermosetting catalyzed conversion varnish. Sand and wipe clean between applications of sealer and topcoat and between topcoats. Topcoats may be omitted on concealed surfaces.

2.7 CASEWORK HARDWARE AND ACCESSORIES

- A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard, commercial-quality, heavy-duty hardware.
 - 1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, Type B01602, 135 degrees of opening.
- C. Pulls: As indicated by manufacturer's designation in the drawings. Provide 2 pulls for drawers more than 24 inches (600 mm) wide. Refer to drawings and FF&E information in the Appendix for hardware call-out and mounting locations.
- D. First paragraph below can be deleted if self-closing hinges are used. Magnetic catches are less expensive than roller spring catches but are not as effective.
- E. Door Catches: Powder-coated, nylon-roller spring catch or dual, self-aligning, permanent magnet catch. Provide 2 catches on doors more than 48 inches (1220 mm) high.
- F. Drawer Slides: BHMA A156.9, Type B05091.
 - 1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; [full] [full-overtravel]-extension type; zinc-plated, steel ball-bearing slides.
- G. Drawer and Hinged Door Locks: Cylindrical (cam) as indicated by manufacturer's designation
 - 1. Provide a minimum of two keys per lock and six master keys.
 - 2. Provide locks where indicated.
- H. Grommets for Cable Passage through Countertops: As indicated by manufacturers designation.

2.8 COUNTERTOPS

- A. Countertops, General: Provide smooth, clean exposed tops and edges in uniform plane free of defects. Provide front and end overhang of 1 inch (25 mm) over base cabinets.
- B. Plastic-Laminate Tops: Plastic-laminate sheet, shop bonded to both sides of [3/4-inch (19-mm)] [1-1/8-inch (29-mm)] plywood or particleboard. Sand surfaces to which plastic laminate is to be bonded.
 - 1. Plastic Laminate for Flat Tops: Grade HGL.
 - 2. Provide plastic-laminate edgings of the same material as top on front edge of top, on top edges of backsplashes and end splashes, and on ends of tops and splashes.
 - 3. Construct top and backsplash from one piece of plastic laminate with rolled edges and coved intersection. Where indicated, provide separate end splashes fitted to top.

- 4. Use exterior plywood or exterior glue particleboard for countertops containing sinks.
- C. Solid-Surfacing-Material Tops: 3/4-inch- (19-mm-) thick, solid-surfacing material with front edge built up with same material.
 - 1. Front: Straight, slightly eased at top.
 - 2. Backsplashes: 1/2-inch- (12.7-mm-) thick, solid-surfacing material; slightly eased at edge.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of manufactured wood casework.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CASEWORK INSTALLATION

- A. Install level, plumb, and true; shim as required, using concealed shims. Where manufactured wood casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to masonry or framing, wood blocking, or reinforcements in walls and partitions with fasteners spaced 24 inches (600 mm) o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).
 - 1. Where base cabinets are not installed adjacent to walls, fasten to floor at toe space with fasteners spaced 16 inches (400 mm) o.c. Secure sides of cabinets to floor, where they do not adjoin other cabinets, with not less than two fasteners.
- C. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, or framing, blocking, or reinforcements in walls or partitions. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).
 - 1. Fasten through back, near top and bottom, at ends, and not more than 16 inches (400 mm) o.c.
 - 2. Use toggle bolts at hollow masonry.
 - 3. Use expansion anchors at solid masonry.
 - 4. Use No. 10 wafer-head screws sized for 1-inch (25-mm) penetration into wood framing or blocking at wood-framed partitions.
- D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- E. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF TOPS

- A. Field Jointing: Where possible make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
 - 1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- B. Secure tops to cabinets with Z- or L-type fasteners or equivalent, using two or more fasteners at each front, end, and back.
- C. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection.
- D. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and walls with adhesive.
- E. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.4 INSTALLATION OF SHELVING

- A. Securely fasten shelf standards to masonry, partition framing, wood blocking, or reinforcements in partitions.
 - 1. Fasten shelf standards at ends and not more than 12 inches (300 mm) o.c.
 - 2. Use toggle bolts at hollow masonry.
 - 3. Use expansion anchors at solid masonry.
 - 4. Use wood screws sized for 1-inch (25-mm) penetration into wood framing or blocking at wood-framed partitions.
- B. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Space standards not more than 30 inches (750 mm) o.c.
- C. Install shelving level and straight, closely fitted to other work where indicated.

3.5 CLEANING AND PROTECTING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- C. Protection: Provide 6-mil (0.15-mm) plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at a minimum of 48 inches (1220 mm) o.c. Remove protection at Substantial Completion.

END OF SECTION 123200

SECTION 21 13 00 - WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - Replace sprinkler heads in areas where ceilings are to be removed and replaced, as specified in Contract Documents.
 - 2. Under Alternate 2, extend fire sprinkler system to new Resident Storage in basement, as specified in Contract Documents.
- B. Related Sections
 - 1. Section 22 03 00 Common Work Results for Plumbing

1.2 REFERENCES

- A. American Society for Testing And Materials
 - 1. ASTM A 53-90b, "Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless"
 - 2. ASTM A 234-92a, "Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures"
- B. American National Standards Institute/American Society of Mechanical Engineers
 - 1. ANSI/ASME B 16.1-89, "Cast Iron Pipe Flanges and Pipe Flanged Fittings"
 - 2. ANSI/ASME B 16.4-89, "Cast Iron Threaded Fittings, Class 125 and Class 250"
- C. American National Standards Institute/National Fire Protection Association
 - 1. ANSI/NFPA 13-1991, "Installation of Sprinkler Systems"

1.3 SUBMITTALS

- A. See Sections 01 33 00.
- B. Shop Drawings
 - 1. Size sprinkler system by one of following methods
 - a. Pipe schedule method in accordance with ANSI/NFPA 13
 - b. Hydraulic calculation design method based on water supply evaluation performed at building site.
 - 2. Submittal Procedure -

- a. After award of Contract and prior to purchase of equipment, submit seven sets of shop drawings with specifications and hydraulic calculations, if pipe schedule method is not used, to Architect and two sets to local jurisdiction having authority for fire prevention for review.
- b. After integrating Architect's and local jurisdiction's comments into drawings, licensed certified fire protection engineer of record submitting fire sprinkler system design construction documents shall stamp, sign, and date each sheet of shop drawings and first page of specifications and calculations.
- c. Submit stamped documents to area office and local jurisdiction having authority for fire prevention for final approval.
- After final approval, submit four copies of approved stamped documents to Architect.
- e. Failure of system to meet requirements of authority having jurisdiction shall be corrected at no additional cost to Owner.

1.4 QUALITY CONTROL

A. Qualifications

- 1. Designer
 - a. Licensed fire protection engineer certified by NICET to level three minimum and engaged in design of fire protection systems. Engineer shall -
 - 1) Be responsible for overseeing preparation of shop drawings, hydraulic calculations where applicable, and system installation.
 - 2) Make complete inspection of installation.
 - 3) Provide corrected record drawings to Owner with letter of acceptance.
 - 4) Certify that installation is in accordance with Contract Documents.
- 2. Installer Licensed by jurisdiction having authority over installed fire protection systems for location of Project. Furnish verified list of similar projects installed during past five years minimum.

B. Requirements of Regulatory Agencies

- 1. Unless noted otherwise, system shall conform to
 - a. ANSI/NFPA 13 1991 "Light & Ordinary Hazard Occupancies"
 - b. ANSI/NFPA 24 1992 "Service Mains and Their Appurtenances, Private"
 - c. ANSI/NFPA 101 1991 "Life Safety Code"
 - d. Requirements of local water department and local authority having jurisdiction for fire protection.
 - e. Applicable rules, regulations, laws, and ordinances.
 - f. Underwriter's Laboratories Publication, "Fire Protection Equipment Directory",

January 1990.

g. Comply with backflow prevention requirements and, if required, include device in hydraulic calculations.

1.5 MAINTENANCE

A. Extra Materials - Furnish twelve spare heads of each type and temperature rating used, properly boxed with sprinkler head wrench.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Pipe -
 - 1. Above Ground Schedule 40 black welded steel meeting requirements of ASTM A 53.
 - a.. 2 Inches & Smaller Welded, screwed, flanged, or roll grooved coupling system.
 - b. 2-1/2 Inches & Larger Welded, flanged, or roll grooved coupling system.
- B. Fittings -
 - 1. Screwed Cast iron meeting requirements of ANSI B 16.4.
 - 2. Flanged Cast iron meeting requirements of ANSI B 16.1.
 - 3. Welded Carbon steel meeting requirements of ASTM A 234.
 - 4. Roll Grooved Pipe Coupling System
 - a. Gustin Bacon
 - b. ITT Grinnell Coupling
 - c. Victaulic Coupling
- C. Valves
 - 1. Ball Valves
 - a. UL/FM approved
 - b. Valve tamper switch
 - c. Approved Manufacturers & Models -
 - 1) Milwaukee BBSC with threaded ends
 - 2) Nibco T-505 with threaded ends
 - 3) Nibco G-505 with grooved ends
 - 2. Swing Check Valves
 - a. 1/2 to 3 inch horizontal check
 - b. Regrinding type
 - c. Renewable disk
 - d. Bronze Class 125 with threaded ends

- e. Approved Manufacturers & Models -
 - 1) Nibco KT-403-W
 - 2) Walworth Figure 412
- 3. Alarm Check Valves
 - a. Approved Manufacturers & Models -
 - 1) Reliable E with gauges and drain
 - 2) Viking E-1 with gauges and drain
 - 3) Star F with gauges and drain
- 4. Inspector's Test Valve
 - a. Ductile iron body with threaded ends
 - b. Combination sight glass/orifice
 - c. Bronze top works
 - d. Approved Manufacturer & Model -
 - 1) Victaulic Testmaster Alarm Test Module Style 718
- D. Sprinkler Heads
 - 1. Concealed Wet Pendent
 - a. Flush ceiling profile
 - b. Adjustable cover
 - c. UL/FM approved
 - d. Coordinate concealed cover finish with Architect.
 - e. Approved Manufacturers & Models -
 - 1) Reliable G-4 "Adjustable Concealer"
 - 2) Viking Model "Horizon Image"
 - a) Sprinkler Base Part No. 08281
 - b) Cover Assembly Part No. 08310
 - 2. Horizontal Sidewall Sprinkler
 - a. UL/FM approved
 - b. Recess adjustable
 - c. Use Viking A-1 chrome plated sprinkler guard where guards are required.
 - d. Approved Manufacturers & Models -
 - 1) Reliable F-1 with Reliable recessed, 2-piece escutcheon Model GF1
 - 2) Viking M HSW with Viking recessed, 2-piece escutcheon Model E-1
 - 3) Star Model LD-2 with Star Nova Series recessed escutcheon.
 - 3. Pendent & Upright Sprinkler
 - a. UL/FM approved
 - b. Use Reliable C-1 chrome plated sprinkler guard where guards are required.

- c. Use Reliable C flush chrome escutcheon.
- d. Approved Manufacturers & Models -
 - 1) Reliable G
 - 2) Viking M
 - 3) Central A
 - 4) Star E
- 4. Adjustable Drop Nipple
 - a. Steel tube, oxide coated.
 - b. Double o-ring seal.
 - c. 175 psi minimum working pressure.
 - d. Approved Manufacturers & Models -
 - 1) CECA Cold Extrusion Company of America
 - 2) Central "Alpha"

E. Water Flow Alarm

- 1. Mechanical Flow Alarm Water Gong
 - a. UL/FM approved.
 - b. Approved Manufacturers & Models -
 - 1) Reliable C
 - 2) Viking F-1
 - 3) Central F
 - 4) Star CD

F. Pressure Detectors

- 1. Electrical Water Pressure Switch
 - a. UL/FM approved.
 - b. Switch activates on pressure rise between 4-8 psi.
 - c. Two single pole double throw switches.
 - d. Automatic reset.
 - e. Approved Manufacturers & Models -
 - 1) Reliable J54-8295
 - 2) Potter Electric Signal Co PS10

G. Tamper Switch

- 1. Weather & Tamper Resistant Switch
 - a. UL/FM approved.
 - b. Two Single Pole Double Throw Switches.
 - c. Approved Manufacturer & Model -
 - 1) Potter Electric Signal Co PCVS

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install piping per NFPA 13, Paragraph 4-5.1.1.2.
- B. Install system to drain. Drain trapped piping in accordance with NFPA 13, Paragraph 4-5.3.1.
 - 1. Install auxiliary drains in low points of piping system and inspector's test valve drain to mechanical pad located outside building unless otherwise directed by Architect.
- C. Do not use dropped, damaged, or used sprinkler heads.
- D. Install sprinkler lines concealed.
- E. Install tamper switches and pressure flow detectors.
- F. Brace and support system to meet seismic zone requirements for building site.

3.2 FIELD QUALITY CONTROL

A. Site Tests

- 1. Test system according to "Contractor's Material & Testing certificate for Above Ground Piping" NFPA-13, figure 8-1(a).
- 2. Tests shall be witnessed by Architect and representative of local jurisdiction over fire prevention.
- 3. Test blanks shall have red painted lugs protruding beyond flange to clearly indicate their presence and be numbered to assure their removal when testing is completed.

END OF SECTION 21 13 00

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. General piping material requirements and installation procedures applicable to all plumbing systems.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Pipe and Pipe Fittings Use domestic made pipe and pipe fittings on Project. Weld-O-Let and Screw-O-Let fittings are acceptable.
- B. Sleeves
 - 1. In Framing Standard weight galvanized iron pipe, Schedule 40 PVC, or 14 ga galvanized sheet metal two sizes larger than bare pipe or insulation on insulated pipe.
 - 2. In Concrete Sleeves through outside walls, interior shear walls, and footings shall be schedule 80 black steel pipe with welded plate.

2.2 MANUFACTURED UNITS

- A. Valves Valves of same type shall be of same manufacturer.
- B. Pipe Hangers
 - 1. Adjustable, malleable iron clevis type, swivel loop type, or swivel split ring type of a diameter adequate to support pipe size.
 - 2. Approved Manufacturers
 - a. Globe Strut by Globe Pipe Hanger
 - b. B-Line
 - c. Grinnell
 - d. Michigan Hanger
 - e. Superstrut

C. Di-Electric Unions

- 1. Suitable for at least 175 PSIG WP at 250 deg F.
- 2. Approved Manufacturers -

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- a. EPCO
- b. Victaulic
- c. Watts Regulator

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Interface with Other Work
 - Furnish sleeves, inserts, supports, and equipment that are to be installed by others in sufficient time
 to be incorporated into construction as work proceeds. Locate these items and see they are properly
 installed.
- B. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus.
 - 1. Pipe drawings are diagrammatic and indicate general location and connections. Piping may have to be offset, lowered or raised as required or directed at site. This does not relieve this Division from responsibility for proper erection of systems of piping in every respect.
 - 2. Arrange piping to not interfere with removal of other equipment, ducts, or devices, or block access to doors, windows, or access openings.
 - a. Make connections of dissimilar metals with di-electric unions.
 - b. Do not use reducing bushings, street elbows, bull head tees, close nipples or running couplings.
 - c. Install piping systems so they may be easily drained. Provide drain valves at low points and manual air vents at high points in hot water heating and cooling water piping.
 - d. Install piping to insure noiseless circulation.
 - e. Place valves and specialties to permit easy operation and access. Valves shall be regulated, packed, and glands adjusted at completion of work before final acceptance.
 - 3. Do not install piping in shear walls.
- C. Properly support piping and make adequate provisions for expansion, contraction, slope, and anchorage.
 - 1. Cut piping accurately for fabrication to measurements established at site. Remove burr and cutting slag from pipes.
 - 2. Work piping into place without springing or forcing. Make piping connections to pumps and other equipment without strain at piping connection. Remove bolts in flanged connections or disconnect piping to demonstrate that piping has been so connected, if requested.
 - 3. Make changes in direction with proper fittings.
 - 4. Except for underground pipe, suspend piping from roof trusses or clamp to vertical walls using Unistrut and clamps. Do not hang pipe from other pipe, equipment, or ductwork. Laying of piping on any building element is not allowed.
 - 5. Supports For Horizontal Piping
 - a. Support metal piping at 96 inches on center maximum for pipe 1-1/4 inches or larger and 72 inches on center maximum for pipe 1-1/8 inch or less.
 - b. Provide support at each elbow. Install additional support as required.
 - 6. Supports for Vertical Piping
 - a. Place riser clamps at each floor or ceiling level.

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- b. Securely support clamps by structural members which in turn are supported directly from building structure. Bolt metal struts to wall at riser's as indicated on the Drawinags.
- c. Provide clamps as necessary to brace pipe to struts.
- 7. Insulate hangers for copper pipe from piping by means of at least two layers of Scotch 33 plastic tape.
- D. Provide spring clamp plates (escutcheons) where pipes run through walls, floors, or ceilings and are exposed in finished locations of building. Plates shall be chrome plated heavy brass of plain pattern and shall be set tight on pipe and to building surface.

3.2 FIELD QUALITY CONTROL

A. Site Tests

- 1. Perform tests on piping systems. Furnish devices required for testing purposes.
- 2. Replace material or workmanship proven defective with sound material at no additional cost to Owner. Repeat tests on new material, if requested.

3.3 CLEANING

- A. Remove dirt, grease, and other foreign matter from each length of piping before installation.
 - 1. After each section of piping used for movement of water or steam is installed, flush with clean water, except where specified otherwise.
 - 2. Arrange temporary flushing connections for each section of piping and arrange for flushing total piping system.
 - 3. Provide temporary cross connections and water supply for flushing and drainage and remove after completion of work.

3.4 PROTECTION

A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. Cap or plug open ends of pipes and equipment to keep dirt and other foreign materials out of system. Do not use plugs of rags, wool, cotton waste, or similar materials.

END OF SECTION 22 05 00

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SECTION 22 07 19 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install insulation on domestic hot water lines, fittings, valves and accessories as described in Contract Documents.
- B. Related Sections
 - 1. Section 22 11 16 Domestic Water Piping

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Above Grade
 - 1. Insulation for Piping
 - a. Snap-on glass fiber or melamine foam pipe insulation, or heavy density pipe insulation with factory vapor jacket
 - b. Insulation Thickness -

Service Water Temperature	Pipe Sizes in inches		
Deg F	Up to 1-1/4	1-1/2 to 2	Over 2
140 - 160	1/2	1	1-1/2
45 - 1301/2	1/2	1	

- c. Quality Standards Techlite SSL by Accessible Products or Fiberglas ASJ by Owens-Corning.
- d. Approved Manufacturers -
 - 1) Accessible Products
 - 2) Childers Products
 - 3) Knauf
 - 4) Manson
 - 5) Owens-Corning
 - 6) Johns-Manville
- 2. Fitting, Valve, And Accessory Covers
 - a. PVC
 - b. Quality Standard Techlite SSL-ASJ by Accessible Products
 - c. Approved Manufacturers -
 - 1) Accessible Products
 - 2) Knauf
 - 3) Speedline

4) Zeston by Johns-Manville

PART 3 - EXECUTION

3.1 APPLICATION

A. Hot Water Piping

- 1. Apply insulation to clean, dry piping with joints tightly butted.
- 2. Install insulation in manner to facilitate removal for repairs. Place sections or blocks so least possible damage to insulation will result from inspection or repairs of piping or equipment.
- 3. Piping up to 2 Inch Diameter Adhere 'factory applied vapor barrier jacket lap' smoothly and securely at longitudinal laps with white vapor barrier adhesive. Adhere 3 inch wide self-sealing butt joint strips over end joints.
- 4. Fittings, Valves and Accessories
 - a. Insulate with same type and thickness of insulation as pipe, with ends of insulation tucked snugly into throat of fitting and edges adjacent to pipe insulation tufted and tucked in.
 - b. In Piping Up To 1-1/4 Diameter Cover insulation with one piece fitting cover secured by stapling or taping ends to adjacent pipe covering.
 - 1) Alternate Method Insulate fittings, valves, and accessories with one inch of insulating cement and vapor seal with two 1/8 inch wet coats of vapor barrier mastic reinforced with glass fabric extending 2 inches onto adjacent insulation.
 - c. For Piping 1-1/2 inches To 2 Inches Insulate with hydraulic setting insulating cement or equal, to thickness equal to adjoining pipe insulation. Apply final coat of fitting mastic over insulating cement.
 - d. For Piping 2-1/2 inches and larger Insulate with segments of molded insulation securely wired in place and coated with skim coat of insulating cement. Apply fitting mastic, fitting tape and finish with final coat of fitting mastic.
 - e. Except where pre-formed, pre-finished covers are used, finish fittings regardless of pipe size with 4 oz canvas coated with vapor barrier adhesive.

6. Pipe Hangers -

- a. Do not allow pipes to come in contact with hangers.
- b. Provide 16 ga by 6 inch long galvanized shields at each pipe hanger to protect pipe insulation from crushing by clevis hanger.
- 7. Protect insulation wherever leak from valve stem or other source might drip on insulated surface, with aluminum cover or shield rolled up at edges and sufficiently large in area and of shape that dripping will not splash on surrounding insulation.

END OF SECTION 22 07 19

SECTION 22 11 16 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - Furnish and install potable water piping complete with necessary valves, connections, and accessories inside building and connect to existing piping within the building perimeter as described in Contract Documents.
- B. Related Sections
 - 1. Section 22 05 00 Common Work Results for Plumbing
 - 4. Section 22 07 19 Plumbing Piping Insulation

1.2 REFERENCES

- A. American Society for Testing and Materials
 - 1. ASTM B 88-99, 'Standard Specification for Seamless Copper Water Tube'
- 1.3 SUBMITTALS
 - A. Quality Assurance / Control Written report of sterilization test
- 1.4 QUALITY ASSURANCE
 - A. Pre-Installation Conference Participate in pre-installation conference specified in Section 03313.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Pipe
 - 1. Copper meeting requirements of ASTM B 88, Type L.
- B. Fittings Wrought copper.
- C. Connections
 - 1. Sweat copper type with 95/5 or 96/4 Tin-Antimony solder, Bridgit solder, or Silvabrite 100 solder. Use only lead-free solder.
- D. Ball Valves
 - Use ball valves exclusively unless otherwise specified. Ball valves shall be by single manufacturer from approved list below. Valves shall be two piece, full port for 150 PSI SWP.
 - 2. Quality Standard Nibco T585 or S585, S595
 - 3. Approved Manufacturers -

- a. ConBraCo 'Apollo'
- b. Hammond
- c. Honeywell-Braukmann
- d. Jenkins
- e. Milwaukee
- f. Nibco
- g. Stockham
- h. Watts

PART 3 - EXECUTION

3.1 INSTALLATION

A. Locate cold water lines a minimum of 6 inches from hot water line.

3.2 FIELD QUALITY CONTROL

A. Site Tests - Before pipes are covered, test systems in presence of Architect at 125 psi hydrostatic pressure for 4 hours and show no leaks. Disconnect equipment not suitable for 125 psig pressure from piping system during test period.

3.3 CLEANING

- A. Sterilize potable water system with solution containing 200 parts per million minimum of available chlorine and maintaining pH of 7.5 minimum. Introduce chlorinating materials into system in manner approved by Architect. Allow sterilization solution to remain for 24 hours and open and close valves and faucets several times during that time.
- B. After sterilization, flush solution from system with clean water until residual chlorine content is less than 0.2 parts per million.
- C. Water system will not be accepted until negative bacteriological test is made on water taken from system. Repeat dosing as necessary until such negative test is accomplished.

END OF SECTION 22 11 16

DOMESTIC WATER PIPING

SECTION 22 13 16 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To

- 1. Furnish and install soil, waste, and vent piping systems within building and connect to existing within the building where applicable.
- 2. Perform excavation and backfill required by work of this Section.

B. Related Sections

- 1. Section 02 41 00 Criteria for performance of excavation and backfill
- 2. Section 07 80 00 Quality of Firestopping Material
- 3. Section 22 05 00 Common Work Results for Plumbing

1.2 REFERENCES

A. American Society For Testing And Materials (Latest Standards)

- 1. ASTM A 888, 'Standard Specification for Hubless Cast Iron Soil Pipe and Fittings'
- 2. ASTM D 2235, 'Standard Specification for Solvent Cement for ABS Plastic Pipe and Fittings'
- 3. ASTM D 2321, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications'
- 4. ASTM F 628, 'Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings with a Cellular Core'

B. Cast Iron Soil Pipe Institute

- 1. CISPI 301, Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications.
- 2. CISPI 310, Coupling for use in connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Buried Piping

- 1. Minimum size of waste piping installed under floor slab on grade shall be 2 inches.
- 2. Approved Type
 - a. ABS Schedule 40 cellular core plastic pipe meeting requirements of ASTM F 628 joined with pipe cement meeting requirements of ASTM 2235.
 - b. Service weight, no-hub type cast iron soil pipe meeting requirements of ASTM A 888. All pipe and fittings shall be marked with the Cast Iron Soil Pipe Institute collective trademarks.

- 1) Joint Material
 - a. No-Hub -
 - (1) No-Hub Coupling by Tyler Pipe.
 - (2) Neoprene gaskets with type 304 stainless steel clamp and 24 ga type 304 stainless steel housing by Clamp-All Corp
- B. Above Grade Piping and Vent Lines
 - 1. Approved Types -
 - Service weight, no-hub type cast iron soil pipe meeting requirements of ASTM A 74.
 - Joint Material
 - a. No-Hub Pipe Neoprene gaskets with stainless steel cinch bands.

C. Fittings

- 1. Cast Iron Pipe No-hub and meeting requirements of ASTM A 888. All pipe and fittings shall be marked with the Cast Iron Soil Pipe Institute collective trademarks.
 - a. Joint Material Rubber gaskets meeting requirements of ASTM C 564.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Excavate and backfill as specified in Section 02 41 00 with following additional requirements
 - 1. Runs shall be as close as possible to those shown on Drawings.
 - 2. Excavate to required depth and grade to obtain fall required. Grade soil and waste lines within building perimeter 1/4 inch fall in one foot in direction of flow.
 - 3. Bottom of trenches shall be hard. Tamp as required.
 - 4. Remove debris from trench prior to laying of pipe.
 - 5. Do not cut trenches near footings without consulting Architect.
- B. Metal Pipe and Fittings
 - 1. Provide depression under each joint to maintain even bearing of sewer pipe.
 - 2. Connect to street main as required by local authorities.
 - 3. Use torque wrench to obtain proper tension in cinch bands when using hubless cast iron pipe. Butt ends of pipe against centering flange of coupling.
- C. Thermoplastic Pipe and Fittings
 - 1. General Piping and joints shall be clean and installed according to Manufacturer's recommendations. Break down contaminated joints, clean seats and gaskets and reinstall.
 - 2. Below Grade
 - a. Install in accordance with Manufacturer's recommendations and ASTM D 2321.
 - b. Stabilize unstable trench bottoms.

- c. Bed pipe true to line and grade with continuous support from firm base.
 - 1) Bedding depth 4 to 6 inches.
 - 2) Material and compaction to meet ASTM standard noted above.
- d. Trench width at top of pipe -
 - 1) Minimum 18 inches or diameter of pipe plus 12 inches, whichever is greater.
 - 2) Maximum Outside diameter of pipe plus 24 inches.
- e. Do not use back hoe or power equipment to assemble pipe.
- f. Initial backfill shall be 12 inches above top of pipe with material specified in referenced ASTM standard.
- C. Install piping so cleanouts may be installed as follows
 - 1. Where shown on Drawings and near bottom of each stack and riser.
 - 2. At every 135 degrees of accumulative change in direction for horizontal lines.
 - 3. Every 100 feet of horizontal run.
 - 4. Extend piping to accessible surface. Do not install piping so cleanouts must be installed in carpeted floors. In such locations, configure piping so wall type cleanouts may be used.
- D. Each fixture and appliance discharging water into sanitary sewer or building sewer lines shall have seal trap in connection with complete venting system so gasses pass freely to atmosphere with no pressure or syphon condition on water seal.
- E. Vent entire waste system to atmosphere. Join lines together in fewest practicable number before projecting above roof. Set back vent lines so they will not pierce roof near edge or valley. Vent line terminations shall be
 - 1. 6 inches minimum above roof and 12 inches minimum from any vertical surface.
 - 2. Same size as vent pipe.
 - 3. In areas where minimum design temperature is below 0 deg F or where frost or snow closure may be possible
 - a. Vent line terminations shall be same size as vent pipe, except no smaller than 2 inches in diameter.
 - b. Vents shall terminate 10 inches minimum above roof or higher if required by local codes.
- F. Furnish and install firestopping at penetrations of fire-rated structures as required under Sections 07840 and 15051.

3.2 FIELD QUALITY CONTROL

- A. Site Tests
 - 1. Conduct tests for leaks and defective work. Notify Architect prior to testing.

- 2. Metal Pipe System After backfilling and compacting of trenches is complete but before placing floor slab, fill waste and vent system to roof level with water, 10 feet minimum, and show no leaks for two hours. Uncover pipe and correct leaks and defective work. Re-backfill and compact and re-test.
- 2. Thermoplastic Pipe System
 - a. Before backfilling and compacting of trenches, cap all open ends and pressure test to 20 psi for 4 hours with no leaks. Correct leaks and defective work.
 - b. After backfilling and compacting of trenches is complete but before placing floor slab, re-test as specified above. Uncover pipe and correct leaks and defective work. Re-backfill and compact and re-test.

END OF SECTION 22 13 16

SECTION 22 41 00 - RESIDENTIAL PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install plumbing fixtures as described in Contract Documents.
- B. Related Sections
 - 1. Section 22 05 00 Common Work Results for Plumbing
 - 3. Section 22 11 16 Domestic Water Piping

PART 2 - PRODUCTS

2.1 GENERAL

- A. Interior exposed pipe, valves, and fixture trim, including trim behind custom casework doors, shall be chrome plated.
- B. Flow Control Fittings Vandal proof type and fit faucet spout of fixture used. Flow shall be controlled as required by local codes.

2.2 MANUFACTURED UNITS

- A. Water Closets
 - 1. Maximum water usage of 1.28 gallons per flush.
 - 2. Elongated, floor mounted, flush tank, 16.5" rim height.
 - 3. Supply Pipe and Stop
 - a. Provide stuffing box and chrome plating.
 - b. Approved Products -
 - 1) Brass Craft TCR 1912 DL-CP
 - 2) Zurn Z8804-LR-PC
- B. Lavatories and Sinks -
 - 1. Fixtures As scheduled on the Drawings.
 - a. Supply pipes with stops
 - 1) Provide stuffing box and chrome plating.
 - 2) Approved Products
 - a) Brass Craft TCR 1912 A-CP
 - b) Zurn -Z8804 LR-PC
 - b. Trap -

- 1) 17 ga tube 'P' trap, chrome plated
- 2) Approved Manufacturers
 - a) Dearborn
 - b) Keeney Manufacturing
 - c) Zurn Traps & Supplies
- C. Insulated hot water piping, trap and trap arm exposed under lavatories.
- D. Cleanouts
 - 1. Furnish wall cleanouts with chrome wall cover and screw.
 - 2. Finished Wall
 - a. Approved Products -
 - 1) Josam 58790
 - 2) J. R. Smith 4530
 - 3) Wade W8460R
 - 4) Zurn Z-1446
 - 3. Exposed Drain Lines
 - a. Approved Products -
 - 1) Josam 58910
 - 2) J. R. Smith 4510
 - 3) Wade W8560A
 - 4) Zurn Z-1440-4
 - 4. General Purpose
 - a. Approved Products -
 - 1) Josam 58900
 - 2) J. R. Smith 4400
 - 3) Wade W8550A
 - 4) Zurn Z-1440-4

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fixtures including traps and accessories with accessible stop or control valve in each hot and cold water branch supply line.
- B. Make fixture floor connections with approved brand of cast iron floor flange, soldered or calked securely to waste pipe. Make joints between fixtures and floor flanges tight with approved fixture setting compound or gaskets. Calk between fixtures and wall and floor with sealant specified in Section 07920. Point edges.

3.2 CLEANING

A. Polish chrome finish at completion of Project.

END OF SECTION 22 41 00

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To

- 1. General requirements and procedures for mechanical systems.
- 2. Responsibility for proper operation of electrically powered equipment furnished under this Division.
- 3. Interface with Testing And Balancing Agency.
- 4. Furnish and install sealants relating to installation of systems installed under this Division.
- 5. Furnish and install Firestop Penetration Systems for mechanical system penetrations as described in Contract Documents.

B. Products Supplied But Not Installed Under This Section

 Sleeves, inserts, supports, and equipment for mechanical systems installed under other Sections.

C. Related Sections

- 1. Sections Under Division 9 Painting of mechanical items requiring field painting
- 2. Section 26 29 00 Magnetic starters and thermal protective devices (heaters) not factory mounted integral part of mechanical equipment
- 3. Division 26 Raceway and conduit, unless specified otherwise, line voltage wiring, outlets, and disconnect switches
- 4. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.

1.2 SUBMITTALS

A. Product Data

- 1. Manufacturer's catalog data for each manufactured item.
 - a. Provide section in submittal for each type of item of equipment. Include Manufacturer's catalog data of each manufactured item and enough information to show compliance with Contract Document requirements. Literature shall show capacities and size of equipment used and be marked indicating each specific item with applicable data underlined.
 - b. Include name, address, and phone number of each supplier.

B. Shop Drawings

- 1. Schematic control diagrams for each separate fan system, heating and air conditioning system, control panel, etc. Each diagram shall show locations of all control and operational components and devices. Mark correct operating settings for each control device on these diagrams.
- 2. Diagram for electrical control system showing wiring of related electrical control items such as firestats, fuses, interlocks, electrical switches, and relays. Include drawings showing electrical power requirements and connection locations.
- 3. Other shop drawings required by Division 23 trade Sections.

C. Closeout

- 1. Operation and Maintenance Manual Data
 - a. Modify and add to requirements of Section 01 78 23 as follows -
 - 1) At beginning of MECHANICAL section of Operations and Maintenance Manual, provide master index showing items included.
 - 2) Provide name, address, and phone number of Architect, Architect's Mechanical Engineer, General Contractor, and Mechanical, Sheet Metal, Refrigeration, and Temperature Control subcontractors.
 - Provide operating instructions to include
 - a) General description of each plumbing and mechanical system.
 - b) Step by step procedure to follow in putting each piece of mechanical equipment into operation.
 - c) Provide diagrams for electrical control system showing wiring of items such as smoke detectors, fuses, interlocks, electrical switches, and relays.
 - 4) Identify maintenance instructions by using same equipment identification used in Contract Drawings. Maintenance instructions shall include
 - a) List of mechanical equipment used indicating name, model, serial number, and name plate data of each item together with number and name associated with each system item.
 - b) Manufacturer's maintenance instructions for each piece of mechanical equipment installed in Project. Instructions shall include name of vendor, installation instructions, parts numbers and lists, operation instructions of equipment, and maintenance and lubrication instructions.
 - c) Summary list of mechanical equipment requiring lubrication showing name of equipment, location, and type and frequency of lubrication.
 - d) Manual for thermostat published by its manufacturer.
 - 5) Include copies of approved shop drawings and copies of warranties required in individual Sections of Division 23.

1.3 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies
 - 1. Perform work in accordance with applicable provisions of the 2007 California Mechanical Code, and adoptions thereof. Provide materials and labor necessary to comply with rules, regulations and ordinances.
 - 2. In case of differences between building codes, state laws, local ordinances, utility company regulations and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.
- B. Identification

- 1. Motor and equipment name plates as well as applicable UL and AGA labels shall be in place when Project is turned over to Owner.
- 2. Materials shall bear Manufacturer's name and trade name. Equipment and materials of same general type shall be of same make throughout work to provide uniform appearance, operation and maintenance.

1.4 DELIVERY, STORAGE AND HANDLING

A. Storage

- In addition to requirements specified in Division 01, stored material shall be readily accessible for inspection by Architect until installed.
- 2. Store items subject to moisture damage, such as controls, in dry, heated spaces.
- B. Handling Protect bearings during installation. Thoroughly grease steel shafts to prevent corrosion.

1.5 WARRANTY

- A. Guarantee heating and cooling systems to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.
- B. Provide certificates of warranty for each piece of equipment made out in favor of Owner. Clearly record 'start-up' date of each piece of equipment on certificate.
- C. If mechanical sub-contractor with offices located more than 150 miles from Project site is used, provide service / warranty work agreement for warranty period with local mechanical sub-contractor approved by Architect. Include copy of service / warranty agreement in warranty section of Operation And Maintenance Manual.

1.6 SYSTEM START-UP

A. Off-Season Start-up

- If Substantial Completion inspection occurs during heating season, schedule spring startup of cooling systems. If inspection occurs during cooling season, schedule autumn startup for heating systems.
- 2. Notify Owner seven days minimum before scheduled start-up.
- 3. Time will be allowed to completely service, test, check, and off-season start systems. During allowed time, train Owner's representatives in operation and maintenance of system.
- 4. At end of off-season start-up, furnish Owner with letter confirming that above work has been satisfactorily completed.
- B. Preparations that are to be completed before start up and operation include, but are not limited to, following
 - 1. Dry out electric motors and other equipment to develop and properly maintain constant insulation resistance.
 - 2. Make adjustments to insure that
 - a. Equipment alignments and clearances are adjusted to allowable tolerances.
 - Nuts and bolts and other types of anchors and fasteners are properly and securely fastened.

- Packed, gasketed, and other types of joints are properly made up and are tight and free from leakage.
- d. Miscellaneous alignings, tightenings, and adjustings are completed so systems are tight and free from leakage and equipment performs as intended.
- 3. Motors and accessories are completely operable.
- 4. Inspect and test electrical circuitry, connections, and voltages to be properly connected and free from shorts.
- 5. Adjust drives for proper alignment and tension.
- 6. Make certain filters in equipment for moving air are new and of specified type.
- 7. Properly lubricate and run-in bearings in accordance with Manufacturer's directions and recommendations.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

Site Inspection

- 1. Examine premises to understand conditions which may affect performance of work of this Division before submitting proposals for this work. Examine adjoining work on which mechanical work is dependent for efficiency and report work which requires correction.
- No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

B. Drawings

- Mechanical Drawings show general arrangement of piping, ductwork, equipment, etc.
 Follow as closely as actual building construction and work of other trades will permit.
- 2. Consider Architectural and Structural Drawings part of this work insofar as these drawings furnish information relating to design and construction of building. These drawings take precedence over Mechanical Drawings.
- 3. Because of small scale of Drawings, it is not possible to indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions.
- C. Ensure that items to be furnished fit space available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents. If approval is received by Addendum or Change Order to use other than originally specified items, be responsible for specified capacities and for ensuring that items to be furnished will fit space available.

3.3 PREPARATION

- A. Check that slots and openings provided under other Divisions through floors, walls, ceilings, and roofs are properly located. Perform cutting and patching caused by neglecting to coordinate with Divisions providing slots and openings at no additional cost to Owner.
- B. Changes Due To Equipment Selection

- 1. Where equipment specified or otherwise approved requires different arrangement or connections from that shown in Contract Documents, submit drawings, if requested by Architect, showing proposed installations.
- 2. If proposed changes are approved, install equipment to operate properly and in harmony with intent of Contract Documents. Make incidental changes in piping, ductwork, supports, installation, wiring, heaters, panelboards, and as otherwise necessary.
- 3. Provide any additional motors, valves, controllers, fittings, and other additional equipment required for proper operation of the system resulting from selection of equipment, including all required changes in affected trades.
- 4. Be responsible for the proper location of roughing-in and connections provided under other Divisions.

3.4 INSTALLATION

Interface With Other Work

- 1. Electrical Furnish exact location of electrical connections and complete information on motor controls to installer of electrical system.
- 2. Testing And Balancing
 - a. Put mechanical systems into full operation and continue their operation during each working day of testing and balancing.
 - b. Make changes in pulleys, belts, fan speeds, and dampers or add dampers as required for correct balance as recommended by appropriate Sections of Division 13 and at no additional cost to Owner.
- B. Cut carefully to minimize necessity for repairs to previously installed or existing work. Do not cut beams, columns, or trusses.

C. Locating Equipment

- Arrange pipes, ducts, and equipment to permit ready access to valves, cocks, unions, traps, filters, starters, motors, control components, and to clear openings of doors and access panels.
- 2. Adjust locations of pipes, ducts, switches, panels, equipment, and fixtures to accommodate work to interferences anticipated and encountered.
- 3. Install mechanical work to permit removal of equipment and parts of equipment requiring periodic replacement or maintenance without damage to or interference with other parts of equipment or structure.
- 4. Determine exact route and location of each pipe and duct prior to fabrication.

a. Right-Of-Way -

- 1) Lines which pitch shall have right-of-way over those which do not pitch. For example, condensate and plumbing drains shall normally have right-of-way.
- 2) Lines whose elevations cannot be changed shall have right-of-way over lines whose elevations can be changed.
- b. Offsets, Transitions, and Changes in Direction -
 - 1) Make offsets, transitions, and changes in direction in pipes and ducts as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.

- 2) Furnish and install traps, air vents and devices required to effect these offsets, transitions, and changes in direction.
- D. Penetration Firestops Install Penetration Firestop System appropriate for penetration at mechanical system penetrations through walls, ceilings, roofs and top plates of walls.

E. Sealants

- 1. Seal openings through building exterior caused by penetrations of elements of mechanical systems.
- 2. Furnish and install acoustical sealant to seal penetrations through acoustically insulated walls and ceilings.

3.3 REPAIR / RESTORATION

- A. Each Section of this Division shall bear expense of cutting, patching, repairing, and replacing of work of other Sections required because of its fault, error, tardiness, or because of damage done by it.
 - 1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown.
 - 2. Surface finishes shall exactly match existing finishes of same materials.
- B. Cutting, patching, repairing, and replacing pavements, sidewalks, roads, and curbs to permit installation of work of this Division is responsibility of Section installing work.

3.4 CLEANING

- A. Clean exposed piping, ductwork, equipment and fixtures.
- B. No more than one week before Final Inspection, flush out bearings and clean other lubricated surfaces with flushing oil. Provide best quality and grade of lubricant specified by Equipment Manufacturer.
- C. Replace filters in equipment for moving air with new filters of specified type no more than one week before Final Inspection.

3.5 PROTECTION

- A. Do not operate pieces of equipment used for moving supply air without proper air filters installed properly in system.
- B. After start-up, continue necessary lubrication and be responsible for damage to bearings while equipment is being operated up to Substantial Completion.

END OF SECTION 23 05 00

SECTION 23 07 09 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install insulation on hydronic heating piping, condensate drain piping and refrigerant piping and fittings as described in Contract Documents. Insulate all piping including existing, where accessible.
- B. Related Sections
 - 1. Section 23 05 00 Common Work Results for HVAC.
 - 2. Section 23 21 13 Hydronic Piping
 - 3. Section 23 21 16 Condensate Drain Piping
 - 4. Section 23 23 00 Refrigerant Piping System

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Flexible Foamed Pipe Insulation
 - 1. Thickness
 - a. 1/2 inch for 3/4 inch outside diameter and smaller pipe.
 - b. One inch for one inch outside diameter and larger pipe.
 - c. One inch sheet for fittings as recommended by Manufacturer.
 - 2. Approved Products
 - a. AP Armaflex by Armacell
 - b. Rubatex
- B. Joint Sealer
 - 1. Approved Products
 - a. Armaflex 520 by Armacell
 - b. BFG Construction Adhesive No. 105
 - c. Rubatex R-373
- C. Insulation Tape
 - 1. Approved Products
 - a. Armaflex AP Tape by Armacell
 - b. R-180-FS Tape by Rubatex

D. Exterior Finish

- 1. Approved Products
 - a. WB Armaflex Finish by Armacell
 - b. Protective Coating 67x944 by Rubatex

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

- Install insulation in snug contact with pipe and in accordance with Manufacturer's recommendations.
 - a. Insulate flexible pipe connectors.
 - b. Insulate thermal expansion valves with insulating tape.
 - c. Insulate fittings with sheet insulation and as recommended by Manufacturer.
- 2. Slip insulation on tubing before tubing sections and fittings are assembled keeping slitting of insulation to a minimum.
- 3. Do not install insulation on lines through clamp assembly of pipe support. Butt insulation up against sides of clamp assembly.
- 4. Stagger joints on layered insulation. Seal joints in insulation.
- 5. Install insulation exposed outside building so 'slit' joint seams are placed on bottom of pipe.
- 6. Paint exterior exposed insulation with two coats of specified exterior finish.

B. System Requirements

1. Split System Heat Pump Units - Install insulation on above-ground refrigerant liquid and suction piping and fittings.

END OF SECTION 23 07 09

SECTION 23 07 13 - DUCT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - Furnish and install thermal wrap duct insulation as described in Contract Documents.
- B. Related Work
 - 1. Section 23 07 13 Metal Ducts
 - 2. Section 23 33 53 Duct Liners

1.2 REFERENCES

- A. American Society for Testing and Materials
 - 1. ASTM B 209-01, 'Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate'

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Thermal Wrap Duct Insulation
 - 1. 1-1/2 inch thick fiberglass with factory-laminated, reinforced aluminum foil scrim kraft facing and density of one lb/ per cu ft.
 - 2. Thermal Conductivity 0.27 BTU in/HR SF deg F at 75 deg F maximum.
 - 3. Approved Products
 - a. Type 100 standard duct insulation by Certainteed St Gobain,
 - b. Microlite FSK by Johns-Manville
 - c. Duct Wrap FSK by Knauf Fiber Glass
 - d. FRK by Owens-Corning

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Thermal Wrap Duct Insulation
 - 1. Install insulation as follows
 - a. On sheet metal supply and return air ducts plenums and fittings that are not acoustically lined.
 - b. On other air ducts where indicated on Drawings.
 - 2. Wrap insulation tightly on duct work with circumferential joints butted and longitudinal joints overlapped minimum 2 inches.

- a. Do not compress insulation except in areas of structural interference. Minimum thickness at corners shall be one inch thick.
- b. Remove insulation from lap prior to stapling.
- c. Staple seams at approximately 16 inches on center with outward clenching staples.
- d. Seal seams with foil vapor barrier tape or vapor barrier mastic. Seal penetrations of facing to provide vapor tight system.

END OF SECTION 23 07 13

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SECTION 23 21 13 - HYDRONIC PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install hydronic piping complete with necessary valves, connections and accessories inside building above residential bathrooms as described in Contract Documents.
- B. Related Sections
 - 1. Section 23 05 00 Common Work Results for HVAC.

1.2 REFERENCES

- A. American Society For Testing And Materials
 - 1. ASTM B 88-93, "Standard Specification for Seamless Copper Water Tube"

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Pipe
 - 1. Meet requirements of ASTM B 88.
 - a. Type K hard drawn.
- B. Fittings Wrought copper.
- C. Connections
 - 1. Sweat copper type with 95/5 or 96/4 Tin-Antimony solder or Silvabrite 100 solder.
 - 2. Use only lead-free solder.
- D. Ball Valves
 - Use ball valves exclusively unless otherwise specified. Ball valves shall be by single manufacturer from approved list below. Valves shall be two piece, full port for 150 PSI SWP.
 - 2. Quality Standard Nibco-Scott T585 or S585
 - 3. Approved Manufacturers
 - a. ConBraCo (Apollo)
 - b. Hammond

- c. Honeywell-Braukmann
- d. Jenkins
- e. Milwaukee
- f. Nibco-Scott
- g. Stockham
- h. Watts

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install piping parallel or perpendicular to walls. Suspend with clevis hangers.
- B. Insulate all hydronic piping.

3.2 FIELD QUALITY CONTROL

A. Site Tests - Before pipes are concealed, test systems at 100 psi hydrostatic pressure for two hours and show no leaks.

END OF SECTION 23 21 13

SECTION 23 21 16 - CONDENSATE DRAIN PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install condensate drain piping as required by the replacement of the split-system heat pump fan coils as described in Contract Documents.
- B. Related Sections
 - 1. Section 23 05 00 Common Work Results for HVAC
 - 2. Section 23 81 43 Air-Source Split-System Heat Pumps

1.2 REFERENCES

- A. American Society for Testing and Materials
 - 1. ASTM B 88-99, 'Standard Specification for Seamless Copper Water Tube'

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Condensate Drains
 - 1. Type M copper meeting requirements of ASTM B 88.
 - 2. 3 inch deep seal, vented water trap adjacent to cooling coil connection.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Condensate Drains
 - 1. Support piping and protect from damage.

END OF SECTION 23 21 16

SECTION 23 23 00 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - Furnish and install piping and specialties for refrigeration systems as described in Contract Documents.
- B. Related Sections
 - 1. Section 23 05 00 Common Work Results for HVAC
 - 2. Section 23 07 19 HVAC Piping Insulation

1.2 REFERENCES

- A. American National Standards Institute / American Welding Society
 - 1. ANSI / AWS A5.8-92, 'Standard Specification for Brazing Alloys'
- B. American Society For Testing And Materials
 - 1. ASTM A 36-00a, 'Standard Specification for Carbon Structural Steel'
 - 2. ASTM A 361-94, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process for Roofing and Siding'
 - 3. ASTM B 280-99, 'Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service'

1.3 SUBMITTALS

- A. Shop Drawings Show each individual equipment and piping support
- B. Quality Assurance / Control Technician certificate for use of CFC and HCFC refrigerants

1.4 QUALITY ASSURANCE

A. Qualifications - Refrigerant piping shall be installed by a refrigeration contractor licensed by State and by technicians certified in use of CFC and HCFC refrigerants.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Refrigerant Piping
 - 1. Heat pump manufacturer's pre-charge soft copper tubing refrigerant lines.
- B. Connection Material

- 1. Brazing Rods in accordance with ANSI / AWS A5.8
 - a. Copper to Copper Connections -
 - 1) Classification BCuP-4 Copper Phosphorus (6 percent silver).
 - 2) Classification BCuP-5 Copper Phosphorus (15 percent silver).
 - b. Copper to Brass or Copper to Steel Connections Classification BAg-5 Silver (45 percent silver).
 - c. Do not use rods containing Cadmium.
- 2. Flux
 - a. Approved Products
 - 1) Stay-Silv White Brazing Flux by J W Harris
 - 2) High quality silver solder flux by Handy & Harmon
- C. Valves
 - 1. Expansion Valves
 - a. For pressure type distributors, externally equalized with stainless steel diaphragm, and same refrigerant in thermostatic elements as in system.
 - b. Size valves to provide full rated capacity of cooling coil served. Coordinate selection with evaporator coil and condensing unit.
 - c. Approved Manufacturers -
 - 1) Alco
 - 2) Henry
 - 3) Mueller
 - 4) Parker
 - 5) Sporlan
- D. Filter-Drier
 - 1. On lines 3/4 inch outside diameter and larger, filter-drier shall be replaceable core type with Schraeder type valve.
 - 2. On lines smaller than 3/4 inch outside diameter, filter-drier shall be sealed type using flared copper fittings.
 - 3. Size shall be full line size.
 - 4. Approved Manufacturers
 - a. Alco
 - b. Mueller
 - c. Parker
 - d. Sporlan
 - e. Virginia

2.2 MATERIALS

- A. Refrigerant Piping Supports
 - 1. Base, Angles, And Uprights Steel meeting requirements of ASTM A 36.
 - 2. Securing Channels
 - a. At Free-Standing Pipe Support -
 - 1) Acceptable Products
 - a) P-1000 channels by Unistrut
 - b) HS-158-12 channels by Hilti
 - c) Equal as approved by Architect prior to installation. See Section 01600.
 - b. At Wall Support -
 - 1) Acceptable Products
 - a) P-3300 channels by Unistrut
 - b) HS-1316-12 channels by Hilti
 - c) Equal as approved by Architect prior to installation. See Section 01600.
 - c. At Suspended Support -
 - 1) Acceptable Products
 - a) P-1001 channels by Unistrut
 - b) MS-41 channels by Hilti
 - c) Equal as approved by Architect prior to installation. See Section 01600.
 - 3. Angle Fittings
 - a. Acceptable Products -
 - 1) P-2626 90 degree angle by Unistrut
 - 2) MW2 angle by Hilti
 - 3) Equal as approved by Architect prior to installation. See Section 01600.
 - 4. Pipe Clamps
 - a. Acceptable Manufacturers -
 - 1) Hydra-Zorb
 - 2) ZSI Cush-A-Clamp
 - 3) Hilti Cush-A-Clamp
 - 4) Equal as approved by Architect prior to installation. See Section 01600.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Refrigerant Lines

1. Install concealed above ceilings, in walls and piping chases.

B. Connections

- 1. Refrigeration system connections shall be copper-to-copper, copper-to-brass, or copper-to-steel type properly cleaned and brazed with specified rods. Use flux only where necessary. No soft solder (tin, lead, antimony) connections will be allowed in system.
- 2. Circulate dry nitrogen through tubes being brazed to eliminate formation of copper oxide during brazing operation.

C. Specialties

- 1. Install valves and specialties in accessible locations.
- Install thermostatic bulb as close to cooling coil as possible. Do not install on vertical lines.

D. Refrigerant Supports

- 1. Support Spacing
 - a. Piping 1-1/4 inch And Larger 8 feet on center maximum.
 - b. Piping 1-1/8 inch And Smaller 6 feet on center maximum.
 - c. Support each elbow.
- 2. Isolate pipe from supports and clamps with Hydrozorb or Cush-A-Clamp systems.
- 3. Run protective cover continuous from condensing units to risers or penetrations at building wall.

3.2 FIELD QUALITY CONTROL

- A. Make evacuation and leak tests in presence of Owner's Representative after completing refrigeration piping systems.
 - 1. Do not run systems until above tests have been made and systems started up as specified. Inform Owner's Representative of status of systems at time of final inspection and schedule start-up and testing if prevented by outdoor conditions before this time.
 - 2. After testing, fully charge system with refrigerant and conduct test with Halide Leak Detector.
 - 3. Recover all refrigerant in accordance with applicable codes. Do not allow any refrigerant to escape to atmosphere.
- B. If it is observed that refrigerant lines are being or have been brazed without proper circulation of nitrogen through lines, all refrigerant lines installed up to that point in time shall be removed and replaced at no additional cost to Owner.

END OF SECTION 23 23 00

SECTION 23 31 00 METAL DUCTS

PART 1 – GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
- B. Related Sections:
 - 1. Section 23 07 13 Duct Insulation

1.2 REFERENCES

- A. SMACNA's "HVAC Duct Construction Standards Metal and Flexible."
- B. SMACNA's "Seismic Restrain Manual Guidelines for Mechanical Systems."

1.3 SYSTEM DESCRIPTION

A. Duct system design, as indicated, has been used to select and size air-moving and distribution equipment and other components of air system. Changes to layout or configuration of duct system must be specifically approved in writing by Architect. Accompany requests for layout modifications with calculations showing that proposed layout will provide original design results without increasing system total pressure.

1.4 SUBMITTALS

A. Product Data: For duct liner and sealing materials.

1.5 QUALITY ASSURANCE

- A. Comply with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems, " unless otherwise indicated.
- B. Comply with SMACNA "HVAC Duct Construction Standards Metal and Flexible."

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver sealant and firestopping materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multicomponent materials.
- B. Store and handle sealant and firestopping materials according to manufacturer's written recommendations.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 53/A 653M, G90 (Z275) coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.

2.2 DUCT LINER

- A. General: Comply with NFPA 90 A or NFPA 90B and NAIMA's "Fibrous Glas Duct Liner Standard."
- B. Materials: ASTM C 1071 with coated surface exposed to airstream to prevent erosion of glass fibers.
 - 1. Thickness: 1 inch
 - 2. Thermal Conductivity (k-Value): 0.26 at 75 degrees F (0.037 at 24 degrees C) mean temperature.
 - 3. Fire-Hazard Classification: Maximum flame-spread rating of 25 and smokedeveloped rating of 50, when tested according to ASTM C 411.
 - 4. Liner Adhesive: Comply with NFPA 90A or NFPA 90B and ASTM C 916.
 - Mechanical Fasteners: Galvanized steel, suitable for adhesive attachment, mechanical attachment or welding attachment to duct without damaging liner when applied as recommended by manufacturer and without causing leakage in duct.
 - a. Tensile Strength: Indefinitely sustain a 50-pound-(23-kg-) tensile, dead-load test perpendicular to duct wall.
 - b. Fastener Pin Length: As required for thickness of insulation and without projecting more than 1/8 inch (3mm) into airstream.
 - Adhesive for Attaching Mechanical Fasteners: Comply with firehazard classification of duct liner system.
 - d. All duct liner shall be both glued and pinned in place.

2.3 SEALANT MATERIALS

- A. Joint and Seam Sealants, General: The term "sealant" is not limited to materials of adhesive or mastic nature, but includes tapes and combinations of open-weave fabric strips and mastics.
 - 1. Joint and Seam Tape: 2 inches (50mm) wide; glass-fiber fabric reinforced.
 - 2. Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral compound and modified acrylic/silicone activator to react exothermically with tape to form a hard, durable, airtight seal.
 - 3. Joint and Seam Sealant: One-part, non-sag, solvent-release-curing, polymerized butyl sealant, formulated with a minimum of 75 percent solids.
 - 4. Flanged Joint Mastics: One-part, acid-curing, silicone, elastomeric joint sealants, complying with ASTM C920, Type S, Grade NC, Class 25, Use O.

2.4 HANGERS AND SUPPORTS

- A. Building Attachments: Concrete inserts, powder-actuated fasteners or structural-steel fasteners appropriate for building materials.
 - 1. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches (100 mm) thick.
 - 2. Exception: Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- B. Hanger Materials: Galvanized, sheet steel or round, threaded steel rod.

- Hangers Installed in Corrosive Atmospheres: Electro galvanized, all-thread rod or galvanized rods with threads painted after installation.
- Straps and Rod sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".
- C. Duct Attachments: Sheet metal screws, blind rivets or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.
 - 1. Supports for Galvanized Steel Ducts: Galvanized steel shapes and plates.
 - 2. Supports for Stainless Steel Ducts: Stainless steel support materials.
 - 3. Supports for Aluminum Ducts: Aluminum support materials, unless materials are electrolytically separated from ductwork.

2.5 RECTANGULAR DUCT FABRICATION

- A. General: Fabricate ducts, elbows, transitions, offsets, branch connections and other construction with galvanized, sheet steel, according to SMACNA's "HVAC Duct Construction Standards Metal and Flexible." Comply with requirements for metal thickness, reinforcing types and intervals, tie0rod applications and joint types and intervals.
 - 1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classifications.
 - 2. Materials: Free from visual imperfections such as pitting, seam marks, roller marks, stains and discolorations.
- B. Static Pressure Classifications: Unless otherwise indicated, construct ducts to the following:
 - 1. Supply Ducts: 3-inch wg (750 Pa).
 - 2. Return Ducts: 2-inch wg (500 Pa).
 - 3. Exhaust Ducts: 2-inch wg (500 Pa).
- Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches (480 mm) and larger and 0.0359 inch (0.9 mm) thick or less, with more than 10 sq. ft. ((0.93 sq. m) of unbraced panel area, unless ducts are lined.

2.6 SHOP APPLICATION OF LINER IN RECTANGULAR DUCTS

- A. Adhere a single layer of indicated thickness of duct liner with 90 percent coverage of adhesive at liner contact surface area. Multiple layers of insulation to achieve indicated thickness are prohibited. Use minimum insulation consistent with make and thermal requirements. Comply with NAIMA standards for installation.
- B. Apply adheasive to liner facing in direction of airflow not receiving metal nosing.
- C. Butt transverse joints without gaps and coat joint with adhesive.

- D. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted overlapping.
- E. Don not apply liners in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and standard liner product dimensions make longitudinal joints necessary.
- F. Apply adhesive coating on longitudinal seams in all ducts.
- G. Secure liner with mechanical fasteners 4 inches (100 mm) from corners and at intervals not exceeding 12 inches (300mm) transversely around perimeter; at 3 inches (75 mm) from transverse joints and at intervals not exceeding 18 inches (450 mm) longitudinally.
- H. Secure transversely oriented liner edges facing the airstream with metal nosing that have either channel or "Z" profile or are integrally formed from duct wall. Fabricate edge facings at the following locations:
 - 1. Fan discharge.
 - 2. Intervals of lined duct preceding unlinded duct.
 - 3. Upstream edges of transverse joints in ducts.
- I. Terminate liner with duct buildouts installed in ducts to attach dampers, turning vane assemblies and other devices. Fabricated buildouts (metal hat sections) or other buildingout means are optional; when used, secure buildouts to duct wall with bolts, screws, rivets or welds. Terminate liner at fire dampers at connection to fire-damper sleeve.
- J. All duct liner shall be both glued and pinned in place.

2.7 ROUND DUCT FABRICATION

A. Fabricate supply ducts of galvanized steel according to SMACNA's "HVAC Duct Construction Standards – Metal and Flexible".

2.8 ROUND SUPPLY AND EXHAUST FITTING FABRICATIONS

- A. 90-Degree Tees and Laterals and Conical Tees: Fabricate to comply with SMACNA's "HVAC Duct Construction Standards Metal and Flexible" with metal thicknesses specified for longitudinal seam straight duct.
- B. Diverging-Flow Fittings: Fabricate with a reduced entrance to branch taps with no excess material projecting from body onto branch tap entrance.
- Elbows: Fabricate in die-formed, gored, pleated or mitered construction. Fabricate bend radius of die-formed, gored and pleated elbows one and one-half times elbow diameter. Unless elbow construction type is indicated, fabricate elbows as follows:
 - Mitered Elbow Radius and Number of Pieces: Welded construction complying with SMACNA's "HVAC Duct Construction Standards – Metal and Flexible" unless otherwise indicated.
 - 2. Round Mitered Elbows: Welded construction with the following metal thickness for pressure classes from minus 2- to plus 2-inch wg (minus 500 to plus 500 Pa):

- a. Ducts 3 to 26 Inches (75 to 660 mm) in Diameter: 0.028 inch (7 mm).
 b. Ducts 27 to 36 Inches (685 to 915 mm) in Diameter: 0.034 inch (0.85 mm).
- 3. Round Elbows, 8 Inches (200 mm) and Smaller: Fabricate die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60 and 90 degrees only. Fabricate non-standard bend-angle configuration or non-standard diameter elbows with gored construction.
- 4. Round Elbows, 9 through 14 Inches (225 through 355 mm): fabricate gored or pleated elbows for 30, 45, 60 and 90 degrees, unless space restrictions require a mitered elbow. Fabricate non-standard bend-angle configuration or non-standard diameter elbows with gored construction.
- 5. Round Elbows, Larger than 14 Inches (355 mm) and All Flat-Oval Elbows: Fabricate gored elbows, unless space restrictions require a mitered elbow.
- 6. Die-Formed Elbows for Sizes through 8 Inches (200 mm) and All Pressures: 0.040 inch (1.0 mm) thick with two-piece welded construction.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION, GENERAL

- A. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts, fittings and accessories.
- B. Construct and install each duct system for the specific duct pressure classification indicated.
- C. Install round ducts in lengths not less than 12 feet (3.7 m), unless interrupted by fittings.
- D. Install ducts with fewest possible joints.
- Install fabricated fittings for changes in directions, changes in size and shape and connections.
- F. Install couplings tight to duct wall surface with a minimum of projections into duct.
- G. Install ducts, unless otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs.
- H. Install ducts close to walls, overhead construction, columns and other structural and permanent enclosure elements of building.
- I. Install ducts with a clearance of 1 inch (25 mm), plus allowance for insulation thickness.
- J. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions, unless specifically indicated.
- K. Coordinate layout with suspended ceiling, fire- and smoke-control dampers, lighting layouts and similar finished work.
- L. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.

- M. Non-Fire Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same metal thickness as dduct. Overlap opening on four sides by at least 1-1/2 inches (38 mm).
- N. All duct liner shall be both glued and pinned in place. All seams and edges shall be sealed with adhesive coating.

3.2 SEAM AND JOINT SEALING

- A. General: Seal duct seams and joints according to the duct pressure class indicated and as described in SMACNA's "HVAC Duct Construction Standards Metal and Flexible".
- B. Pressure Classifications Less than 20Inch gw (500 Pa): Transverse joints.
- C. Seal externally insulation ducts before insulation installation.

3.3 HANGING AND SUPPORTING

- A. Install rigid round, rectangular and flat-oval metal duct with support systems indicated in SMACNA's "HVAC Duct Construction Standard Metal and Flexible".
- B. Support horizontal ducts within 24 inches (600 mm) of each elbow within 48 inches (1200 mm) of each branch intersection and as outlined in SMACNA's "Seismic Restraint Manual Guidelines for Mechanical Systems".
- C. Support vertical ducts at a maximum interval of 16 feet (5 m) and at each floor.
- D. Install upper attachment to structure with an allowable load not exceeding on-fourth of failure (proof-test) load.
- E. Install concrete inserts before placing concrete.
- F. Install powder-actuated concrete fasteners after concrete is placed and completely cured.

3.4 FIELD QUALITY CONTROL

- A. Disassemble, reassemble and seal segments of systems as required to accommodate leakage testing and as required for compliance with test requirements.
- B. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If pressure classifications are no indicated, test entire system at maximum system design pressure. Do not pressurize system above maximum design operating pressure.
- C. Determine leakage from entire system or section of system by relating leakage to surface area of test section.
- D. Maximum Allowable Leakage: Comply with requirements for Leakage Classification 2 for round ducts, Leakage Classification 12 for rectangular ducts in pressure classifications less than and equal to 2-inch wg (500 Pa) (both positive and negative pressures), and Leakage Classification 6 for pressure classifications from 2- to 10-inch wg (500 to 2490 Pa).
- E. Remake leaking joints and retest until leakage is less than maximum allowable.

F. Leakage Test: Perform tests according to SMACNA's "HVAC Air Duct Leakage Test Manual".

3.5 ADJUSTING

A. Adjust volume-control dampers in ducts, outlets and inlets to achieve designed airflow.

3.6 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect the system. Vacuum ducts before final acceptance to remove dust and debris.

END OF SECTION 23 31 00

SECTION 23 31 16 - NON-METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - Furnish and install supply air branch duct runouts to diffusers as described in Contract Documents.
- B. Related Sections
 - 1. Section 23 05 00 Common Work Results for HVAC

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Ducts

- 1. Formable, flexible, circular duct which shall retain its cross-section, shape, rigidity, and shall not restrict air flow after bending.
- 2. Insulation Nominal 1-1/2 inches, 3/4 lb/cu ft density fiberglass insulation with air-tight, polyethylene or polyester core, sheathed in seamless vapor barrier jacket factory installed over flexible assembly.
- 3. Assembly, including insulation and vapor barrier, shall meet Class I requirement of NFPA 90A-1989 and be UL 181 rated, with flame spread of 25 or less and smoke developed rating of 50 or under.
- 4. Approved Products -
 - 1. ANCO-FLEX 4625 by Anco Products Inc.
 - 2. PF/UPC #090 by Flex-Aire.
 - 3. RJ-30 by Flexible Air Movers Inc.
 - 4. M-KC Thermaflex by Flexible Technology.
 - 5. Type 4m Insulated by Flexmaster USA Inc.
- B. Cinch Bands Nylon, 3/8 inch removable and reusable type.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct in fully extended condition free of sags and kinks. Maximum length shall be as indicated on the Drawings.
- B. Make duct connections by coating exterior of duct collar for 3 inches with duct sealer and securing duct in place over sheet metal collar with specified cinch bands.

END OF SECTION 23 31 16

SECTION 23 34 16 - CENTRIFUGAL HVAC FANS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install exhaust fans as described in Contract Documents.
- B. Related Sections
 - 1. Section 23 05 00 Common Work Results for HVAC
 - 2. Division 26 Control device and electrical connection

1.2 QUALITY ASSURANCES

A. Requirements of Regulatory Agencies - Bear AMCA seal and UL label.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Ceiling Mounted Exhaust Fans -
 - 1. Acoustically insulated housings. Sound level rating of 4.6 sones maximum for fan RPM and CFM listed on Drawings.
 - 2. Include chatterproof integral back-draft damper with no metal to metal contact.
 - 3. True centrifugal wheels.
 - 4. Entire fan, motor, and wheel assembly shall be easily removable without disturbing housing.
 - 5. Suitably ground motors and mount on rubber-in shear vibration isolators.
 - 6. Provide wall or roof cap, as required.
 - 7. Quality Standards Greenheck SP or Penn Zephyr
 - 8. Approved Manufacturers
 - a. Acme
 - b. Breidert
 - c. Broan
 - d. Carnes
 - e. Cook-Gemini
 - f. Greenheck
 - g. Penn

B. Dryer Exhaust Fans

- 1. ABS PC blend thermoplastic housing
- 2. Direct drive with a totally enclosed split-capacitor type impeller.
- 3. Wheels shall be backward inclined with an inlet venturi.
- 4. Integrated pressure switch.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Anchor fan units securely to structure.

END OF SECTION 23 34 16

SECTION 23 81 43 - AIR SOURCE SPLIT-SYSTEM HEAT PUMPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install condensing units as described in Contract Documents.
- B. Related Sections
 - 1. Section 23 05 00 Common Work Results for HVAC

1.2 SYSTEM DESCRIPTION

A. Performance Requirements - SEER rating as defined by ARI shall be not less than 16.0. HSPF rating shall not be less than 8.50.

1.3 SUBMITTALS

- A. Quality Assurance/Control
 - 1. Equipment check-out sheets.
 - 2. Technician certificate for use of R-410A refrigerants.

1.4 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies - Each unit shall be UL labeled.

1.5 WARRANTY

A. Provide five year warranty on compressors. Warranty time frame shall be five years from date of "start-up". "Start-up" date shall be recorded on warranty certificate for each unit.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Heat Pump Outdoor Units
 - 1. General
 - a. Condensing units shall use R-410A refrigerant.
 - b. Unit cabinets shall be light grey or white in color.
 - c. Provide with front service valves.
 - 2. Condenser Coils
 - a. Aluminum plate fins mechanically bonded to seamless copper tubes or "Spine Fin" trade mark system which has aluminum fins epoxy bonded to aluminum tubes.

3. Fans -

- a. Direct driven propeller upflow type.
- b. Fan motor shall be single or two speed, thermostatically controlled, permanently lubricated, and designed with permanent protection.
- c. Motors shall be resiliently mounted.
- d. Fan shall have a safety guard.
- e. Fan shall be statically and dynamically balanced.

4. Compressor -

- a. Hermetic scroll-type design with the following features -
 - 1) Externally mounted brass service valves with charging connections.
 - 2) Crankcase heater.
 - 3) Resilient rubber mounts.
 - 4) Compressor motor overload protection.

5. Controls -

- a. Factory wired and located in separate enclosure.
- b. Factory installed safety devices -
 - 1) High and low pressure cutout
 - 2) Condenser fan motor overload devices
- c. Factory-installed anti-cycle timers to prevent units from starting up again for five minutes after any power interruption.

6. Casing -

- a. Fully weatherproof for outdoor installation. Finish shall be weather resistant.
- b. Openings shall be provided for power and refrigerant connections.
- c. Panels shall be removable for servicing.

7. Expansion Valves -

- a. Stainless steel diaphragm and same refrigerant in thermostatic elements as in system. Externally or internally equalized as required by evaporator/condensing system. Reversible for heat pump operation.
- b. Size valves to provide full rated capacity of cooling coil served.
- c. Furnished by evaporator coil/condensing unit supplier and coordinated to provide bleed holes for system pressure equalization, if required.

8. Approved Manufacturers -

- Carrier
- b. Lennox
- c. Trane

2.2 ACCESSORIES

A. Vibration Isolators - 4" x 4" x 3/4" minimum neoprene type vibration isolation pads

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Set heat pump outdoor units on 4x4 redwood sleepers on vibration isolation pads located at each corner of unit. Provide seismic restraint straps at two opposite corners, as detailed on the Drawings.
- B. Do not use capillary tube and piston type refrigerant metering devices.

3.2 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service
- 1. Heat Pump Outdoor Units shall be started up, checked out and adjusted by Unit Manufacturer's authorized factory trained service mechanic.
- 2. Use equipment check-out sheet provided by Manufacturer. Complete and sign all items on sheet.

END OF SECTION 23 81 43

SECTION 26 01 00

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

1.2 SUMMARY

- A. Drawings are necessarily diagrammatic by their nature and are not intended to show every connection in detail or every pipe or conduit in its exact location. Carefully investigate structural and finish conditions and coordinate the separate trades in order to avoid interference between the various phases of Work. Organize and lay out Work so that it will be concealed in furred chases and suspended ceilings, etc., in finished portions of the building, unless specifically noted to be exposed. Install all Work parallel or perpendicular to building lines unless otherwise noted.
- B. The intent of the Drawings is to establish the types of systems and functions; not to set forth each item essential to the functioning of the system. Install the Work complete, including minor details necessary to perform the function indicated. Review pertinent Drawings and adjust the Work to conditions shown. Where discrepancies occur between Drawings, Specifications, and actual field conditions, immediately notify the Project Manager for interpretations.
- C. Coordinate the actual locations of electrical equipment with building features and equipment as indicated on architectural, structural, and mechanical drawings. Review any proposed changes in electrical wiring devices or equipment location with the Project Manager. Project Manager may direct relocation of electrical equipment installation, up to five (5) feet from the position indicated, without additional cost. Remove and relocate electrical equipment placed in an unsuitable location when requested by the Project Manager, at no additional cost to the Project Manager.
- D. All dimensional information related to new structures shall be taken from the appropriate Drawings. All dimensional information related to existing facilities shall be taken from actual measurements made by the Contractor on the Site.
- E. Existing Structures: The building floor slabs, structure, and outer walls are generally existing to remain. The only existing penetrations are openings where indicated on the Drawings. This Contract requires the Contractor to core drill all other floor or wall penetrations as required. All floor penetrations shall include a sleeve that extends two (2) inches above the floor.

1.3 REFERENCE STANDARDS

- A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
- B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

C. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the Contract Documents.

1.4 DEFINITIONS

- A. Concealed: Concealed areas are those areas that cannot be seen by building occupants.
- B. Exposed: Exposed areas are all areas that are exposed to view by building occupants, including inside all equipment rooms, and areas outside the building exterior envelope, exposed to the outdoors.

1.5 QUALITY ASSURANCE

- A. Regulations: Work, materials and equipment shall comply with the latest rules and regulations specified in National Fire Protection Association (NFPA), National Electrical Code (NEC) and California Electrical Code (CEC).
- B. Discrepancies: The Drawings and Specifications are intended to comply with listed codes, ordinances, regulations and standards. Where discrepancies occur, immediately notify the Project Manager in writing and ask for an interpretation. Should installed materials or workmanship fail to comply, the Contractor is responsible for correcting the improper installation at no additional cost to the Project Manager. Additionally, where sizes, capacities, or other such features are required in excess of minimum code or standards requirements, provide those specified or shown.
- C. Contractor Qualifications: An acceptable Contractor for the Work under this Division must have personnel with experience, training and skill to provide a practical working system. The Contractor shall furnish acceptable evidence of having installed not less than three systems of size and type comparable to this Project. All personnel installing equipment under this Division shall possess valid City of Northridge and State of California licenses for their skill level. Each Journeyman shall supervise no more than two apprentice helpers.

1.6 SUBMITTALS

- A. Product Data: Provide coordination Drawings with submittals as required.
- B. Record Documents: In addition to hard copy format, all material submitted as final record products, including approved Shop Drawings and submittals, shall be submitted to the Project Manager in its original electronic file format on compact disc or DVD. Material may be scanned into electronic file format where necessary.

1.7 DELIVERY, STORAGE AND HANDLING

- A. All equipment and materials shall be delivered to the Project Site clean and sealed for protection.
- B. Moisture: During construction, protect switchgear, transformers, motors, control equipment, and other items from insulation moisture absorption and metallic component corrosion by appropriate use of strip heaters, lamps or other suitable means. Apply protection immediately upon receiving the products and maintain continually.
- C. Damage: Take such precautions as are necessary to protect apparatus and materials from damage. Failure to protect materials is sufficient cause for rejection of the apparatus or material in question.
- D. Finish: Protect factory finish from damage during construction operations until acceptance of the Project. Restore any finishes that become stained or damaged to Project Manager's satisfaction.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.
- B. Equipment and control systems should match, integrate, communicate or cooperate with building's existing systems, such as power motor control centers, switchgears, and breakers.
- C. Conditions: Provide new products of manufacturers regularly engaged in production of such equipment. Provide the manufacturer's latest standard design for the type of product specified. Products shall be U.S. made. Project Manager reserves the right to approve or disapprove foreign-made products.
- D. NEC, CEC, and UL: Products shall conform to requirements of the National and California Electrical Code. Where Underwriters' Laboratories have set standards, listed products and issued labels, products used shall be listed and labeled by UL.
- E. Space Limitations: Equipment selected shall conform to the building features and shall be coordinated with all components. Do not provide equipment that will not meet arrangement and space limitations. Contractor shall submit area layouts with submitted items shown drawn to scale. Submittals will be rejected without floor plan Drawings showing submitted items.
- F. Factory Finish: Equipment shall be delivered with a hard surface, factory-applied finish so that no additional field painting is required except for touch-up.

2.2 EQUIPMENT AND DEVICE MARKING

- A. Designations: Externally mark all equipment, devices, feeders, branch circuits and similar items with nameplates with the same designations as indicated on the Contract Documents.
- B. Nameplates shall be black laminated rigid phenolic with white core. Emergency nameplates shall be red laminated phenolic with white cores. Hospital and patient care occupancies with three essential branches on emergency generator shall utilize yellow (life safety), blue (critical), and green (equipment) colors for nameplates. Yellow nameplates shall have black lettering. Nameplate minimum size shall be 1 inch high by 3 inches long with 3/16 inch high engraved white letters. Supply blank nameplates for spare units and spaces.
- C. Nameplate Fasteners: Fasten nameplates to the front of equipment only by means of stainless steel self-tapping screws. Stick-ons or adhesives are not acceptable unless the NEMA enclosure rating is compromised, then only epoxy adhesive shall be used to attach nameplates.
- D. Nameplate Information: The general naming convention shall consist of the following segments:
 - 1. Building name in abbreviated form where equipment is located;
 - 2. Building floor where electrical equipment is located;
 - 3. Electrical system type: NP (normal power), EP (emergency power).
 - 4. System voltage: (120/208V);
 - 5. Individual equipment identification: A, B, C, etc.
- E. In general, provide the following information for the types of electrical equipment as listed:

- 1. Switchgears, Switchboards, Distribution Panels and Motor Control Centers: On mains, identify the piece of equipment, the source, and voltage characteristics (i.e., 120/208\/ 3PH 4W). For each branch circuit protective device, identify the load served.
- 2. Individual Starters, Contactors, Disconnect Switches, and Similar Equipment: Identify the device designation, voltage characteristics source and load served.
- 3. Panelboards: Identify panelboard designation, voltage characteristics, and source designation.
- F. Panelboards: Prepare a neatly typed circuit directory behind clear heat-resistant plastic in a metal frame tack welded to the inside of the door for each panelboard. Identify circuits by equipment served and by building room numbers where room numbers exist. Indicate spares and spaces with light, erasable pencil marking. Adhesive mounted directory pocket is not acceptable. Removing and attaching panel schedules from the Drawings is not acceptable.
- G. Panelboards, Pull, Junction and Outlet Boxes:
 - 1. With ½ inch high permanent lettering, identify conduits connected to panelboards, pull, junction and outlet boxes with the complete circuit number of the conductors contained therein. Neutral conductors shall be identified by wire marker tags in the panelboards, pull, junction and outlet boxes. Where multiple circuits are contained in a box, identify the circuit conductors with permanent tags which indicate circuit designation.
 - 2. Emergency circuits (only) shall be marked in red boxes and covers and circuit designation marked on the face.
- H. Power receptacles, wall switches and dedicated outlets. Identify circuits as per Specification Section 26 27 26.
- I. Dedicated outlets: Dedicated is understood to be specific equipment listed by equipment number in the panel schedules or identified on the Drawings.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Unless otherwise noted, remove all electrical materials and equipment from areas indicated for demolition. Removal of equipment shall not interfere with existing operations.
- B. Remove conduit and wire back to panelboards or to nearest junction box that is not being removed and needs to remain in service. Wire shall be removed back to point of origin. Turn off circuit breakers or switches serving abandoned circuits and tag breaker or switch and label in panel schedule as "Spare".
- C. Materials and equipment to be removed, except items specifically noted to be relocated or delivered to the Project Manager, become property of the Contractor and shall be immediately removed from the Project Site. If the Project Manager identifies other items during construction, those items become Project Manager property and will be turned over to the Project Manager.
- D. Electrical services and controls to items being removed shall be disconnected and removed from the Project Site.
- E. Contractor shall ensure that light switches within the Work area remain operational. Where temporary 120 volt light strings are installed, a switch shall be provided for the light strings near the Project entry door.

3.2 INSTALLATION

- A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
- B. Installation shall be in accordance with manufacturer's published recommendations.
- C. Cooperation with Other Trades: Cooperate with trades of adjacent, related or affected materials or operations, and with trades performing continuations of this Work in order to effect timely and accurate placing of Work and to coordinate, in proper and correct sequence, the Work of such trades.
- D. Workmanship: Work shall be performed by competent workers skilled in their trade. This installation must be complete.
- E. Setting of Equipment: Equipment must be leveled and set plumb. Sheet metal enclosures mounted against a wall must be separated from the wall not less than 1/4 inch by means of corrosion-resistant spacers or by 3 inches of air for freestanding units. Use corrosion resistant bolts, nuts and washers to anchor equipment. Provide Drawings and layout Work showing exact size and location of sleeves, openings or inserts for electrical equipment in slabs, walls, partitions and chases in sufficient time to be coordinated with Work under other divisions.
- F. Sealing of Equipment: Seal openings into equipment to prevent entrance of animals, birds and insects.
- G. Motors: Electrical Work includes the electrical connection of all motors, except those that are wired as a part of equipment.
- H. Concealed Work: Conceal all electrical Work in walls, floors, chases, under floors, underground, and above ceilings except:
 - 1. Where shown or specified to be exposed. Exposed is open to view.
 - 2. Where exposure is necessary to the proper function.
 - 3. Where size of materials and equipment preclude concealment.
- I. Application: Unless otherwise indicated, power will be utilized as follows:
 - 1. 208 volts, three phase: Motors ¾ horsepower and larger.
 - 2. 120 volts, single phase: Incandescent lighting and fluorescent task lighting.
 - 3. 120 volts, single phase: Convenience outlets.
- J. Provide final electrical connections to equipment furnished under other divisions and by the Project Manager. Furnish detailed Shop Drawings of equipment indicating the exact number and location of rough-in points. Such final Shop Drawings may indicate adjustments in total number and exact location of rough-in points, and in equipment dimensions. Making adjustments to field conditions is considered a part of the Work required.
 - 1. Roughing-in: When roughing-in electrical branch circuits to various items of equipment, terminate at proper points as indicated on detailed equipment Shop Drawings or as directed by Project Manager. Do not rely on Drawings accompanying these Specifications for rough-in locations, only for general routing of circuiting.
 - 2. Final Connections: Provide branch circuit connections to meet service fitting requirements.

- K. Refer to Divisions 07 and 09 for sealing and firestopping requirements where raceways penetrate smoke, fire, and sound rated walls.
- L. All unused openings in new and existing such as but not limited to, knockouts on panels and boxes, surface wireway openings, busway openings, circuit breaker empty slots shall be covered with approved cover plates.
- M. All electrical equipment, fittings and connections installed outdoors shall be weatherproof NEMA 3 Construction Standards.

3.3 TESTING

A. Test Conditions:

- Place circuits and equipment into service under normal conditions, collectively and separately, as may be necessary to determine satisfactory operation. Perform specified tests in the presence of the Project Manager's representative(s). Furnish all instruments, wiring, equipment and personnel required for conducting tests. Demonstrate that the equipment operates in accordance with requirements of the Contract Documents. Special tests on certain items are specified hereinafter.
- 2. Where specified that the testing be performed by an independent testing company, an Project Manager-approved National Electrical Testing Association (NETA) certified testing company shall be used. Submit copies of test reports.
- 3. Prior to testing, Contractor shall submit to Project Manager for approval, installation verification Prefunctional Checklists and Functional Performance Test procedures. These shall be used for documentation as part of the commissioning process.
- 4. All instruments required for conducting the tests shall be NIST (National Institute for Standard and Technology) certified or traceable, and calibrated at the time of testing.
- B. Test Dates: Schedule final acceptance sufficiently in advance of the Contract date to permit completion of any necessary adjustment or alterations within the number of days allotted for completion of the Contract. Provide written notification to Project Manager at least fourteen (14) calendar days in advance of Functional Performance Test dates.
- C. Retests: If retesting is required due to initial failure, conduct retests of such time duration as may be necessary to assure proper functioning of adjusted or altered parts or items of equipment. Any resultant delay as a result of such necessary retests does not relieve the Contractor of Contractor's responsibility under this Contract.
- D. Circuit Verification: All 120-volt single-phase circuits shall be verified to match the Drawings and panel schedules by "ringing out" each circuit in the presence of the Project Manager's representative(s).

END OF SECTION 26 01 00

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 07, 08, 27, 28 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Electrical equipment coordination and installation.
 - 2. Sleeves for raceways and cables.
 - 3. Sleeve seals.
 - 4. Grout.
 - 5. Common electrical installation requirements.

1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For sleeve seals.

1.5 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
 - To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - 3. To allow right of way for piping and conduit installed at required slope.
 - 4. So connecting raceways and cables will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

- C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08, Section 083113, "Access Doors and Frames."
- D. Coordinate sleeve selection and application with selection and application of fire-stopping specified in Division 07, Section 078413, "Penetration Fire-stopping."

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral water-stop, unless otherwise indicated.

2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Pressure Plates: Stainless steel. Include two for each sealing element.
 - 3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

B. Non-metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, non-metallic aggregate grout, non-corrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways or cables penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with fire-stop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- G. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07, Section 079200, "Joint Sealants."
- I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with fire-stop materials. Comply with requirements in Division 07, Section 078413, "Penetration Fire-stopping".
- J. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- K. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRE-STOPPING

A. Apply fire-stopping material to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Fire-stopping materials and installation requirements are specified in Division 07, Section 078413, "Penetration Fire-stopping."

END OF SECTION 260500

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.
- B. Related Sections include the following:
 - 1. Division 26 Section "Medium-Voltage Cables" for single-conductor and multiconductor cables, cable splices, and terminations for electrical distribution systems with 2001 to 35,000 V.

1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control test reports.

1.6 QUALITY ASSURANCE

A. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Alcan Products Corporation; Alcan Cable Division.
 - 2. American Insulated Wire Corp.; a Leviton Company.
 - 3. General Cable Corporation.
 - 4. Senator Wire & Cable Company.
 - 5. Southwire Company.
- B. Copper Conductors: Comply with NEMA WC 70.
- C. Conductor Insulation: Comply with NEMA WC 70 for Types THW, THHN-THWN and XHHW.
- D. Multiconductor Cable: Comply with NEMA WC 70 for metal-clad cable, Type MC mineral-insulated, metal-sheathed cable and Type MI nonmetallic-sheathed cable, Type NM with ground wire.

2.2 CONNECTORS AND SPLICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Hubbell Power Systems, Inc.
 - 3. O-Z/Gedney; EGS Electrical Group LLC.
 - 4. 3M; Electrical Products Division.
 - 5. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS
 - A. Service Entrance: Type THHN, single conductors in raceway.
 - B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
 - C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-THWN, single conductors in raceway Metal-clad cable, Type MC and Nonmetallic-sheathed cable, Type NM.

- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-THWN, single conductors in raceway Metal-clad cable, Type MC or Nonmetallic-sheathed cable, Type NM.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Metal-clad cable, Type MC Nonmetallic-sheathed cable, Type NM.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."
- F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

3.7 FIELD QUALITY CONTROL

- A. Testing: Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors, and conductors feeding the following critical equipment and services for compliance with requirements.
 - a. Test feeders to individual disconnect switch.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- C. Test Reports: Prepare a written report to record the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 260519

SECTION 26 05 23

CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. UTP cabling.
 - 2. RS-232 cabling.
 - 3. RS-485 cabling.
 - 4. Identification products.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. IDC: Insulation displacement connector.
- C. Open Cabling: Passing telecommunications cabling through open space (e.g., between the studs of a wall cavity).
- D. RCDD: Registered Communications Distribution Designer.
- E. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.
- C. Source quality-control reports.
- D. Field quality-control reports.
- E. Maintenance Data: For wire and cable to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of an NRTL.

- 1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 - 1. Test each pair of UTP cable for open and short circuits.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install UTP cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PATHWAYS

- A. Support of Open Cabling: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
 - 1. Support brackets with cable tie slots for fastening cable ties to brackets.
 - 2. Lacing bars, spools, J-hooks, and D-rings.
 - 3. Straps and other devices.
- B. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."
 - 1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

2.2 BACKBOARDS

A. Description: Plywood, fire-retardant treated, size indicated on plans. Comply with requirements for plywood backing panels in Division 06 Section "Rough Carpentry."

2.3 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1. Belden CDT Inc.; Electronics Division.
- 2. Berk-Tek; a Nexans company.
- 3. CommScope, Inc.
- 4. Draka USA.
- 5. Genesis Cable Products; Honeywell International, Inc.
- 6. KRONE Incorporated.
- 7. Mohawk; a division of Belden CDT.
- 8. Nordex/CDT; a subsidiary of Cable Design Technologies.
- 9. Superior Essex Inc.
- 10. SYSTIMAX Solutions; a CommScope, Inc. brand.
- 11. 3M
- 12. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
- B. Description: 100-ohm, four-pair UTP.
 - 1. Comply with ICEA S-90-661 for mechanical properties.
 - 2. Comply with TIA/EIA-568-B.1 for performance specifications.
 - 3. Comply with TIA/EIA-568-B.2, Category 6.
 - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - a. Communications, General Purpose: Type CM or Type CMG.
 - b. Communications, Plenum Rated: Type CMP, complying with NFPA 262.
 - c. Communications, Riser Rated: Type CMR; complying with UL 1666.
 - d. Communications, Limited Purpose: Type CMX.
 - e. Multipurpose, Plenum Rated: Type MPP, complying with NFPA 262.

2.4 UTP CABLE HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Technology Systems Industries, Inc.
 - 2. Dynacom Corporation.
 - 3. Hubbell Premise Wiring.
 - 4. KRONE Incorporated.
 - 5. Leviton Voice & Data Division.
 - 6. Molex Premise Networks; a division of Molex, Inc.
 - 7. Nordex/CDT; a subsidiary of Cable Design Technologies.
 - 8. Panduit Corp.
 - 9. Siemon Co. (The).
 - 10. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
- B. UTP Cable Connecting Hardware: IDC type, using modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of the same category or higher.
- C. Connecting Blocks: 110 style for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare; integral with connector bodies, including plugs and jacks where indicated.

2.5 RS-232 CABLE

- A. Standard Cable: NFPA 70, Type CM.
 - 1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.

- 2. Polypropylene insulation.
- 3. Individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage.
- 4. PVC jacket.
- 5. Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned-copper drain wire.
- 6. Flame Resistance: Comply with UL 1581.
- B. Plenum-Rated Cable: NFPA 70, Type CMP.
 - 1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.
 - 2. Plastic insulation.
 - 3. Individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage.
 - 4. Plastic jacket.
 - 5. Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned-copper drain wire.
 - 6. Flame Resistance: Comply with NFPA 262.

2.6 RS-485 CABLE

- A. Standard Cable: NFPA 70, Type CM.
 - 1. Paired, two pairs, twisted, No. 22 AWG, stranded (7x30) tinned-copper conductors.
 - 2. PVC insulation.
 - 3. Unshielded.
 - 4. PVC jacket.
 - 5. Flame Resistance: Comply with UL 1581.
- B. Plenum-Rated Cable: NFPA 70, Type CMP.
 - 1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.
 - 2. Fluorinated ethylene propylene insulation.
 - 3. Unshielded.
 - 4. Fluorinated ethylene propylene jacket.
 - 5. Flame Resistance: NFPA 262, Flame Test.

2.7 IDENTIFICATION PRODUCTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Brady Corporation.
 - 2. HellermannTyton.
 - 3. Kroy LLC.
 - 4. Panduit Corp.
- B. Comply with UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- C. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

2.8 SOURCE QUALITY CONTROL

- A. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.
- B. Factory test UTP cables according to TIA/EIA-568-B.2.

- C. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.
- D. Cable will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 INSTALLATION OF PATHWAYS

- A. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.
- B. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.
- C. Install manufactured conduit sweeps and long-radius elbows if possible.
- D. Pathway Installation in Equipment Rooms:
 - 1. Position conduit ends adjacent to a corner on backboard if a single piece of plywood is installed or in the corner of room if multiple sheets of plywood are installed around perimeter walls of room.
 - 2. Install cable trays to route cables if conduits cannot be located in these positions.
 - 3. Secure conduits to backboard if entering room from overhead.
 - 4. Extend conduits **3 inches** above finished floor.
 - 5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.
- E. Backboards: Install backboards with long dimension vertical.

3.2 INSTALLATION OF CONDUCTORS AND CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
 - 1. Comply with TIA/EIA-568-B.1.
 - 2. Comply with BICSI ITSIM. Ch. 6. "Cable Termination Practices."
 - 3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
 - 4. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 5. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
 - 6. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 - 7. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 - 8. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

- 1. Comply with TIA/EIA-568-B.2.
- 2. Install 110-style IDC termination hardware unless otherwise indicated.
- 3. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

D. Installation of Control-Circuit Conductors:

1. Install wiring in raceways. Comply with requirements specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

E. Open-Cable Installation:

- 1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
- 2. Suspend copper cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than **60 inches** apart.
- 3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

F. Separation from EMI Sources:

- 1. Comply with BICSI TDMM and TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
- 2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
- 3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
- 4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
- 5. Separation between Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.3 REMOVAL OF CONDUCTORS AND CABLES

A. Remove abandoned conductors and cables.

3.4 CONTROL-CIRCUIT CONDUCTORS

- A. Minimum Conductor Sizes:
 - 1. Class 1 remote-control and signal circuits, No 14 AWG.
 - 2. Class 2 low-energy, remote-control, and signal circuits, No. 16 AWG.

3.5 FIRESTOPPING

- A. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
- B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.6 GROUNDING

- A. For data communication wiring, comply with ANSI-J-STD-607-A and with BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. For low-voltage wiring and cabling, comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems."

3.7 IDENTIFICATION

A. Identify system components, wiring, and cabling according to TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Visually inspect UTP and optical fiber cable jacket materials for UL or third-party certification markings. Inspect cabling terminations to confirm color-coding for pin assignments, and inspect cabling connections to confirm compliance with TIA/EIA-568-B.1.
 - 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 - 3. Test UTP cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not after cross connection.
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
- C. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in BICSI TDMM as a guide, or transfer the data from the instrument to the computer, save as text files, print, and submit.

- D. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION 260523

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Grounding systems and equipment.
- B. Section includes grounding systems and equipment, plus the following special applications:
 - 1. Underground distribution grounding.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
 - 1. Ground rods.
 - 2. Grounding arrangements and connections for separately derived systems.
- C. Qualification Data: For qualified testing agency and testing agency's field supervisor.
- D. Field quality-control reports.
- E. Operation and Maintenance Data: For grounding to include in operation and maintenance manuals. Include the following:
 - 1. Instructions for periodic testing and inspection of grounding features at grounding connections for separately derived systems based on NFPA 70B.
 - a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
 - b. Include recommended testing intervals.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - Stranded Conductors: ASTM B 8.
 - 3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Bare Grounding Conductor:
 - 1. No. 4 AWG minimum, soft-drawn copper.
- D. Grounding Bus: Predrilled rectangular bars of annealed copper, **1/4 by 4 inches** in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 5/8 by 96 inches in diameter.
- B. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts.
 - 1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches long.
 - 2. Backfill Material: Electrode manufacturer's recommended material.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches below grade.
- C. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
 - 4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.
 - 6. Flexible raceway runs.
 - 7. Armored and metal-clad cable runs.
- C. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
 - 1. For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 - 2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch grounding bus.
 - 3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

D. Grounding and Bonding for Piping:

- 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
- 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
- E. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.
- F. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
 - 1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
 - 2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

3.4 LABELING

A. Comply with requirements in Division 26 Section "Identification for Electrical Systems" Article for instruction signs. The label or its text shall be green.

- B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.
 - 1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
 - 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 - 2. Pad-Mounted Equipment: 5 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.
- B. Related Sections include the following:
 - 1. Division 26 Section "Vibration And Seismic Controls For Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 SUBMITTALS

A. Product Data: For the following:

- 1. Steel slotted support systems.
- B. Welding certificates.

1.6 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
- B. Comply with NFPA 70.

1.7 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - g. Wesanco, Inc.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

- a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
 - 5)
- 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
- 3. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
- 4. Toggle Bolts: All-steel springhead type.
- 5. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps and single-bolt conduit clamps using spring friction action for retention in support channel.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 3. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

3.3 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base.
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 09 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Identification for raceways.
- 2. Identification of power and control cables.
- 3. Identification for conductors.
- 4. Underground-line warning tape.
- 5. Warning labels and signs.
- 6. Instruction signs.
- 7. Equipment identification labels.
- 8. Miscellaneous identification products.

1.3 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Colors for Raceways Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- high letters on 20-inch centers.
- D. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- E. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- G. Tape and Stencil for Raceways Carrying Circuits More Than 600 V: 4-inch- wide black stripes on 10-inch centers diagonally over orange background that extends full length of raceway or duct and is 12 inches wide. Stop stripes at legends.
- H. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- I. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- D. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.
- E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.3 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- D. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- E. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.4 UNDERGROUND-LINE WARNING TAPE

A. Tape:

- 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
- 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
- 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

- 1. Comply with ANSI Z535.1 through ANSI Z535.5.
- 2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE,.
- 3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE,

C. Tag: Type I:

- 1. Pigmented polyolefin, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
- 2. Thickness: 4 mils.
- 3. Weight: 18.5 lb/1000 sq. ft..
- 4. 3-Inch Tensile According to ASTM D 882: 30 lbf, and 2500 psi.

2.5 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Baked-Enamel Warning Signs:
 - 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - 2. 1/4-inch grommets in corners for mounting.
 - 3. Nominal size, 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:

- 1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
- 2. 1/4-inch grommets in corners for mounting.
- 3. Nominal size, 10 by 14 inches.
- E. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER ELECTRICAL SHOCK HAZARD EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING OSHA REGULATION AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.6 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
 - 1. Engraved legend with black letters on white face.
 - 2. Punched or drilled for mechanical fasteners.
 - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.7 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- B. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.8 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 - 3. Temperature Range: Minus 40 to plus 185 deg F.
 - 4. Color: Black except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 - 3. Temperature Range: Minus 40 to plus 185 deg F.
 - 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
 - 3. UL 94 Flame Rating: 94V-0.
 - 4. Temperature Range: Minus 50 to plus 284 deg F.
 - 5. Color: Black.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- E. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- F. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
- H. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 10-foot maximum intervals.
- B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- C. Power-Circuit Conductor Identification, More than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic plastic tag holder with adhesive-backed phase tags, and a separate tag with the circuit designation.

- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.
- F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
 - 1. Limit use of underground-line warning tape to direct-buried cables.
 - 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- H. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- I. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Controls with external control power connections.
- J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- K. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
 - 1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - c. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be engraved, laminated acrylic or melamine label.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.
- d. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- e. Enclosed switches.
- f. Enclosed circuit breakers.
- g. Enclosed controllers.

END OF SECTION 260553

SECTION 26 09 23

LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Time switches.
 - 2. Photoelectric switches.
 - 3. Lighting contactors.
- B. Related Requirements:
 - Division 26 Section "Wiring Devices" for wall-switch occupancy sensors, and manual light switches.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lighting control device to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper Industries, Inc.
 - 2. Intermatic, Inc.
 - 3. Invensys Controls.
 - 4. Leviton Mfg. Company Inc.
 - 5. NSi Industries LLC; TORK Products.
 - 6. Tyco Electronics; ALR Brand.

- B. Electromechanical-Dial Time Switches: Comply with UL 917.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Contact Configuration: SPST and DPST.
 - 3. Contact Rating: 30-A inductive or resistive, 240-V ac and 20-A ballast load, 120-/240-V ac.
 - 4. Circuitry: Allows connection of a photoelectric relay as a substitute for the on-off function of a program.
 - 5. Astronomic time dial.
 - 6. Eight-Day Program: Uniquely programmable for each weekday and holidays.
 - 7. Skip-a-day mode.
 - 8. Wound-spring reserve carryover mechanism to keep time during power failures, minimum of 16 hours.

2.2 OUTDOOR PHOTOELECTRIC SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Industries, Inc.
 - 2. Intermatic, Inc.
 - 3. NSi Industries LLC; TORK Products.
 - 4. Tyco Electronics; ALR Brand..
- B. Description: Solid state, with SPST and DPST dry contacts rated for 1800 VA, to operate connected load, complying with UL 773.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range.
 - 3. Time Delay: Thirty-second minimum, to prevent false operation.
 - 4. Lightning Arrester: Air-gap type.
 - 5. Mounting: Twist lock complying with NEMA C136.10, with base.

2.3 LIGHTING CONTACTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allen-Bradley/Rockwell Automation.
 - 2. ASCO Power Technologies, LP; a division of Emerson Electric Co.
 - 3. Eaton Corporation.
 - 4. General Electric Company; GE Consumer & Industrial Electrical Distribution; Total Lighting
 - 5. Square D; a brand of Schneider Electric.
 - 6.
- B. Description: Electrically operated and mechanically held, combination-type lighting contactors with nonfused disconnect, complying with NEMA ICS 2 and UL 508.
 - 1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current).

- 2. Fault Current Withstand Rating: Equal to or exceeding the available fault current at the point of installation.
- 3. Enclosure: Comply with NEMA 250.
- 4. Provide with control and pilot devices as indicated on Drawings, matching the NEMA type specified for the enclosure.

2.4 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 22 AWG. Comply with requirements in Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller thanNo. 14 AWG. Comply with requirements in Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 CONTACTOR INSTALLATION

A. Mount electrically held lighting contactors with elastomeric isolator pads to eliminate structure-borne vibration, unless contactors are installed in an enclosure with factory-installed vibration isolators.

3.2 WIRING INSTALLATION

- A. Wiring Method: Comply with Division 26 Section "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch.
- B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Division 26 Section "Identification for Electrical Systems."
 - 1. Identify controlled circuits in lighting contactors.
 - 2. Identify circuits or luminaires controlled by photoelectric sensors at each sensor.
- B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Lighting control devices will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 260923

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Snap switches.
 - 3. Wall-switch.
 - 4. Communications outlets.
 - 5. Cord and plug sets.
- B. Related Sections include the following:
 - 1. Division 27 Section "Communications Horizontal Cabling" for workstation outlets.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

1.6 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 5351 (single), 5352 (duplex).
 - b. Hubbell; HBL5351 (single), CR5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5381 (single), 5352 (duplex).

2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

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- 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; GF20.
 - b. Pass & Seymour; 2084.

2.4 CORD AND PLUG SETS

- A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 - 1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.
 - 2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.5 SNAP SWITCHES

- A. Comply with NEMA WD 1 and UL 20.
- B. Switches, 120/277 V, 20 A:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 2221 (single pole), 2222 (two pole), 2223 (three way), 2224 (four way).
 - b. Hubbell; CS1221 (single pole), CS1222 (two pole), CS1223 (three way), CS1224 (four way).
 - c. Leviton; 1221-2 (single pole), 1222-2 (two pole), 1223-2 (three way), 1224-2 (four way).
 - d. Pass & Seymour; 20AC1 (single pole), 20AC2 (two pole), 20AC3 (three way), 20AC4 (four way).

2.6 COMMUNICATIONS OUTLETS

- A. Telephone Outlet:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 3560-6.
 - b. Leviton; 40649.
 - 3. Description: Single RJ-45 jack for terminating 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1; complying with Category 6. Comply with UL 1863.

B. TV Outlet:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

- 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 3562.b. Leviton; 40595.
- 3. Description: one Type F coaxial cable connector.

2.7 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
 - 3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, diecast aluminum with lockable cover.

2.8 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
 - 1. Wiring Devices Connected to Normal Power System: Ivory, unless otherwise indicated or required by NFPA 70 or device listing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
 - 1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

- 1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
- 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
- 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

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4. Existing Conductors:

- a. Cut back and pigtail, or replace all damaged conductors.
- b. Straighten conductors that remain and remove corrosion and foreign matter.
- c. Pigtailing existing conductors is permitted provided the outlet box is large enough.

D. Device Installation:

- 1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
- Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
- Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
- 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
- 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
- 6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
- 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
- 8. Tighten unused terminal screws on the device.
- 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

- 1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the left.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

- A. Comply with Division 26 Section "Identification for Electrical Systems."
 - 1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
 - 1. Test Instruments: Use instruments that comply with UL 1436.

2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.

B. Tests for Convenience Receptacles:

- 1. Line Voltage: Acceptable range is 105 to 132 V.
- 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
- 3. Ground Impedance: Values of up to 2 ohms are acceptable.
- 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
- 5. Using the test plug, verify that the device and its outlet box are securely mounted.
- 6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

END OF SECTION 262726

SECTION 26 28 13

FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Cartridge fuses rated 600-V ac and less for use in control circuits enclosed switches switchboards.
- 2. Plug fuses rated 125-V ac and less for use in plug-fuse-type enclosed switches and fuseholders.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material, dimensions, descriptions of individual components, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:
 - 1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.
 - a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
 - b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.
 - Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
 - 3. Current-limitation curves for fuses with current-limiting characteristics.
 - 4. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
 - 5. Coordination charts and tables and related data.
- B. Operation and Maintenance Data: For fuses to include in operation and maintenance manuals. Include the following:
 - 1. Ambient temperature adjustment information.
 - 2. Current-limitation curves for fuses with current-limiting characteristics.
 - 3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
 - 4. Coordination charts and tables and related data.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.
- E. Comply with UL 248-11 for plug fuses.

1.5 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.6 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

1.7 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Bussmann, Inc.
 - 2. Edison Fuse, Inc.
 - 3. Ferraz Shawmut, Inc.
 - 4. Littelfuse, Inc.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

2.3 PLUG FUSES

A. Characteristics: UL 248-11, nonrenewable plug fuses; 125-V ac.

2.4 PLUG-FUSE ADAPTERS

A. Characteristics: Adapters for using Type S, rejection-base plug fuses in Edison-base fuseholders or sockets; ampere ratings matching fuse ratings; irremovable once installed.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.
- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

- A. Cartridge Fuses:
 - 1. Motor Branch Circuits: Class RK5, time delay.
 - 2. Control Circuits: Class CC, time delay.

3.3 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.
- B. Install plug-fuse adapters in Edison-base fuseholders and sockets. Ensure that adapters are irremovable once installed.
- C. Install spare-fuse cabinet(s).

3.4 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Enclosures.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified.

1.5 SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Enclosure types and details for types other than NEMA 250, Type 1.
 - 2. Current and voltage ratings.
 - 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
- B. Qualification Data: For qualified testing agency.

- C. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
- D. Field quality-control reports.
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- E. Manufacturer's field service report.
- F. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. Include the following:
 - Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
 - 2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- B. Comply with NFPA 70.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
 - 2. Altitude: Not exceeding 6600 feet.
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Owner no fewer than (21) twenty one days in advance of proposed interruption of electric service.
 - 2. Indicate method of providing temporary electric service.
 - 3. Do not proceed with interruption of electric service without Owner's written permission.
 - 4. Comply with NFPA 70E.

1.8 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.9 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 - 2. Fuse Pullers: Two for each size and type.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

- 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
- 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
- 3. Isolated Ground Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
- 4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
- 5. Lugs: Compression type, suitable for number, size, and conductor material.
- 6. Service-Rated Switches: Labeled for use as service equipment.

2.2 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.

B. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

- 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
- 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
- 3. Isolated Ground Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
- 4. Lugs: Compression type, suitable for number, size, and conductor material.

2.3 MOLDED-CASE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. General Requirements: MCCB with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.
- C. Features and Accessories:
 - 1. Standard frame sizes and number of poles.
 - 2. Lugs: Compression type, suitable for number, size, trip ratings, and conductor material.
 - 3. Key Interlock Kit: Externally mounted to prohibit switch operation; key shall be removable only when switch is in off position.

2.4 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA 250, to comply with environmental conditions at installed location.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Stainless Steel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
- C. Install fuses in fusible devices.
- D. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Comply with requirements in Division 26 Section "Identification for Electrical Systems."
 - Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.

C. Tests and Inspections:

- 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- 3. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 262816

SECTION 26 51 00

LIGHTING FIXTURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

1.02 SUMMARY

A. This Section specifies requirements for indoor and outdoor lighting fixtures, exit signs, lamps and ballasts.

1.03 REFERENCE STANDARDS

- A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
- B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.
- C. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:
 - 1. NFPA 101 Code for Safety to Life from Fire in Buildings and Structures.
 - 2. NEMA WD1 General-Purpose Wiring Devices.
 - 3. ANSI C82.1 Specification for Fluorescent Lamp Ballasts.
 - 4. ANSI C82.4 Specifications for High-Intensity-Discharge Lamp Ballasts (Multiple Supply Type).
 - 5. NEMA LE H-I-D Lighting System Noise Criterion (LS-NC) Ratings.
 - 6. NFPA 90-A Standard for the Installation of Air-Conditioning and Ventilating Systems
 - 7. ANSI/ASHRAE/IESNA Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings.

1.04 SUBMITTALS

A. Product Data:

1. Submit a 3-ring binder with manufacturer's data on lighting fixtures in booklet form, with a separate sheet for each fixture, assembled by luminaire "type" in alphabetical order, with the proposed fixture and accessories clearly labeled. Ballast and lamp product data shall accompany fixture submittals.

B. Record Documents:

1. Submit dimensioned drawings and performance data including coefficients of utilization, candela distribution, spacing to mounting height ratio, efficiency and visual comfort probability for each fixture, assembled by luminaire type in alphabetical order.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver lighting fixtures individually wrapped in factory-fabricated fiberboard type containers. Parabolic louvers shall be shipped in thermally sealed polyethylene wrapper.
- B. Handle lighting fixtures carefully to prevent breakage, denting and scoring the fixture finish. Do not install damaged lighting fixtures.
- C. Store product in a clean, dry space protected from weather.

1.06 EXTRA MATERIALS

A. Maintenance Stock:

- 1. Furnish a stock of replacement lamps in the original cartons or packing sleeves, amounting to 10 percent (but not less than two (2) lamps in each case) of each type and size lamp used in each fixture type.
- 2. Deliver replacement stock as directed to Owner's storage space

PART 2 - PRODUCTS

2.01 GENERAL

- A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.
- B. Lighting fixtures and accessories shall comply with the design and functional requirements of the Project. Design characteristics shall be as noted in manufacturer's submittal data.
- C. Provide lighting fixtures of the size, type and rating as scheduled, complete with, but not limited to, lamps, lamp holders, reflectors, ballasts, and wiring.

2.02 MANUFACTURERS

- A. Emergency Exit Signs:
 - 1. Lithonia.
 - 2. Surelite.
 - 3. Emergi-Lite.
- B. Lamps:
 - 1. Philips.
 - 2. Osram/Sylvania.
 - 3. General Electric Company.
- C. Ballasts:

- 1. Universal Lighting Technologies.
- 2. Advance.
- 3. Osram/Sylvania.
- 4. Lutron.
- 5. Robertson Transformer.

2.03 INTERIOR LIGHTING FIXTURES

A. Linear Fluorescent Fixtures:

- 1. Lenses shall be minimum 0.140-inch-thick virgin acrylic. Lens pattern shall be KSH 20 or approved substitution.
- 2. Parabolic louvers shall have a low iridescent diffuse silver finish, 3-inch deep, 6-cells per 4-foot lamp.
- 3. Frames shall be flush or regressed, aluminum, steel hinged and equipped with rotary-action cam latches. Spring latches are not acceptable. Frames shall be reversible and capable of latching either side.

B. Compact Fluorescent Fixtures:

- 1. Reflectors shall be clear, with integral white trim ring, unless noted otherwise.
- 2. Open reflectors shall be 7-inch minimum diameter.
- 3. Fixtures installed outdoors and over food handling areas shall be lensed.
- 4. Fixtures installed in shower locations shall be provided with flush type plastic reflector with opal lens.
- C. Incandescent downlight fixtures shall be prewired equipped with integral thermal protection.

2.04 ENVIRONMENTAL ROOMS AND EXTERIOR LIGHTING FIXTURES

- A. Enclosures shall be complete with gaskets to form weatherproof seal and UL approved for wet locations.
- B. Provide low temperature ballasts with reliable starting to 0 degrees F.
- C. In-ground or buried fixture and ballast systems are not approved for use.
- D. Exterior fixtures shall match Owner's existing style and types, soffit, perimeter area lights.

2.05 EMERGENCY EXIT SIGNS

- A. Provide exit signs with red LED illumination.
- B. Exit signs shall have covers that are composed of a black face and body, smooth red diffusion material, with 6 inch-high red letters on black background, directional arrows as indicated. Individual LED's shall not be visible through the diffusion material.

- C. Fixtures shall have minimum five (5) year warranty.
- D. Fixtures shall be UL924 and Energy Star compliant.
- E. Exit signs shall be rated for dual voltage; 120.

2.06 LAMPS

- A. General use incandescent lamps shall be inside frosted type, 130 volts, 750 hour minimum. These lamps shall be of the 'watt-miser' or 'econo-watt' style and in nominal wattages of 34, 52, 67, 90, or 135 sizes. Halogen PAR lamps shall be 130 volts, 2000 hour minimum.
- B. Compact fluorescent lamps shall be twin or double twin tube, 9, 13, 18 or 26 watt T-4, similar to Sylvania CF13DD/827 and CF26DD/827. 'Long' compact fluorescent lamps in nominal 39 and 40 watt sizes are acceptable. Compact fluorescent lamps shall be 2700K color temperature.
- C. Linear fluorescent rapid-start lamps shall be similar to Sylvania "Octron" T-8 lamps (F017/741, F032/741, etc.), minimum CRI of 75. If different lamp manufacturers are submitted, no noticeable difference in color temperature shall be allowed. T-8 fluorescent lamps shall have a color temperature of 4100 K and be specified in 2 foot, 3 foot and 4 foot lengths only. U-bent (6 inch, 3 inch, 1-5/8 inch) and circline lamps are not acceptable.
- D. Metal halide HID lamps shall be clear, unless noted otherwise, with mogul or medium bases. Double-ended lamps are not acceptable. Any base type other than medium or mogul shall be submitted for Owner review and approval in advance. Metal halide fixtures shall be lensed or utilize a lamp (PAR type) which does not require special arc tube protection. Mogul base pulse start lamps are not acceptable.
- E. Cold cathode, neon, T-5 and T-2 systems are not approved for use.
- F. LED, induction and fiber optic lighting systems may be approved for special applications when submitted for Owner review and approval in advance.
- G. Lamps, including linear fluorescent, compact fluorescent and high intensity discharge, shall be low mercury type and shall pass all federal TCLP (Toxicity Characteristic Leaching Procedure) test requirements at the time of manufacture.

2.07 BALLASTS FOR FLUORESCENT T-8 LAMPS

- A. High frequency (20 kHz or greater) electronic type.
- B. THD (total harmonic distortion) of less than 10 percent.
- C. Power factor greater than or equal to 95 percent.
- D. Ballasts shall operate with 265 MA lamps.
- E. Unless noted otherwise (i.e. dual switching, etc.), provide one ballast per fixture.
- F. All ballasts shall be rated 120-volt operation.
- G. Ballasts shall be Class P thermally protected.
- H. Ballasts shall include a 5-year manufacturer's warranty.
- I. Ballasts shall meet FCC requirements governing electromagnetic and radio frequency interference.

2.08 BALLASTS FOR COMPACT FLUORESCENT LAMPS

- A. All ballasts shall be of the high power factor type and be capable of independent switching if two ballasts are provided with a fixture.
- B. Ballasts shall include a 5-year manufacturer's warranty.
- C. Dimming ballasts shall be electronic and compatible for line voltage or control wire dimming systems as specified on the Contract Documents.
- D. Ballasts shall be magnetic for 2-pin lamp application. Electronic ballasts for other applications shall be submitted for Owner approval in advance.

2.09 BALLASTS FOR HID LAMPS

- A. HID ballast shall be of the lead-peak autotransformer type for metal halide lamps. Ballast shall start and operate the lamp at ambient temperatures ranging from minus 20 degrees F to 105 degrees F. All ballasts shall have automatic thermal protection, and high power factor, minimum of 90 percent. Ballasts for interior applications shall be encased and potted, or be of the electronic type.
- B. HID ballasts for M90, M110, M130, M139 and M140 rated lamps shall be electronic, and shall include a five (5) year manufacturer's warranty.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
- B. Install light fixtures in accordance with the manufacturer's written instructions, the applicable requirements of NEC and the National Electrical Contractors Association's "Standard of Installation".
- C. If a fixture type designation is omitted, furnish fixture of the same type as shown for rooms of similar usage. Verify with Owner's Project Manager before purchase and installation.
- D. Check the building electrical system requirements and architectural finishes. Regardless of the catalog number prefixes and suffixes shown, furnish fixtures with the proper trim, frames, supports, hangers, ballasts, voltage rating, and other miscellaneous appurtenances to properly coordinate with Project conditions. Verify with Owner's Project Manager prior to ordering.
- E. Check the type of ceilings to be installed in each room and verify that the recessed light fixtures are proper for the type of ceiling to be installed before ordering fixtures. Provide a frame compatible with the type of ceiling in which the recessed lighting fixture is installed. Refer to the Architectural Room Finish Schedule for the specified ceiling type.
- F. Fixtures shall be securely attached to the ceiling-framing members by mechanical means. Clips identified for use with the type of ceiling framing member(s) and fixture(s) shall also be permitted. Fasten lighting fixtures in areas where there is no ceiling securely to the structure.
- G. Immediately before final observation, clean all fixtures, inside and out, including plastics and glassware, and adjust all trim to properly fit adjacent surface, replace broken or damaged parts, and lamp and test all fixtures for electrical as well as mechanical operation.
- H. Protect installed fixtures from damage during the remainder of the construction period.

I. Wiring methods:

- 1. Lighting fixtures shall be connected to a typical metal conduit, junction box, and wire lighting grid system.
- 2. Modular cabling, flexible whip assemblies, feed through wiring, 'daisy-chain' feeds, tandem wiring and other similar wiring methods are not acceptable for the lighting circuit distribution and wiring system.

3.02 TESTING

- A. Upon completion of installation of interior lighting fixtures, and after circuitry has been energized, apply electrical energy to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at the Project Site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.
- B. Incandescent lamps shall be new at time of Final Completion.
- C. Fluorescent lamps may be used in the final finishing of the Project. Those that have exceeded more than 20 percent of their rated life (as established by Owner records) or that have darkened ends shall be replaced with new lamps before Final Completion.
- D. HID lamps may be used in the final finishing of the Project. Those that have exceeded more than 20 percent of their rated life (as established by Owner records) shall be replaced with new lamps before Final Completion.
- E. All existing fixtures in work area that are re-used or relocated shall be cleaned inside and out, broken or damaged parts replaced and new lamps installed.

3.03 LIGHTING FIXTURE SCHEDULE

A. Refer to Lighting Fixture Schedule on Drawings for list of specified manufacturers for each fixture proposed.

END OF SECTION 26 51 00

SECTION 26 52 00

EMERGENCY LIGHTING

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Emergency lighting units
- B. Emergency LED exit signs
- C. Emergency fluorescent lamp power supplies

1.2 REFERENCES

- A. FS W-L-305 Light Set, General Illumination (Emergency or Auxiliary)
- B. NFPA 101 Code for Safety to Life from Fire in Buildings and Structures
- C. NEMA WD1 General-Purpose Wiring Devices

1.3 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Provide product data on emergency lighting units, exit signs, and emergency fluorescent lamp power supply units.

1.4 COMMISSIONING

- A. Commissioning of a system or systems specified in this section is part of the construction process.
- B. Documentation and testing of these systems, as well as training of the Owner's operation and maintenance personnel, is required in cooperation with the Owner's Representative and the Commissioning Authority.
- Project Closeout is dependent on successful completion of all commissioning procedures, documentation, and issue closure.
- D. Refer to Section 01700 Contract Closeout, for substantial completion details.
- E. Refer to Section 01810, Commissioning, for detailed commissioning requirements.

PART 2 PRODUCTS

2.1 INCANDESCENT EMERGENCY LIGHTING UNITS

- A. Emergency Lighting Unit: Self-contained unit with rechargeable storage batteries, charger, and lamps.
- B. Battery: 6 volt, nickel-cadmium type, with 1.5-hour capacity to supply the connected lamp load.
- C. Charger: Dual-rate charger, capable of maintaining the battery in a full-charge state during normal conditions, and capable of recharging discharged battery to full charged within 12 hours.
- D. Lamps: 8-Watt minimum, sealed beam type PAR 36.
- E. Remote Lamps: Match lamps on unit.
- F. Unit Housing: Steel with bronze hammer tone finish.
- G. Indicators: Provide lamps to indicate AC ON and RECHARGING.
- H. Provide switch to transfer unit from normal supply to battery supply.
- I. Electrical Connection: Knockout for conduit connection.

2.2 SELF-CONTAINED EMERGENCY POWER LED EXIT SIGNS

- A. Type: Exit signs with integral battery-operated emergency power supply, including power failure relay, test switch, AC ON pilot light, battery, and fully-automatic two-rate charger.
- B. Battery: Sealed lead acid or lead calcium cell, requiring no maintenance or replacement for 10 years under normal conditions.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install units plumb and level.
- B. Aim directional lamp heads as directed.

3.1 FUNCTIONAL PERFORMANCE TESTING

- A. System Functional Performance Testing is part of the Commissioning Process.
 - 1. The Contractor shall perform the Functional Performance Testing and the Commissioning Authority shall witness and document the test.
 - Refer to Section 01810, Commissioning, for functional performance tests and commissioning requirements.
- B. Systems Readiness Checklists shall be completed and submitted for each piece of equipment included in this section
- C. Perform the functional performance testing of Panelboards as part of the Emergency Generator System Functional Performance testing.

3.2 DEMONSTRATION AND TRAINING

- A. Training of the Owner's operation and maintenance personnel is required in cooperation with the Owner's Representative.
 - 1. Provide competent, factory authorized personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems.
 - 2. Schedule the instruction in coordination with the Owner's Representative after submission and approval of formal training plans.
 - 3. Refer to Section 01810, Commissioning, for further contractor training requirements.
- B. Provide demonstration and training for all types of emergency lighting installed in this project.

END OF SECTION

SECTION 26 56 00

EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior luminaires with lamps and ballasts.
 - 2. Luminaire-mounted photoelectric relays.
- B. Related Sections:
 - 1. Division 26 Section "Interior Lighting" for exterior luminaires normally mounted on exterior surfaces of buildings.

1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color-rendering index.
- C. LER: Luminaire efficacy rating.
- D. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.4 SUBMITTALS

- A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
 - 2. Photoelectric relays.
 - 3. Ballasts, including energy-efficiency data.
 - 4. Lamps, including life, output, CCT, CRI, lumens, and energy-efficiency data.
- B. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with IEEE C2, "National Electrical Safety Code."
- C. Comply with NFPA 70.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.
 - 1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
 - 2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
 - 3. Warranty Period for Color Retention: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product indicated on Drawings
- B. GENERAL REQUIREMENTS FOR LUMINAIRES
- C. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
 - 1. LER Tests Fluorescent Fixtures: Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
- D. Metal Parts: Free of burrs and sharp corners and edges.
- E. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
- F. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
- G. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.
- H. Exposed Hardware Material: Stainless steel.

- I. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- J. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.
- K. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
- L. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.
- M. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.
- N. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 - 2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - a. Color: As selected from manufacturer's standard catalog of colors.
 - b. Color: Match Architect's sample of manufacturer's standard color.
 - c. Color: As selected by Architect from manufacturer's full range.
- O. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 - 2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
 - 3. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
 - 4. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.
 - a. Color: As indicated on drawings.
- P. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp and ballast characteristics:

- a. "USES ONLY" and include specific lamp type.
- b. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
- c. ANSI ballast type (M98, M57, etc.) for HID luminaires.
- d. CCT and CRI for all luminaires.

2.2 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

- A. Comply with UL 773 or UL 773A.
- B. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay. Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.
 - 1. Relay with locking-type receptacle shall comply with ANSI C136.10.
 - 2. Adjustable window slide for adjusting on-off set points.

2.3 FLUORESCENT BALLASTS AND LAMPS

- A. Ballasts for Low-Temperature Environments:
 - 1. Temperatures 0 Deg F and Higher: electromagnetic type rated for 0 deg F starting and operating temperature with indicated lamp types.
 - 2. Temperatures Minus 20 Deg F and Higher: Electromagnetic type designed for use with indicated lamp types.
- B. Ballast Characteristics:
 - 1. Power Factor: 90 percent, minimum.
 - 2. Sound Rating: Class A.
 - 3. Total Harmonic Distortion Rating: Less than 10 percent.
 - 4. Electromagnetic Ballasts: Comply with ANSI C82.1, energy-saving, high power factor, Class P, automatic-reset thermal protection.
 - 5. Case Temperature for Compact Lamp Ballasts: 65 deg C, maximum.
 - 6. Transient-Voltage Protection: Comply with IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
- C. Low-Temperature Lamp Capability: Rated for reliable starting and operation with ballast provided at temperatures minus 20 deg F and higher.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

- A. Install lamps in each luminaire.
- B. Fasten luminaire to indicated structural supports.
 - 1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

3.2 CORROSION PREVENTION

A. Steel Conduits: Comply with Division 26 Section "Raceway and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.3 GROUNDING

- A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding electrode for each pole unless otherwise indicated.
 - 2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.
- B. Ground nonmetallic poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding electrode for each pole.
 - 2. Install grounding conductor and conductor protector.
 - 3. Ground metallic components of pole accessories and foundations.

3.4 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
 - 1. Verify operation of photoelectric controls.
- C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 265600

SECTION 27 05 11

REQUIREMENTS FOR COMMUNICATIONS INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section, Requirements for Communications Installations, applies to all sections of Division 27.
- B. Furnish and install communications cabling, systems, equipment, and accessories in accordance with the specifications and drawings. Capacities and ratings of transformers, cable, and other items and arrangements for the specified items are shown on drawings.

1.2 MINIMUM REQUIREMENTS

- A. References to industry and trade association standards and codes are minimum installation requirement standards.
- B. Drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the above standards.

1.3 QUALIFICATIONS (PRODUCTS AND SERVICES)

A. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.

B. Product Qualification:

- 1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
- 2. The Government reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.

1.4 MANUFACTURED PRODUCTS

- A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts shall be available.
- B. When more than one unit of the same class of equipment is required, such units shall be the product of a single manufacturer.

C. Equipment Assemblies and Components:

- 1. Components of an assembled unit need not be products of the same manufacturer.
- 2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
- 3. Components shall be compatible with each other and with the total assembly for the intended service.
- 4. Constituent parts which are similar shall be the product of a single manufacturer.

- D. Factory wiring shall be identified on the equipment being furnished and on all wiring diagrams.
- E. When Factory Testing Is Specified:
 - The Government shall have the option of witnessing factory tests. The contractor shall notify the VA
 through the Resident Engineer a minimum of 15 working days prior to the manufacturers making the
 factory tests.
 - 2. Four copies of certified test reports containing all test data shall be furnished to the Resident Engineer prior to final inspection and not more than 90 days after completion of the tests.
 - 3. When equipment fails to meet factory test and re-inspection is required, the contractor shall be liable for all additional expenses, including expenses of the Government.

1.5 EQUIPMENT REQUIREMENTS

Where variations from the contract requirements are requested in accordance with the GENERAL CONDITIONS and Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

1.6 EQUIPMENT PROTECTION

- A. Equipment and materials shall be protected during shipment and storage against physical damage, dirt, moisture, cold and rain:
 - 1. During installation, enclosures, equipment, controls, controllers, circuit protective devices, and other like items, shall be protected against entry of foreign matter; and be vacuum cleaned both inside and outside before testing and operating and repainting if required.
 - 2. Damaged equipment shall be, as determined by the Resident Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.
 - 3. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
 - 4. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

1.7 WORK PERFORMANCE

- A. Job site safety and worker safety is the responsibility of the contractor.
- B. For work on existing stations, arrange, phase and perform work to assure communications service for other buildings at all times. Refer to Article OPERATIONS AND STORAGE AREAS under Section 01 00 00, GENERAL REQUIREMENTS.
- C. New work shall be installed and connected to existing work neatly and carefully. Disturbed or damaged work shall be replaced or repaired to its prior conditions, as required by Section 01 00 00, GENERAL REQUIREMENTS.
- D. Coordinate location of equipment and pathways with other trades to minimize interferences. See the GENERAL CONDITIONS.
- 1.8 EQUIPMENT INSTALLATION AND REQUIREMENTS

- A. Equipment location shall be as close as practical to locations shown on the drawings.
- B. Inaccessible Equipment:
 - 1. Where the Government determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Government.
 - 2. "Conveniently accessible" is defined as being capable of being reached without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

1.9 EQUIPMENT IDENTIFICATION

- A. Install an identification sign which clearly indicates information required for use and maintenance of equipment.
- B. Nameplates shall be laminated black phenolic resin with a white core with engraved lettering, a minimum of 6 mm (1/4 inch) high. Secure nameplates with screws. Nameplates that are furnished by manufacturer as a standard catalog item, or where other method of identification is herein specified, are exceptions.

1.10 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. The Government's approval shall be obtained for all equipment and material before delivery to the job site. Delivery, storage, or installation of equipment or material which has not had prior approval will not be permitted at the job site.
- C. All submittals shall include adequate descriptive literature, catalog cuts, shop drawings, and other data necessary for the Government to ascertain that the proposed equipment and materials comply with specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify equipment being submitted.
- D. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered for approval.
 - 1. Mark the submittals, "SUBMITTED UNDER SECTION".
 - Submittals shall be marked to show specification reference including the section and paragraph numbers.
 - 3. Submit each section separately.
- E. The submittals shall include the following:
 - 1. Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, pictures, nameplate data and test reports as required.
 - 2. Submittals are required for all equipment anchors and supports. Submittals shall include weights, dimensions, center of gravity, standard connections, manufacturer's recommendations and behavior

- problems (e.g., vibration, thermal expansion,) associated with equipment or piping so that the proposed installation can be properly reviewed. //
- Elementary and interconnection wiring diagrams for communication and signal systems, control
 system and equipment assemblies. All terminal points and wiring shall be identified on wiring
 diagrams.
- 4. Parts list which shall include those replacement parts recommended by the equipment manufacturer, quantity of parts, current price and availability of each part.
- F. Manuals: Submit in accordance with Section 01 00 00, GENERAL REQUIREMENTS.
 - Maintenance and Operation Manuals: Submit as required for systems and equipment specified in the
 technical sections. Furnish four copies, bound in hardback binders, (manufacturer's standard binders)
 or an approved equivalent. Furnish one complete manual as specified in the technical section but in no
 case later than prior to performance of systems or equipment test, and furnish the remaining manuals
 prior to contract completion.
 - Inscribe the following identification on the cover: the words "MAINTENANCE AND OPERATION MANUAL," the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment.
 - 3. Provide a "Table of Contents" and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.
 - 4. The manuals shall include:
 - a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.
 - b. A control sequence describing start-up, operation, and shutdown.
 - c. Description of the function of each principal item of equipment.
 - d. Installation and maintenance instructions.
 - e. Safety precautions.
 - f. Diagrams and illustrations.
 - g. Testing methods.
 - h. Performance data.
 - i. Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
 - Appendix; list qualified permanent servicing organizations for support of the equipment, including addresses and certified qualifications.
- G. Approvals will be based on complete submission of manuals together with shop drawings.

- H. After approval and prior to installation, furnish the Resident Engineer with one sample of each of the following:
 - 1. A 300 mm (12 inch) length of each type and size of wire and cable along with the tag from the coils of reels from which the samples were taken.
 - 2. Each type of conduit and pathway coupling, bushing and termination fitting.
 - 3. Raceway and pathway hangers, clamps and supports.
 - 4. Duct sealing compound.

1.11 SINGULAR NUMBER

Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

1.12 TRAINING

- A. Training shall be provided in accordance with Article, INSTRUCTIONS, of Section 01 00 00, GENERAL REQUIREMENTS.
- B. Training shall be provided for the particular equipment or system as required in each associated specification.
- C. A training schedule shall be developed and submitted by the contractor and approved by the Resident Engineer at least 30 days prior to the planned training.

---END---

SECTION 28 05 11

REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section, Requirements for Electronic Safety and Security Installations, applies to all sections of Division 28.
- B. Furnish and install electronic safety and security cabling, systems, equipment and accessories in accordance with the specifications and drawings. Capacities and ratings of, cable and other items and arrangements for the specified items are shown on drawings.

1.2 MINIMUM REQUIREMENTS

- A. References to industry and trade association standards and codes are minimum installation requirement standards.
- B. Drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the above standards.

1.3 QUALIFICATIONS (PRODUCTS AND SERVICES)

A. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.

B. Product Qualification:

- 1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
- 2. The Government reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.
- C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within four hours of receipt of notification that service is needed. Submit name and address of service organizations.

1.4 MANUFACTURED PRODUCTS

- A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts shall be available.
- B. When more than one unit of the same class of equipment is required, such units shall be the product of a single manufacturer.
- C. Equipment Assemblies and Components:
 - 1. Components of an assembled unit need not be products of the same manufacturer.
 - Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
 - 3. Components shall be compatible with each other and with the total assembly for the intended service.
 - 4. Constituent parts which are similar shall be the product of a single manufacturer.
- D. Factory wiring shall be identified on the equipment being furnished and on all wiring diagrams.
- E. When Factory Testing Is Specified:
 - The Government shall have the option of witnessing factory tests. The contractor shall notify the VA
 through the Resident Engineer a minimum of 15 working days prior to the manufacturers making the
 factory tests.
 - 2. Four copies of certified test reports containing all test data shall be furnished to the Resident Engineer prior to final inspection and not more than 90 days after completion of the tests.
 - 3. When equipment fails to meet factory test and re-inspection is required, the contractor shall be liable for all additional expenses, including expenses of the Government.

1.5 EQUIPMENT REQUIREMENTS

Where variations from the contract requirements are requested in accordance with the GENERAL CONDITIONS and Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

1.6 EQUIPMENT PROTECTION

- A. Equipment and materials shall be protected during shipment and storage against physical damage, dirt, moisture, cold and rain:
 - 1. During installation, enclosures, equipment, controls, controllers, circuit protective devices, and other like items, shall be protected against entry of foreign matter; and be vacuum cleaned both inside and outside before testing and operating and repainting if required.
 - 2. Damaged equipment shall be, as determined by the Resident Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.
 - Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
 - 4. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

1.7 WORK PERFORMANCE

- A. Job site safety and worker safety is the responsibility of the contractor.
- B. For work on existing stations, arrange, phase and perform work to assure electronic safety and security service for other buildings at all times. Refer to Article OPERATIONS AND STORAGE AREAS under Section 01 00 00, GENERAL REQUIREMENTS.
- C. New work shall be installed and connected to existing work neatly and carefully. Disturbed or damaged work shall be replaced or repaired to its prior conditions, as required by Section 01 00 00, GENERAL REQUIREMENTS.
- D. Coordinate location of equipment and conduit with other trades to minimize interferences. See the GENERAL CONDITIONS.

1.8 EQUIPMENT INSTALLATION AND REQUIREMENTS

A. Equipment location shall be as close as practical to locations shown on the drawings.

B. Inaccessible Equipment:

- Where the Government determines that the Contractor has installed equipment not conveniently
 accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed
 at no additional cost to the Government.
- "Conveniently accessible" is defined as being capable of being reached without the use of ladders, or
 without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt
 guards, transformers, piping, ductwork, conduit and raceways.

1.9 EQUIPMENT IDENTIFICATION

- A. Install an identification sign which clearly indicates information required for use and maintenance of equipment.
- B. Nameplates shall be laminated black phenolic resin with a white core with engraved lettering, a minimum of 6 mm (1/4 inch) high. Secure nameplates with screws. Nameplates that are furnished by manufacturer as a standard catalog item, or where other method of identification is herein specified, are exceptions.

1.10 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. The Government's approval shall be obtained for all equipment and material before delivery to the job site.
 Delivery, storage or installation of equipment or material which has not had prior approval will not be permitted at the job site.
- C. All submittals shall include adequate descriptive literature, catalog cuts, shop drawings and other data necessary for the Government to ascertain that the proposed equipment and materials comply with specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify equipment being submitted.

- D. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered for approval.
 - 1. Mark the submittals, "SUBMITTED UNDER SECTION______"
 - 2. Submittals shall be marked to show specification reference including the section and paragraph numbers.
 - 3. Submit each section separately.
- E. The submittals shall include the following:
 - Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, pictures, nameplate data and test reports as required.
 - 2. Submittals are required for all equipment anchors and supports. Submittals shall include weights, dimensions, center of gravity, standard connections, manufacturer's recommendations and behavior problems (e.g., vibration, thermal expansion,) associated with equipment or piping so that the proposed installation can be properly reviewed.
 - Elementary and interconnection wiring diagrams for communication and signal systems, control system and equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.
 - 4. Parts list which shall include those replacement parts recommended by the equipment manufacturer, quantity of parts, current price and availability of each part.
- F. Manuals: Submit in accordance with Section 01 00 00, GENERAL REQUIREMENTS.
 - Maintenance and Operation Manuals: Submit as required for systems and equipment specified in the
 technical sections. Furnish four copies, bound in hardback binders, (manufacturer's standard binders)
 or an approved equivalent. Furnish one complete manual as specified in the technical section but in no
 case later than prior to performance of systems or equipment test, and furnish the remaining manuals
 prior to contract completion.
 - 2. Inscribe the following identification on the cover: the words "MAINTENANCE AND OPERATION MANUAL," the name and location of the system, equipment, building, name of Contractor, and

contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment.

3. Provide a "Table of Contents" and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.

4. The manuals shall include:

- Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.
- b. A control sequence describing start-up, operation, and shutdown.
- c. Description of the function of each principal item of equipment.
- d. Installation and maintenance instructions.
- e. Safety precautions.
- f. Diagrams and illustrations.
- g. Testing methods.
- h. Performance data.
- Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
- j. Appendix; list qualified permanent servicing organizations for support of the equipment, including addresses and certified qualifications.
- G. Approvals will be based on complete submission of manuals together with shop drawings.

- H. After approval and prior to installation, furnish the Resident Engineer with one sample of each of the following:
 - 1. A 300 mm (12 inch) length of each type and size of wire and cable along with the tag from the coils of reels from which the samples were taken.
 - 2. Each type of conduit and pathway coupling, bushing and termination fitting.
 - 3. Conduit hangers, clamps and supports.
 - 4. Duct sealing compound.

1.11 SINGULAR NUMBER

Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

1.12 TRAINING

- A. Training shall be provided in accordance with Article, INSTRUCTIONS, of Section 01 00 00, GENERAL REQUIREMENTS.
- B. Training shall be provided for the particular equipment or system as required in each associated specification.
- C. A training schedule shall be developed and submitted by the contractor and approved by the Resident Engineer at least 30 days prior to the planned training.

---END---

SECTION 28 31 00

FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section of the specifications includes the furnishing, installation, and connection of the fire alarm equipment to form a complete coordinated system ready for operation. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, control units, fire safety control devices, annunciators, power supplies, and wiring as shown on the drawings and specified.
- B. Fire alarm systems shall comply with requirements of NFPA 72 unless variations to NFPA 72 are specifically identified within these contract documents by the following notation: "variation". The design, system layout, document submittal preparation, and supervision of installation and testing shall be provided by a technician that is certified NICET level III or a registered fire protection engineer. The NICET certified technician shall be on site for the supervision and testing of the system. Factory engineers from the equipment manufacturer, thoroughly familiar and knowledgeable with all equipment utilized, shall provide additional technical support at the site as required by the Contracting Officer or his authorized representative. Installers shall have a minimum of two years experience installing fire alarm systems.

C. Fire alarm signals:

- 1. Building shall have a general evacuation fire alarm signal in accordance with ASA S3.41 to notify all occupants in the respective building to evacuate.
- D. Alarm signals (by device), supervisory signals (by device) and system trouble signals (by device not reporting) shall be distinctly transmitted to the main fire alarm system control unit located in the electrical room.
- E. The main fire alarm control unit shall automatically transmit alarm signals to a listed central station using a digital alarm communicator transmitter in accordance with NFPA 72.

1.2 SCOPE

- A. All existing fire alarm equipment, wiring, devices and sub-systems that are not shown to be reused shall be removed. All existing fire alarm conduit not reused shall be removed.
- B. A new fire alarm system shall be designed and installed in accordance with the specifications and drawings. Device location and wiring runs shown on the drawings are for reference only unless specifically dimensioned. Actual locations shall be in accordance with NFPA 72 and this specification.
- C. Existing fire alarm bells, chimes, door holders, 120VAC duct smoke detectors, valve tamper switches and waterflow/pressure switches may be reused only as specifically indicated on the drawings and provided the equipment:
 - 1. Meets this specification section
 - 2. Is UL listed or FM approved
 - 3. Is compatible with new equipment being installed
 - 4. Is verified as operable through contractor testing and inspection
 - 5. Is warranted as new by the contractor.

- D. Existing 120 VAC duct smoke detectors, waterflow/pressure switches, and valve tamper switches reused by the Contractor shall be equipped with an addressable interface device compatible with the new equipment being installed.
- E. Existing reused equipment shall be covered as new equipment under the Warranty specified herein.

F. Basic Performance:

- 1. Alarm and trouble signals from each building fire alarm control panel shall be digitally encoded by UL listed electronic devices onto a multiplexed communication system.
- 2. Response time between alarm initiation (contact closure) and recording at the main fire alarm control unit (appearance on alphanumeric read out) shall not exceed five (5) seconds.
- 3. The signaling line circuits (SLC) between building fire alarm control units shall be wired Style 7 in accordance with NFPA 72. Isolation shall be provided so that no more than one building can be lost due to a short circuit fault.
- 4. Initiating device circuits (IDC) shall be wired Style C in accordance with NFPA 72.
- 5. Signaling line circuits (SLC) within buildings shall be wired Style 4 in accordance with NFPA 72. Individual signaling line circuits shall be limited to covering 22,500 square feet of floor space or 3 floors whichever is less.
- 6. Notification appliance circuits (NAC) shall be wired Style Y in accordance with NFPA 72.

1.3 RELATED WORK

- A. Section 01 00 00, GENERAL REQUIREMENTS: Restoration of existing surfaces.
- B. Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES: Procedures for submittals.
- C. Section 07 84 00, FIRESTOPPING: Fire proofing wall penetrations.
- D. Section 08 71 00, DOOR HARDWARE: Combination Closer-Holders.
- E. Section 09 91 00, PAINTING: Painting for equipment and existing surfaces.
- F. Section 21 13 13, WET-PIPE SPRINKLER SYSTEMS: Sprinkler systems.
- G. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements for items which are common to other Division 26 sections.
- H. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits and boxes for cables/wiring.
- I. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW: Cables/wiring.

1.4 SUBMITTALS

A. General: Submit 4 copies and 1 reproducible in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, and Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

B. Drawings:

- 1. Prepare drawings using AutoCAD software and include all contractors information. Bid drawing files on AutoCAD will be provided to the Contractor at the pre-construction meeting. The contractor shall be responsible for verifying all critical dimensions.
- 2. Floor plans: Provide locations of all devices (with device number at each addressable device corresponding to control unit programming), appliances, panels, equipment, junction/terminal cabinets/boxes, risers, electrical power connections, individual circuits and raceway routing, system zoning; number, size, and type of raceways and conductors in each raceway; conduit fill calculations with cross section area percent fill for each type and size of conductor and raceway. Only those devices connected and incorporated into the final system shall be on these floor plans. Do not show any removed devices on the floor plans. Show all interfaces for all fire safety functions.
- 3. Riser diagrams: Provide, for the entire system, the number, size and type of riser raceways and conductors in each riser raceway and number of each type device per floor and zone. Show door holder interface, elevator control interface, HVAC shutdown interface, fire extinguishing system interface, and all other fire safety interfaces. Show wiring Styles on the riser diagram for all circuits. Provide diagrams both on a per building and campus wide basis.
- 4. Detailed wiring diagrams: Provide for control panels, modules, power supplies, electrical power connections, auxiliary relays and annunciators showing termination identifications, size and type conductors, circuit boards, LED lamps, indicators, adjustable controls, switches, ribbon connectors, wiring harnesses, terminal strips and connectors, spare zones/circuits. Diagrams shall be drawn to a scale sufficient to show spatial relationships between components, enclosures and equipment configuration.
- 5. Two weeks prior to final inspection, the Contractor shall deliver to the owner one (1) set of reproducible, as-built drawings. As-built drawings (floor plans) shall show all new and existing conduit used for the fire alarm system.

C. Manuals:

- 1. Submit simultaneously with the shop drawings, companion copies of complete maintenance and operating manuals including technical data sheets for all items used in the system, power requirements, device wiring diagrams, dimensions, and information for ordering replacement parts.
 - a. Wiring diagrams shall have their terminals identified to facilitate installation, operation, expansion and maintenance.
 - b. Wiring diagrams shall indicate internal wiring for each item of equipment and the interconnections between the items of equipment.
 - c. Include complete listing of all software used and installation and operation instructions including the input/output matrix chart.
 - d. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate, inspect, test and maintain the equipment and system. Provide all manufacturer's installation limitations including but not limited to circuit length limitations.
 - e. Complete listing of all digitized voice messages.
 - f. Provide standby battery calculations under normal operating and alarm modes. Battery calculations shall include the magnets for holding the doors open for one minute.

- g. Include information indicating who will provide emergency service and perform post contract maintenance.
- h. Provide a replacement parts list with current prices. Include a list of recommended spare parts, tools, and instruments for testing and maintenance purposes.
- i. A computerized preventive maintenance schedule for all equipment. The schedule shall include the required times for systematic examination, adjustment and cleaning of all equipment. A print out of the schedule shall also be provided in the manual. Provide the disk in a pocket within the manual.
- j. Furnish manuals in 3 ring loose-leaf binder or manufacturer's standard binder.
- k. A print out for all devices proposed on each signaling line circuit with spare capacity indicated.
- 2. Two weeks prior to final inspection, deliver four copies of the final updated maintenance and operating manual to the owner.
 - a. The manual shall be updated to include any information necessitated by the maintenance and operating manual approval.
 - b. Complete "As installed" wiring and schematic diagrams shall be included that shows all items of equipment and their interconnecting wiring. Show all final terminal identifications.
 - c. Complete listing of all programming information, including all control events per device including an updated input/output matrix.
 - d. Certificate of Installation as required by NFPA 72 for each building. The certificate shall identify any variations from the National Fire Alarm Code.
 - e. Certificate from equipment manufacturer assuring compliance with all manufacturers installation requirements and satisfactory system operation.

D. Certifications:

- Together with the shop drawing submittal, submit the technician's NICET level III fire alarm
 certification as well as certification from the control unit manufacturer that the proposed performer of
 contract maintenance is an authorized representative of the major equipment manufacturer. Include in
 the certification the names and addresses of the proposed supervisor of installation and the proposed
 performer of contract maintenance. Also include the name and title of the manufacturer's
 representative who makes the certification.
- 2. Together with the shop drawing submittal, submit a certification from either the control unit manufacturer or the manufacturer of each component (e.g., smoke detector) that the components being furnished are compatible with the control unit.
- 3. Together with the shop drawing submittal, submit a certification from the major equipment manufacturer that the wiring and connection diagrams meet this specification, UL and NFPA 72 requirements.

1.5 WARRANTY

All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of five (5) years from the date of acceptance of the entire installation by the Contracting Officer.

1.6 GUARANTY PERIOD SERVICES

- A. Complete inspection, testing, maintenance and repair service for the fire alarm system shall be provided by a factory trained authorized representative of the manufacturer of the major equipment for a period of five years from the date of acceptance.
- B. Contractor shall provide all necessary test equipment, parts and labor to perform required inspection, testing, maintenance and repair.
- C. All inspection, testing, maintenance and permanent records required by NFPA 72, and recommended by the equipment manufacturer shall be provided by the contractor. Work shall include operation of sprinkler system alarm and supervisory devices as well as all reused existing equipment connected to the fire alarm system. It shall include all interfaced equipment including but not limited to elevators, HVAC shutdown, and extinguishing systems.
- D. Maintenance and testing shall be performed in accordance with NFPA 72. A computerized preventive maintenance schedule shall be provided and shall describe the protocol for preventive maintenance of equipment. The schedule shall include a systematic examination, adjustment and cleaning of all equipment.
- E. Non-included Work: Repair service shall not include the performance of any work due to improper use, accidents, or negligence for which the contractor is not responsible.

F. Emergency Service:

- 1. Warranty Period Service: Service other than the preventative maintenance, inspection, and testing required by NFPA 72 shall be considered emergency call-back service and covered under the warranty of the installation during the first year of the warranty period, unless the required service is a result of abuse or misuse by the owner. Written notification shall not be required for emergency warranty period service and the contractor shall respond as outlined in the following sections on Normal and Overtime Emergency Call-Back Service. Warranty period service can be required during normal or overtime emergency call-back service time periods at the discretion of owner or his authorized representative.
- 2. Normal and overtime emergency call-back service shall consist of an on-site response within two hours of notification of a system trouble.
- 3. Normal emergency call-back service times are between the hours of 7:30 a.m. and 4:00 p.m., Monday through Friday, exclusive of federal holidays. Service performed during all other times shall be considered to be overtime emergency call-back service. The cost of all normal emergency call-back service for years 2 through 5 shall be included in the cost of this contract.
- 4. Overtime emergency call-back service shall be provided for the system when requested by the Owner. The cost of the first 40 manhours per year of overtime call-back service during years 2 through 5 of this contract shall be provided under this contract. Payment for overtime emergency call-back service in excess of the 40 man hours per year requirement will be handled through separate purchase orders. The method of calculating overtime emergency call-back hours is based on actual time spent on site and does not include travel time.
- G. The contractor shall maintain a log at each fire alarm control unit. The log shall list the date and time of all examinations and trouble calls, condition of the system, and name of the technician. Each trouble call shall be fully described, including the nature of the trouble, necessary correction performed, and parts replaced.

H. In the event that owner modifies the fire alarm system post-Acceptance but during the five year Guaranty Period Service period, Contractor shall be required to verify that the system, as newly modified or added, is consistent with the manufacturer's requirements; any verification performed will be equitably adjusted under the Changes clause. The post-Acceptance modification or addition to the fire alarm system shall not void the continuing requirements under this contract set forth in the Guarantee Period Service provision for the fire alarm system as modified or added. The contract will be equitably adjusted under the Changes clause for such additional performance.

1.7 APPLICABLE PUBLICATIONS

- A. The publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. The publications are referenced in text by the basic designation only.
- B. National Fire Protection Association (NFPA):

70-2005	National Electrical Code (NEC).
72-2002	National Fire Alarm Code.
90A-2002	Installation of Air Conditioning and Ventilating Systems.
101-2003	Life Safety Code

C. Underwriters Laboratories, Inc. (UL):

2000-2000.....Fire Protection Equipment Directory

- D. Factory Mutual Research Corp (FM): Approval Guide, 2005 Edition
- F. International Code Council, International Building Code (IBC) 2003 Edition

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS, GENERAL

- A. Existing equipment may be reused only where indicated on the drawings.
- B. Except as indicated in paragraph A above, all equipment and components shall be new and the manufacturer's current model. All equipment shall be tested and listed by Underwriters Laboratories, Inc. or Factory Mutual Research Corporation for use as part of a fire alarm system. The authorized representative of the manufacturer of the major equipment shall certify that the installation complies with all manufacturer's requirements and that satisfactory total system operation has been achieved.

2.2 CONDUIT, BOXES, AND WIRE

- A. Conduit shall be in accordance with Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS and as follows:
 - 1. All new and reused conduit shall be installed in accordance with NFPA 70.
 - 2. Conduit fill shall not exceed 40 percent of interior cross sectional area.
 - 3. All new conduit shall be 19 mm (3/4 inch) minimum.
- B. Wire:

- 1. All existing wiring shall be removed and new wiring installed in a conduit or raceway.
- 2. Wiring shall be in accordance with NEC article 760, Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW), and as recommended by the manufacturer of the fire alarm system. All wires shall be color coded. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG for initiating device circuits and 14 AWG for notification device circuits.
- 3. Addressable circuits and wiring used for the multiplex communication loop shall be twisted and shielded unless specifically excepted by the fire alarm equipment manufacturer in writing.
- 4. Any fire alarm system wiring that extends outside of a building shall have additional power surge protection to protect equipment from physical damage and false signals due to lightning, voltage and current induced transients. Protection devices shall be shown on the submittal drawings and shall be UL listed or in accordance with written manufacturer's requirements.
- 5. All wire or cable used in underground conduits including those in concrete shall be listed for wet locations.
- C. Terminal Boxes, Junction Boxes, and Cabinets:
 - 1. Shall be galvanized steel in accordance with UL requirements.
 - 2. All new and reused boxes shall be sized and installed in accordance with NFPA 70.
 - 3. New and existing covers shall be repainted red in accordance with Section 09 91 00, PAINTING and shall be identified with white markings as "FA" for junction boxes and as "FIRE ALARM SYSTEM" for cabinets and terminal boxes. Lettering shall be a minimum of 19 mm (3/4 inch) high.
 - 4. Terminal boxes and cabinets shall have a volume 50 percent greater than required by the NFPA 70. Minimum sized wire shall be considered as 14 AWG for calculation purposes.
 - 5. Terminal boxes and cabinets shall have identified pressure type terminal strips and shall be located at the base of each riser. Terminal strips shall be labeled as specified or as approved by the OWNER.

2.3 FIRE ALARM CONTROL UNIT

A. General:

- 1. Building shall be provided with a fire alarm control unit and shall operate as a supervised zoned fire alarm system.
- 2. Power source shall be supervised from the other source for loss of power.
- 3. All circuits shall be monitored for integrity.
- 4. Visually and audibly annunciate any trouble condition including, but not limited to main power failure, grounds and system wiring derangement.
- 5. Transmit digital alarm information to the main fire alarm control unit.
- B. Enclosure:

- 1. The control unit shall be housed in a cabinet suitable for both recessed and surface mounting. Cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.
- 2. Cabinet shall contain all necessary relays, terminals, lamps, and legend plates to provide control for the system.

C. Operator terminal at main control unit:

- 1. Operator terminal shall consist of the central processing unit, display screen, keyboard and printer.
- 2. Display screen shall have a minimum 15-inch diagonal non-glare screen capable of displaying 24 lines of 80 characters each.
- 3. Keyboard shall consist of 60 alpha numeric and 12 user/functional control keys.
- 4. Printer shall be the automatic type, printing the date, time and location for all alarm, supervisory, and trouble conditions.

D. Power Supply:

- The control unit shall derive its normal power from a 120 volt, 60 Hz dedicated supply connected to
 the emergency power system. Standby power shall be provided by a 24 volt DC battery as hereinafter
 specified. The normal power shall be transformed, rectified, coordinated, and interfaced with the
 standby battery and charger.
- 2. The door holder power shall be arranged so that momentary or sustained loss of main operating power shall not cause the release of any door.
- 3. Power supply for smoke detectors shall be taken from the fire alarm control unit.
- 4. Provide protectors to protect the fire alarm equipment from damage due to lightning or voltage and current transients.
- 5. Provide new separate and direct ground lines to the outside to protect the equipment from unwanted grounds.
- E. Circuit Supervision: Each alarm initiating device circuit, signaling line circuit, and notification appliance circuit, shall be supervised against the occurrence of a break or ground fault condition in the field wiring. These conditions shall cause a trouble signal to sound in the control unit until manually silenced by an off switch.
- F. Supervisory Devices: All sprinkler system valves, standpipe control valves, post indicator valves (PIV), and main gate valves shall be supervised for off-normal position. Closing a valve shall sound a supervisory signal at the control unit until silenced by an off switch. The specific location of all closed valves shall be identified at the control unit. Valve operation shall not cause an alarm signal. Low air pressure switches and duct detectors shall be monitored as supervisory signals. The power supply to the elevator shunt trip breaker shall be monitored by the fire alarm system as a supervisory signal.

G. Trouble signals:

- 1. Arrange the trouble signals for automatic reset (non-latching).
- 2. System trouble switch off and on lamps shall be visible through the control unit door.

- H. Function Switches: Provide the following switches in addition to any other switches required for the system:
 - 1. Remote Alarm Transmission By-pass Switch: Shall prevent transmission of all signals to the main fire alarm control unit when in the "off" position. A system trouble signal shall be energized when switch is in the off position.
 - 2. Alarm Off Switch: Shall disconnect power to alarm notification circuits on the local building alarm system. A system trouble signal shall be activated when switch is in the off position.
 - 3. Trouble Silence Switch: Shall silence the trouble signal whenever the trouble silence switch is operated. This switch shall not reset the trouble signal.
 - 4. Reset Switch: Shall reset the system after an alarm, provided the initiating device has been reset. The system shall lock in alarm until reset.
 - 5. Lamp Test Switch: A test switch or other approved convenient means shall be provided to test the indicator lamps.
 - 6. Drill Switch: Shall activate all notification devices without tripping the remote alarm transmitter. This switch is required only for general evacuation systems specified herein.
 - 7. Door Holder By-Pass Switch: Shall prevent doors from releasing during fire alarm tests. A system trouble alarm shall be energized when switch is in the abnormal position.
 - 8. Elevator recall By-Pass Switch: Shall prevent the elevators from recalling upon operation of any of the devices installed to perform that function. A system trouble alarm shall be energized when the switch is in the abnormal position.
 - HVAC/Smoke Damper By-Pass: Provide a means to disable HVAC fans from shutting down and/or smoke dampers from closing upon operation of an initiating device designed to interconnect with these devices.

I. Remote Transmissions:

- 1. Provide capability and equipment for transmission of alarm, supervisory and trouble signals to the main fire alarm control unit.
- 2. Transmitters shall be compatible with the systems and equipment they are connected to such as timing, operation and other required features.
- J. Remote Control Capability: Each building fire alarm control unit shall be installed and programmed so that each must be reset locally after an alarm, before the main fire alarm control unit can be reset. After the local building fire alarm control unit has been reset, then the all system acknowledge, reset, silence or disabling functions can be operated by the main fire alarm control unit
- K. System Expansion: Design the control units and enclosures so that the system can be expanded in the future (to include the addition of twenty percent more alarm initiating, alarm notification and door holder circuits) without disruption or replacement of the existing control unit and secondary power supply.

2.4 STANDBY POWER SUPPLY

A. Uninterrupted Power Supply (UPS):

- 1. The UPS system shall be comprised of a static inverter, a precision battery float charger, and sealed maintenance free batteries.
- 2. Under normal operating conditions, the load shall be filtered through a ferroresonant transformer.
- 3. When normal AC power fails, the inverter shall supply AC power to the transformer from the battery source. There shall be no break in output of the system during transfer of the system from normal to battery supply or back to normal.
- 4. Batteries shall be sealed, gel cell type.
- 5. UPS system shall be sized to operate the central processor, CRT, printer, and all other directly connected equipment for five minutes upon a normal AC power failure.

B. Batteries:

- 1. Battery shall be of the sealed, maintenance free type, 24-volt nominal.
- 2. Battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus five minutes of alarm to an end voltage of 1.14 volts per cell, upon a normal AC power failure.
- 3. Battery racks shall be steel with an alkali-resistant finish. Batteries shall be secured in seismic areas 2B, 3, or 4 as defined by the Uniform Building Code.

C. Battery Charger:

- 1. Shall be completely automatic, with constant potential charger maintaining the battery fully charged under all service conditions. Charger shall operate from a 120-volt, 60 hertz emergency power source.
- 2. Shall be rated for fully charging a completely discharged battery within 48 hours while simultaneously supplying any loads connected to the battery.
- 3. Shall have protection to prevent discharge through the charger.
- 4. Shall have protection for overloads and short circuits on both AC and DC sides.
- 5. A trouble condition shall actuate the fire alarm trouble signal.
- 6. Charger shall have automatic AC line voltage regulation, automatic current-limiting features, and adjustable voltage controls.

2.5 ANNUNCIATION

- A. Annunciator, Alphanumeric Type (System):
 - 1. Shall be a supervised, LCD display containing a minimum of two lines of 40 characters for alarm annunciation in clear English text.
 - 2. Message shall identify building number, floor, zone, etc on the first line and device description and status (pull station, smoke detector, waterflow alarm or trouble condition) on the second line.
 - 3. The initial alarm received shall be indicated as such.
 - 4. A selector switch shall be provided for viewing subsequent alarm messages.

- 5. The display shall be UL listed for fire alarm application.
- 6. Annunciators shall display information for all buildings connected to the system. Local building annunciators, for general evacuation system buildings, shall be permitted when shown on the drawings and approved by the OWNER.

B. Printers:

- 1. System printers shall be high reliability digital input devices, UL approved, for fire alarm applications. The printers shall operate at a minimum speed of 30 characters per second. The printer shall be continually supervised.
- 2. Printers shall be programmable to either alarm only or event logging output.
 - a. Alarm printers shall provide a permanent (printed) record of all alarm information that occurs within the fire alarm system. Alarm information shall include the date, time, building number, floor, zone, device type, device address, and condition.
 - b. Event logging printers shall provide a permanent (printed) record of every change of status that occurs within the fire alarm system. Status information shall include date, time, building number, floor, zone, device type, device address and change of status (alarm, trouble, supervisory, reset/return to normal).
- 3. System printers shall provide tractor drive feed pins for conventional fan fold 213 mm x 275 mm (8-1/2" x 11") paper.
- 4. The printers shall provide a printing and non-printing self test feature.
- 5. Power supply for printers shall be taken from and coordinated with the building emergency service.
- 6. Each printer shall be provided with a stand for the printer and paper.
- 7. Spare paper and ribbons for printers shall be stocked and maintained as part of the five (5) year guarantee period services in addition to the one installed after the approval of the final acceptance test.

2.6 ALARM NOTIFICATION APPLIANCES

A. Bells:

- 1. Shall be electric, single-stroke or vibrating, heavy-duty, under-dome, solenoid type.
- 2. Unless otherwise shown on the drawings, shall be 150 mm (6 inches) diameter and have a minimum nominal rating of 80 dBA at 3000 mm (10 feet).
- 3. Mount on removable adapter plates on outlet boxes.
- 4. Bells located outdoors shall be weatherproof type with metal housing and protective grille.
- 5. Each bell circuit shall have a minimum of twenty percent spare capacity.
- B. Speakers:

- 1. Shall operate on either 25 VRMS or 70.7 VRMS with field selectable output taps from 0.5 to 2.0W and originally installed at the one-half watt tap. Speakers shall provide a minimum sound output of 80 dBA at ten feet with the one-half watt tap.
- 2. Frequency response shall be a minimum of 400 HZ to 4000 HZ.
- 3. 100 mm (4 inches) or 200 mm (8 inches) cone type speakers ceiling mounted with white colored baffles in areas with suspended ceilings and wall mounted in areas without ceilings.

C. Strobes:

- 1. Xenon flash tube type minimum 15 candela in toilet rooms and 75 candela in all other areas with a flash rate of 1 HZ. Strobes shall be synchronized where required by the National Fire Alarm Code (NFPA 72).
- 2. Backplate shall be red with 13 mm (1/2 inch) permanent red letters. Lettering to read "Fire", be oriented on the wall or ceiling properly, and be visible from all viewing directions.
- 3. Each strobe circuit shall have a minimum of twenty (20) percent spare capacity.
- 4. Strobes may be combined with the audible notification appliances specified herein.

D. Fire Alarm Horns:

- 1. Shall be electric, utilizing solid state electronic technology operating on a nominal 24 VDC.
- 2. Shall be a minimum nominal rating of 80 dBA at ten feet.
- 3. Mount on removable adapter plates on conduit boxes.
- 4. Horns located outdoors shall be of weatherproof type with metal housing and protective grille.
- 5. Each horn circuit shall have a minimum of twenty (20) percent spare capacity.

2.8 ALARM INITIATING DEVICES

A. Manual Fire Alarm Stations:

- 1. Shall be non-breakglass, address reporting type.
- 2. Station front shall be constructed of a durable material such as cast or extruded metal or high impact plastic. Stations shall be semi-flush type.
- 3. Stations shall be of single action pull down type with suitable operating instructions provided on front in raised or depressed letters, and clearly labeled "FIRE".
- 4. Operating handles shall be constructed of a durable material. On operation, the lever shall lock in alarm position and remain so until reset. A key shall be required to gain front access for resetting, or conducting tests and drills.
- 5. Unless otherwise specified, all exposed parts shall be red in color and have a smooth, hard, durable finish.
- 6. Stations identified as key operated only shall have a single standardized lock and key separate from the control equipment.

B. Smoke Detectors:

- 1. Smoke detectors shall be UL listed for use with the fire alarm control unit being furnished.
- 2. Smoke detectors shall be addressable type complying with applicable UL Standards for system type detectors. Smoke detectors shall be installed in accordance with the manufacturer's recommendations and NFPA 72.
- 3. Detectors shall have an indication lamp to denote an alarm condition. Provide remote indicator lamps and identification plates where detectors are concealed from view. Locate the remote indicator lamps and identification plates flush mounted on walls so they can be observed from a normal standing position.
- 4. All spot type and duct type detectors installed shall be of the photoelectric type.
- 5. Photoelectric detectors shall be factory calibrated and readily field adjustable. The sensitivity of any photoelectric detector shall be factory set at 3.0 plus or minus 0.25 percent obscuration per foot.
- 6. Detectors shall provide a visual trouble indication if they drift out of sensitivity range or fail internal diagnostics. Detectors shall also provide visual indication of sensitivity level upon testing. Detectors, along with the fire alarm control units shall be UL listed for testing the sensitivity of the detectors.

C. Heat Detectors:

- 1. Heat detectors shall be of the addressable restorable rate compensated fixed-temperature spot type.
- 2. Detectors shall have a minimum smooth ceiling rating of 2500 square feet.
- 3. Ordinary temperature (135 degrees F) heat detectors shall be utilized in // elevator shafts and // elevator mechanical rooms. Intermediate temperature rated (200 degrees F) heat detectors shall be utilized in all other areas.
- 4. Provide a remote indicator lamp, key test station and identification nameplate (e.g. "Heat Detector Elevator P-_____) for each elevator group. Locate key test station in plain view on elevator machine room wall.

D. Water Flow and Pressure Switches:

- 1. Wet pipe water flow switches and dry pipe alarm pressure switches for sprinkler systems shall be connected to the fire alarm system by way of an address reporting interface device.
- All new water flow switches shall be of a single manufacturer and series and non-accumulative retard type. // See Section 21 12 00, FIRE-SUPPRESSION STANDPIPES and Section 21 13 13, WET-PIPE SPRINKLER SYSTEMS for new switches added. Connect all switches shown on the approved shop drawings.//
- 3. All new switches shall have an alarm transmission delay time that is conveniently adjustable from 0 to 60 seconds. Initial settings shall be 30-45 seconds. Timing shall be recorded and documented during testing.

2.9 SUPERVISORY DEVICES

A. Duct Smoke Detectors:

- Duct smoke detectors shall be provided and connected by way of an address reporting interface
 device. Detectors shall be provided with an approved duct housing mounted exterior to the duct, and
 shall have perforated sampling tubes extending across the full width of the duct (wall to wall).
 Detector placement shall be such that there is uniform airflow in the cross section of the duct.
- 2. Interlocking with fans shall be provided in accordance with NFPA 90A and as specified hereinafter under Part 3.2, "TYPICAL OPERATION".
- 3. Provide remote indicator lamps, key test stations and identification nameplates (e.g. "DUCT SMOKE DETECTOR AHU-X") for all duct detectors. Locate key test stations in plain view on walls or ceilings so that they can be observed and operated from a normal standing position.

B. Sprinkler and Standpipe System Supervisory Switches:

- 1. Each sprinkler system water supply control valve, riser valve or zone control valve, and each standpipe system riser control valve shall be equipped with a supervisory switch. Standpipe hose valves, and test and drain valves shall not be equipped with supervisory switches.
- 2. PIV (post indicator valve) or main gate valve shall be equipped with a supervisory switch.
- 3. Valve supervisory switches shall be connected to the fire alarm system by way of address reporting interface device. See Section 21 13 13, WET-PIPE SPRINKLER SYSTEMS for new switches to be added. Connect tamper switches for all control valves shown on the approved shop drawings.
- 4. The mechanism shall be contained in a weatherproof die-cast aluminum housing that shall provide a 19 mm (3/4 inch) tapped conduit entrance and incorporate the necessary facilities for attachment to the valves.
- 5. The entire installed assembly shall be tamper-proof and arranged to cause a switch operation if the housing cover is removed or if the unit is removed from its mounting.
- 6. Where dry-pipe sprinkler systems are installed, high and low air pressure switches shall be provided and monitored by way of an address reporting interface devices.
- 7. Fire pump running, power failure and phase reversal supervisory alarms shall be provided and monitored by way of address reporting interface devices for the fire pump located// indicate location.

2.10 ADDRESS REPORTING INTERFACE DEVICE

- A. Shall have unique addresses that reports directly to the building fire alarm panel.
- B. Shall be configurable to monitor normally open or normally closed devices for both alarm and trouble conditions.
- C. Shall have terminal designations clearly differentiating between the circuit to which they are reporting from and the device that they are monitoring.
- D. Shall be UL listed for fire alarm use and compatibility with the panel to which they are connected.
- E. Shall be mounted in weatherproof housings if mounted exterior to a building.

2.11 SMOKE BARRIER DOOR CONTROL

A. Electromagnetic Door Holders:

- New Door Holders shall be standard wall mounted electromagnetic type. In locations where doors do
 not come in contact with the wall when in the full open position, an extension post shall be added to
 the door bracket.
- 2. Operation shall be by 24 volt DC supplied from a battery located at the fire alarm control unit. Door holders shall be coordinated as to voltage, ampere drain, and voltage drop with the battery, battery charger, wiring and fire alarm system for operation as specified.
- B. A maximum of twelve door holders shall be provided for each circuit. Door holders shall be wired to allow releasing doors by smoke zone.
- C. Door holder control circuits shall be electrically supervised.
- D. Smoke detectors shall not be incorporated as an integral part of door holders.
- E. Where combination holder-closer units are required to match existing, these devices are furnished and installed as per Section 08 71 00, DOOR HARDWARE. Connection and wiring shall be as herein specified.

2.12 UTILITY LOCKS AND KEYS:

- A. All key operated test switches, control units, annunciator panels and lockable cabinets shall be provided with a single standardized utility lock and key.
- B. Key-operated manual fire alarm stations shall have a single standardized lock and key separate from the control equipment.
- C. All keys shall be delivered to the owner.

2.13 SPARE AND REPLACEMENT PARTS

- A. Provide spare and replacement parts as follows:
 - 1. Manual pull stations 5
 - 2. Key operated manual pull stations 3
 - 3. Heat detectors 2 of each type
 - 4. Fire alarm strobes 5
 - 5. Fire alarm bells 5
 - 6. Fire alarm speakers 5
 - 7. Smoke detectors 20
 - 8. Duct smoke detectors with all appurtenances 1
 - 9. Sprinkler system water flow switch 1 of each size
 - 10. Sprinkler system water pressure switch 1 of each type
 - 11. Sprinkler valve tamper switch 1 of each type
 - 12. Control equipment utility locksets 5
 - 13. Control equipment keys 25
 - 14. Key operated manual pull station keys 50
 - 15. 2.5 oz containers aerosol smoke 12
 - 16. Printer paper 3 boxes
 - 17. Printer replacement ribbons 3
 - 18. Monitor modules 3
 - 19. Control modules 3
 - 20. Fire alarm SLC cable (same as installed) 152 m (500 feet)

- B. Keys for key-operated manual pull stations shall be provided 30 days prior to actual installation.
- C. Spare and replacement parts shall be in original packaging and submitted to the owner.
- D. Furnish and install a storage cabinet of sufficient size and suitable for storing spare equipment. Doors shall include a pad locking device.
- E. Provide to the owner, all hardware, software, programming tools, license and documentation necessary to permanently modify the fire alarm system on site. The minimum level of modification includes addition and deletion of devices, circuits, zones and changes to system description, system operation, and digitized evacuation and instructional messages.

2.14 INSTRUCTION CHART:

Provide a typeset printed or typewritten instruction card mounted behind a Lexan plastic or glass cover in a stainless steel or aluminum frame with a backplate. Install the frame in a conspicuous location observable from each control unit where operations are performed. The card shall show those steps to be taken by an operator when a signal is received under all conditions, normal, alarm, supervisory, and trouble. Provide an additional copy with the binder for the input output matrix for the sequence of operation. The instructions shall be approved by the owner before being posted.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Installation shall be in accordance with NFPA 70, 72, 90A, and 101 as shown on the drawings, and as recommended by the major equipment manufacturer. Fire alarm wiring shall be installed in conduit. All conduit and wire shall be installed in accordance with Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS, Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW), and all penetrations of smoke and fire barriers shall be protected as required by Section 07 84 00, FIRESTOPPING.
- B. All new conduits, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. All existing accessible fire alarm conduit not reused shall be removed.
- C. All new or reused exposed conduit shall be painted in accordance with Section 09 91 00, PAINTING to match surrounding finished areas and red in unfinished areas.
- D. Existing devices that are reused shall be properly mounted and installed. Where devices are installed on existing shallow backboxes, extension rings of the same material, color and texture of the new fire alarm devices shall be used. Mounting surfaces shall be cut and patched in accordance with Section 01 00 00, GENERAL REQUIREMENTS, Restoration, and be re-painted in accordance with Section 09 91 00, PAINTING as necessary to match existing.
- E. All fire detection and alarm system devices, control units and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas. Exact locations to be approved by the owner.
- F. Speakers shall be ceiling mounted and fully recessed in areas with suspended ceilings. Speakers shall be wall mounted and recessed in finished areas without suspended ceilings. Speakers may be surface mounted in unfinished areas.
- G. Strobes shall be flush wall mounted 2,000 mm (80 inches) above the floor or 150 mm (6 inches) below ceiling, whichever is lower. Locate and mount to maintain a minimum 900 mm (36 inches) clearance from side obstructions.

- H. Manual pull stations shall be installed not less than 1050 mm (42 inches) or more than 1200 mm (48 inches) from finished floor to bottom of device and within 1500 mm (60 inches) of a stairway or an exit door.
- I. Where possible, locate water flow and pressure switches a minimum of 300 mm (12 inches) from a fitting that changes the direction of the flow and a minimum of 900 mm (36 inches) from a valve.
- J. Mount valve tamper switches so as not to interfere with the normal operation of the valve and adjust to operate within two revolutions toward the closed position of the valve control, or when the stem has moved no more than one-fifth of the distance from its normal position.

3.2 TYPICAL OPERATION

- A. Activation of any manual pull station, water flow or pressure switch, heat detector, or smoke detector shall cause the following operations to occur:
 - 1. For sprinkler protected buildings, flash strobes continuously only in the zone of alarm. For buildings without sprinkler protection throughout, flash strobes continuously only on the floor of alarm.
 - 2. Continuously sound a temporal pattern general alarm and flash all strobes in the building in alarm until reset at the local fire alarm control unit.
 - 3. Release only the magnetic door holders on the floor from which alarm was initiated after the alert signal.
 - 4. Transmit a separate alarm signal, via the main fire alarm control unit to the fire department.
 - 5. Unlock the electrically locked exit doors within the zone of alarm.
- B. Heat detectors in elevator machine rooms shall, in addition to the above functions, disconnect all power to all elevators served by that machine room after a time delay. The time delay shall be programmed within the fire alarm system programming and be equal to the time it takes for the car to travel from the highest to the lowest level, plus 10 seconds.
- C. Smoke detectors in the primary elevator lobbies of the building shall, in addition to the above functions, return all elevators in the hotel to the secondary floor.
- D. Smoke detectors in the remaining elevator lobbies, elevator machine room, or top of hoistway shall, in addition to the above functions, return all elevators in the hotel to the primary floor.
- E. Operation of a smoke detector at a corridor door used for automatic closing shall also release only the magnetic door holders on that floor. Operation of a smoke detector at a shutter used for automatic closing shall also release only the shutters on that floor.
- F. Operation of duct smoke detectors shall cause a system supervisory condition and shut down the ventilation system and close the associated smoke dampers as appropriate.
- G. Operation of any sprinkler or standpipe system valve supervisory switch, high/low air pressure switch, or fire pump alarm switch shall cause a system supervisory condition.

3.3 TESTS

- A. Provide the service of a NICET level III, competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system. Make all adjustments and tests in the presence of the OWNER.
- B. When the systems have been completed and prior to the scheduling of the final inspection, furnish testing equipment and perform the following tests in the presence of the OWNER. When any defects are detected, make repairs or install replacement components, and repeat the tests until such time that the complete fire alarm systems meets all contract requirements. After the system has passed the initial test and been approved by the OWNER, the contractor may request a final inspection.
 - 1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
 - 2. Test the insulation on all installed cable and wiring by standard methods as recommended by the equipment manufacturer.
 - 3. Run water through all flow switches. Check time delay on water flow switches. Submit a report listing all water flow switch operations and their retard time in seconds.
 - 4. Open each alarm initiating and notification circuit to see if trouble signal actuates.
 - 5. Ground each alarm initiation and notification circuit and verify response of trouble signals.

3.4 FINAL INSPECTION AND ACCEPTANCE

- A. Prior to final acceptance a minimum 30 day "burn-in" period shall be provided. The purpose shall be to allow equipment to stabilize and potential installation and software problems and equipment malfunctions to be identified and corrected. During this diagnostic period, all system operations and malfunctions shall be recorded. Final acceptance will be made upon successful completion of the "burn-in" period and where the last 14 days is without a system or equipment malfunction.
- B. At the final inspection a factory trained representative of the manufacturer of the major equipment shall repeat the tests in Article 3.3 TESTS and those required by NFPA 72. In addition the representative shall demonstrate that the systems function properly in every respect. The demonstration shall be made in the presence of a owner representative.

3.5 INSTRUCTION

- A. The manufacturer's authorized representative shall provide instruction and training to the owner as follows:
 - 1. Six one-hour sessions to owner and central attendant personnel for simple operation of the system. Two sessions at the start of installation, two sessions at the completion of installation and two sessions 3 months after the completion of installation.
 - 2. Three eight-hour sessions to maintenance technicians for maintaining, programming, modifying, and repairing the system at the completion of installation and one eight-hour refresher session 3 months after the completion of installation.
- B. The Contractor and/or the Systems Manufacturer's representative shall provide a typewritten "Sequence of Operation" including a trouble shooting guide of the entire system for submittal to the owner. The sequence of operation will be shown for each input in the system in a matrix format and provided in a loose leaf binder. When reading the sequence of operation, the reader will be able to quickly and easily determine what output will occur upon activation of any input in the system. The INPUT/OUTPUT matrix format shall be as shown in Appendix A to NFPA 72.

C.	Furnish the services of a competent instructor for instructing personnel in the programming requirements
	necessary for system expansion. Such programming shall include addition or deletion of devices, zones,
	indicating circuits and printer/display text.

---END---

SECTION 33 51 13 - NATURAL GAS PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Perform excavation and backfill required for work of this Section.
 - 2. Furnish and install gas piping and fittings within building and from building to meter including connection to meter as described in Contract Documents.

B. Related Sections

1. Section 22 05 00 – Common Work Results for Plumbing

1.2 REFERENCES

- A. American Society for Testing and Materials
 - ASTM A 53-01, 'Standard Specification for Pipe, Steel and Hot-Dipped, Zinc-Coated, Welded and Seamless'
 - 2. ASTM A 234-00a, 'Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperature Service'

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Pipe and Fittings - Black carbon steel, Schedule 40 pipe meeting requirements of ASTM A 53. Standard weight malleable iron screwed fittings meeting requirements of ASTM A 234.

2.2 MANUFACTURED UNITS

- A. Valves
 - 1. 125 psi bronze body ball valve, UL listed
 - 2. Approved Products
 - a. Apollo Series 80-100 by ConBraCo
 - b. FIG-30-A by Jenkins Valves
 - c. Model T-204 by Jomar International
 - d. 3410 by McDonald Valves & Fittings
 - e. BCI-100T (with tee handle) by Milwaukee Valve
 - f. 'Red Cap' gas ball valve by PGL Corp
 - g. Model B-6000-UL by Watts Regulator

B. Cocks

- 1. Gauge Cocks Conbraco 41-560 bronze gauge cock.
- 2. Lubricated Balancing Cocks
 - a. Square head type suitable for 175 psig wog at 150 deg F.

- b. Wrench handle for each valve.
- c. 2 inches And Smaller -
 - 1) Cast iron body with screwed connections.
 - 2) Approved Products
 - a) Powell 2200
 - b) Walworth 1796

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel pipe may have screwed or welded fittings.
- B. On lines serving gas-fired equipment, install gas cocks adjacent to equipment and easily accessible.
- C. Install 6 inch long minimum dirt leg, with pipe cap, on vertical gas drop serving each gas-fired equipment unit.
- D. Use fittings for changes of direction in pipe and for branch runouts.

3.2 FIELD QUALITY CONTROL

A. Site Tests - Before pipes are buried or concealed from view, test systems in Architect's presence at 60 psig for 4 hours and show no drop in pressure.

END OF SECTION 33 51 13



HOTEL SANDFORD

FURNITURE SPECIFICATIONS

San Diego, CA Heritage Architecture & Planning

11.9.2010

	FLIRNITLIRE SPECIFICATIONS KLANG & ASSOCIATES FF&E BUDGET & SUMMARY				
	Interior Design 2748 Loker Ave West, Carlsbad CA, 92010 P	: 760.438.1144			
	Hotel Sandford	Location:	SD Califormia		
	Area / Unit Type	Date:	11.8.2010		
ITEM CODE	DESCRIPTION	QTY	NOTES		
	Residential Corridors (at elevator)				
F-6	Side Table(Reuse Existing)	3			
F-7	Wing-back Chairs (Reuse Existing)	6			
		Total :			
	Management Office				
F-8	Desk	3			
F-8b	Return	1			
F-9	Desk (Reuse Existing)	1			
F-10	Task Chair	1			
F-10b	Task Chair (Reuse Existing)	2			
F-11	File Cabinets (Reuse Existing)	6			
F-12	Guest Chair (Reuse Existing)	3			
F-13	Credenza / Chest (Reuse Existing)	1			
		T-1-1			
		Total :			
	Lobby	T . T			
F-14	Center Banquette	1			
	Banquette Fabric 1	25			
	Banquette Fabric 2	3			
F-15	Side Chair	4			
	Chair Fabric 3	6			
	Chair Fabric 4	6			
F 40	Chair Fabric 5	3			
F-16	Round Accent Table	3			
F-17	Wing Back Chair	1			
	Wing Back Chair Fabric	8 3			
F-18	Wing Back Chair Fabric Sofa	2			
L-19	Sofa Fabric 8				
	Sofa Fabric 9				
	Sofa Pillow Fabric 7				
F-19	Lounge Chair	2			
1-19	Lounge Chair 1 Fabric				
	Lounge Chair 1 Fabric	+			
F-20	Accent Table	1			
F-20 F-21	Buffet (Reuse Existing)	1			
F-21	Not Used	2			
F-22	Tall Chest	1			
1 -25	Tun Onoot	'			
AC-3	Buffet Lamp	3			
AU-3	punct Lamp	J			

	FURNITURE SPECIFICATIONS			
		Total :		
	1st Floor Corridor (at secondary entrance)			
F-6	Side Table(Reuse Existing)	1		
F-7	Wing-back Chairs (Reuse Existing)	2		
F-24	Reading Hutch (Reuse Existing)	1		
		Total :		
	Library			
F-25	Club Chair	4		
	Club Chair Fabric			
F-26	Wing Back Chair	2		
	Wing Back Chair Fabric			
F-26a	Chair Pillow	1		
F-27	Reading Table	2		
F-28	Chair-side Chest (Reuse Existing)	1		
F-29	Book Shelves	2		
40.5				
AC-5	Floor Lamp	2		
		Total :		
	Game Room			
F-30	Game Table	1		
F-25	Club Chairs	2		
1 20	Club Chair Fabric			
F-31	Lounge Chairs	2		
	Inside Fabric	_		
	Outside Fabric			
F-32	Sofa	1		
	Sofa Fabric			
F-32a	Sofa Pillows			
F-33	Sofaback Table (Reuse Existing)	1		
F-34	Cocktail Table	1		
F-35	Corner Curio Cases	2		
F-36	Round Side Table	1		
F-6	Rectangular End Table (Reuse Existing)	1		
F-24b	Reading Hutch (Reuse Existing)	1		
AC-6	Buffet Lamp	2		
AC-9	55" Wall Mounted Flat Screen TV	1		
		Total :		
	Computer Boom	rotal :		
	Computer Room			
F-37	Desk Chairs (Reuse existing)	5		
		Total :		
	Rasament Lobby	Total .		
	Basement Lobby			

Klang Associates

F-38 Sofa 1	
Sofa Fabric 16	
F-38a Sofa Pillows 4	
F-39 Lounge Chair 2	
Lounge Chair Fabric	
F-40 Side Table (Reuse Existing) 2	
F-41 Tufted Ottoman Cocktail Table 1	
Tufted Ottoman Fabric	
AC-8 Table Lamp 2	
Total:	
Dining Room	
F-42 Bar Stools 4	
Bar Stool Fabric	
F-43 Table & Chairs (Reuse Existing)	
Total:	
Activity Room	
F-44 Piano (Reuse Existing) 1	
F-45 Armoire (Reuse Existing) 1	
Total:	
Roof Top Patio	
F-46 Dining Chairs & Cushion 4	
F-47 Round Dining Table (Reuse Existing) 1	
F-48 Side Table 2	
F-49 Lounge Chairs & Cushions 6	
F-50 Coffee Table 1	
T . (- 1	
Total :	
Art & Accessories	
Art & Accessories	eted Allowance
Art & Accessories	eted Allowance
Art & Accessories	eted Allowance
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing)	eted Allowance
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total:	eted Allowance
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry	eted Allowance
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry	eted Allowance
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry 33 Dressers / 2-Wing Backs & Miscellaneous Budge	
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry 33 Dressers / 2-Wing Backs & Miscellaneous Budge Total:	
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry 33 Dressers / 2-Wing Backs & Miscellaneous Budge Total: Area Rugs	
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Re-Finish / Re-Upholstry 33 Dressers / 2-Wing Backs & Miscellaneous Budge Total: Area Rugs CPT-1 Lobby Large 12'x18'	
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry 33 Dressers / 2-Wing Backs & Miscellaneous Budge Total: Area Rugs	
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry 33 Dressers / 2-Wing Backs & Miscellaneous Budge Total: Area Rugs CPT-1 Lobby Large 12'x18'	
Art & Accessories AR-1-? Worlds Fair Framed Photos Budge AC-10 Potted Plants (Reuse Existing) Total: Re-Finish / Re-Upholstry 33 Dressers / 2-Wing Backs & Miscellaneous Budge Total: Area Rugs CPT-1 Lobby Large 12'x18' CPT-2 Lobby Small 8'-6" x 11'-6"	

PROJECT NAME: **Hotel Sandford** PLAN: NA ROOM: ITEM CODE: **Residential Corridors** ITEM: Side Table REVISED: PHOTO/ **DESCRIPTION** IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: By Owner (existing) P.O. Number: Model No.: ΝÁ Description: Quantity: 3 Rectangular End Table 30" x 20" x 30"H Size: Notes: Material: * Touch up finish as needed Color: FABRIC# FINISH/WOOD: **FABRIC** FABRIC# FABRIC # **SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 **Total Furniture: TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 **Total Pillows Cost:** \$0.00 **DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-7 Wing Back Chair		PLAN: ROOM: REVISED:	NA Residential Corridors
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	By Owner (existing) NA		P.O. Number:	
Description:	Wing Back Chair		Quantity:	6
Size: Material:	Upholstry		Notes: * 4 Chairs in Blue Fabric not * 2 Chairs requiring re-uphols	
Color:			*	
FABRIC SPECIFICATION:	FABRIC#	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost: FABRIC SWATCH:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ROOM: ITEM CODE: Office F-8 ITEM: REVISED: Desk PHOTO/ **DESCRIPTION** IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: P.O. Number: Model No.: 8005721 Description: Quantity: Left Pedestal Desk with computer storage, keyboard 3 tray & file drawers 68"L x 30"W x 30.5"H Size: Notes: Material / Finish: Dark Cherry / Mahogany FABRIC# FABRIC# FINISH/WOOD: FABRIC # **FABRIC SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 **Total Furniture: TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 **Total Pillows Cost:** \$0.00 **DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-8b Pedestal Return		PLAN: ROOM: REVISED:	NA Office
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Coaster		P.O. Number:	
Model No.: Description:	800572R Right Pedestal Return		Quantity:	1
Size: Material / Finish:	50"L x 22"W x 30.5"H Dark Cherry / Mahogany		Notes:	
	Zam Grony , manegany		*	
			*	
FABRIC	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
SPECIFICATION:				
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage:	0 0	0 0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
FABRIC SWATCH:	ψ0.00	ψ0.00	φυ.ου	
FABRIC P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00 \$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:	•	Date:
				Date:
				Dute.

PROJECT NAME:	Hotel Sandford		PLAN:	
ITEM CODE:	F-9		ROOM:	Office
ITEM:	Desk (existing)		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA Mahogany 2 Ped existing desk	without modesty panel	Quantity:	1
Size:	44"W x 18"D x 31"H		Notes:	
Material:	Wood		* Touch up finish as needed	
			*	
			*	
FABRIC SPECIFICATION:	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer:				
Name:				
Number:				
Color: Content:				
Finish:				
Width: Repeat:				
Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
FABRIC	ψ0.00	ψ0.00	ψ0.00	
SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED:		MODIFICATION	ADD SERVICE	DESCIECT
DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:
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PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-10 Task Chair		PLAN: ROOM: REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	National Business Furniture		P.O. Number:	
Model No.: Description:	56518 7-way ergonomic Task chair wi	th arms	Quantity:	1
Size: Material: Color:	27"W x 27"D x 34 1/2"- 39"H, Upholstry	18"x18"seat	Notes: * COMMERCIAL GRADE MAT * *	ERIALS ONLY
FABRIC	FABRIC # 6	FABRIC # 16	* FABRIC #	FINISH/WOOD:
SPECIFICATION:	FABRIC#6	FABRIC # 10	FABRIC#	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item:	American Graffiti Cork Fabric Shown in image	0	0	
Total Yardage:	0	0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost: FABRIC SWATCH:	\$0.00	\$0.00	\$0.00	
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-10b Task Chair (existing)		PLAN: ROOM: REVISED:	NA Office
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA		Quantity:	2
Size:	Existing Upholstry as is		Notes:	
Material:			*	
Color:			*	
FABRIC	FABRIC # 6	FABRIC #	* FABRIC #	FINISH/WOOD:
SPECIFICATION:	I ADRIC # 0	I ADICIO #	TABRIC#	THISTI, WOOD.
Manufacturer: Name: Number: Color: Content: Finish: Width:				
Repeat: Technical Data:				
Note:				
Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 \$0.00 \$0.00	0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE:	Hotel Sandford F-11		PLAN: ROOM:	
ITEM:	File Cabinets (existing)		REVISED:	Office
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA Lateral File (stackable)		Quantity:	6
Size: Material:	30"W x 18"D x 29"H Metal		Notes:	
Color:	Cream		*	
FABRIC SPECIFICATION:	FABRIC # 6	FABRIC#	FABRIC#	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-12 Guest Chairs (existing)		PLAN: ROOM: REVISED:	NA Office	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	11				
Manufacturer:	By Owner (existing)		P.O. Number:		
Model No.: Description:	NA Existing Wood side chair with u	upholstered seat	Quantity:	3	
Size:	16" x 16" x 30"OH, 18"SH		Notes:		
Material / Finish:	Wood with Leather Seat		* Touch up finish as needed		
Note:			* * * *		
FABRIC	FABRIC # 6	FABRIC #	FABRIC #	FINISH/WOOD:	
SPECIFICATION:					
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code:					
Yardage Per Item:	0	0	0		
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00		
Total Cost:	\$0.00	\$0.00	\$0.00		
FABRIC SWATCH:					
<u>FABRIC</u> <u>P.O. Number</u>					
	DELIVER TO				
Furniture Unit Cost:	\$0.00	-			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00	
Total Pillows Cost:	\$0.00				
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT	
Klang & Associates App	roval:	Client Review:		Date:	
				Date:	

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-13 Credenza (existing)		PLAN: ROOM: REVISED:	NA Office
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	By Owner (existing)		P.O. Number:	
Description:	NA Existing Credenza		Quantity:	1
Size: Material: Color:			Notes: *Touch up finish as needed * *	
FABRIC	FABRIC # 6	FABRIC #	FABRIC #	FINISH/WOOD:
SPECIFICATION: Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage:	0 0	0 0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
FABRIC SWATCH:	φ0.00	φυ.ου	φυ.συ	
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:	,,,,,,	MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:	-	Date:
				Date:

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		FURNITURE SPECIFICAT	IONS	
PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-14 Center Banquette		<u>PLAN:</u> ROOM: REVISED:	NA Lobby
PHOTO/	Center Banquette			
<u>DESCRIPTION</u>				
IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	Vendor of Choice Custom		P.O. Number:	
Description:	Oval tufted Banquette with co	ntrasting fabrics	Quantity:	1
Size: Material / Finish:	4-6"'x6'-6" Oval, 18"SH, 54"OH Upholstered with wood feet		Notes: * COMMERCIAL GRADE MATERIALS ONLY * HDHR MEDIUM DENSITY FOAM * *	
FABRIC	FABRIC # 1	FABRIC # 2	FABRIC #	FINISH/WOOD:
SPECIFICATION:	TABINO # 1	TABINO#2	TABINO #	Mahogany
Manufacturer:	Pindler & Pindler	Concertex Incognitus Green		
Name:	Velluto 9134	Veritas		
Number: Color:	Loden	Brique		
Content:	65%Poly, 35%Co.	100%Polyurethane		
Finish: Width:	54"	54"		
Repeat:	34	NA		
Technical Data:	200,000D.R.	100,000 D.R.		
Note:	Primary Seat & Back fabric	Accent Trim Fabric		
Cleaning Code:	S	_		
Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC			i i	
SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED:	ψ0.00			
DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

		Klang Associates		
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PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-15 Side Chair		PLAN ROOM REVISED	Lobby
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	Vendor of Choice Custom		P.O. Number:	
Description:	Upholstered Accent Chair with	thout tufting	Quantity:	4
Size: Material /Finish:	29" X 29" X 38"H, 18"SH Contrast Upholstry on inside and out with contrast welting Wood feet in mahogany finish		Notes: * COMMERCIAL GRADE MATERIALS ONLY * HDHR MEDIUM DENSITY FOAM *	
FABRIC SPECIFICATION:	FABRIC # 3	FABRIC # 4	FABRIC # 5	FINISH/WOOD: Mahogany
Manufacturer: Name: Number: Color: Content:	Robert Allen Contract Scroll Squared Chili 100% Recycled	Michael John Durables Perfecto Honey 100&Poly	Duralee Metro Chenille 90642 623 Mink 100% Poly	TO THE REAL PROPERTY.
Finish:				
Width: Repeat: Technical Data:	54" 7"V, 7"H, 3.5 Drop 36,000D.R.	54" NA 100,000D.R.	54" NA 100,000D.R.	
Note:	Inside Fabric	Outside Fabric	Welt Fabric	
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:	336 336 33 38 38 38			
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost	\$0.00		•	•

TOTAL ITEM COST:

ADD SERVICE

\$0.00

RESELECT

Date:

Total Furniture:

Total Fabric Cost: Total Pillows Cost:

Klang & Associates Approval:

DATE ISSUED: DATE REVISED: DATE REVISED: \$0.00

\$0.00 \$0.00

MODIFICATION

Client Review:

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FURNITURE SPECIFICATIONS PROJECT NAME: **Hotel Sandford** PLAN: NA ROOM: ITEM CODE: Lobby ITEM: **Round Accent Table** REVISED: PHOTO/ **DESCRIPTION** IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: Steinworld P.O. Number: Model No.: 820-043 Description: Quantity: Georgetown Round Chairside table 3 18"Dia x 25"H Size: Notes: Material /Finish: Wood as shown in image FABRIC #11 FABRIC #17 FINISH/WOOD: FABRIC # **FABRIC SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL INSTRUCTIONS DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 **Total Furniture: TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 **Total Pillows Cost:** \$0.00 **DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

		Klang Associates FURNITURE SPECIFICAT	IONS	
PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-17 Wing-back Chair		<u>PLAN:</u> <u>ROOM:</u> REVISED:	NA Lobby
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	Vendor of Choice Custom		P.O. Number:	
Description:	High Back Wing Chair with nail	Ihdeds to match image	Quantity:	1
Size: Material: Color:	32" x 32" x 45"H, 18"SH Upholstered with wood feet in r	mahogany finish	Notes: * COMMERCIAL GRADE MAT * HDHR MEDIUM DENSITY FO	
FABRIC	FABRIC # 2	FABRIC # 7	* FABRIC #	FINISH/WOOD:
SPECIFICATION:	FABRIC # 2	FABRIC# /	FABRIC#	Mahogany
Manufacturer: Name: Number: Color: Content: Finish:	Concertex Incognitus Green Veritas Brique 100%Polyurethane	Fabricut Armstrong Grenadine 59%Rayon, 21%CO, 20%Poly		
Width:	54"	54"		
Repeat: Technical Data:	NA 100,000 D.R.	2.5"V, 2"H		
Note: Cleaning Code:	Primary Chair Fabric	Outside Back Fabric		
Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
<u>FABRIC</u>	W. 15 15 15 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16		·	
<u>SWATCH:</u>		XXX		
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT

Client Review:

Date: Date:

Klang & Associates Approval:

PROJECT NAME: **Hotel Sandford** PLAN: NA ITEM CODE: ROOM: Lobby F-18 ITEM: **REVISED: Curved Sofa** PHOTO/ **DESCRIPTION IMAGE FOR** CONCEPTUAL **PURPOSES ONLY** R6'-57" 6.03 (SHOWS STYLE) Manufacturer: Vendor of Choice P.O. Number: Model No.: Custom Description: Curved High back sofa with contrasting fabrics & Quantity: 2 nailhead detailing to match image 6'L x 28"D x 52"BH, 18"SH Size: Notes: Material/ Finish: * COMMERCIAL GRADE MATERIALS ONLY Mahogany finished wood feet * HDHR MEDIUM DENSITY FOAM FABRIC # 8 FABRIC # 9 FABRIC #7 FINISH/WOOD: **FABRIC** SPECIFICATION: Mahogany Manufacturer: Fabricut Pindler & Pindler Fabricut Name: Gemini Velluto Armstrong Number: Color: Grenadine Antique Grenadine Content: 43%Rayon, 55%Poly 100% Poly 59%Rayon, 21%CO, 20%Poly Finish: Teflon Width: 54" 54" 54" Railroad (13.7"V repeat) 2.5"V, 2"H Repeat: NA Technical Data: 100,000D.R. Note: Outside, back, sides & Inside Fabric **Lumbar Pillows** Front at base Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC SWATCH: FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 Total Furniture: **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

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		FURNITURE SPECIFICAT	IONS	
PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	F-19		ROOM: REVISED:	Lobby
ITEM:	Lounge Chair		REVISED:	•
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL		5		
PURPOSES ONLY (SHOWS STYLE)	Vendor of Choice		P.O. Number:	2
Model No.:	Custom		P.O. Number:	2
Description:	Wood & Rattan chair with upho to match image	elstered cushions	Quantity:	
Size:	29"W x 35"D x 36"H, 25"AH,	19"SH	Notes:	
Material:			* COMMERCIAL GRADE MAT	
0-1			* HDHR MEDIUM DENSITY F	MAC
Color:			*	
FABRIC	FABRIC # 1	FABRIC # 6	FABRIC #	FINISH/WOOD:
SPECIFICATION:				Mahogany
Manufacturer:	Pindler & Pindler	Pindler & Pindler		
Name:	Velluto	Venusta		
Number: Color:	9134 Loden	9174 Noche		
Content:	65%Poly, 35%Co.	84% Rayon, 16% Poly		
-	00701 0131, 0070001	0 1 / c 1 tay 0 , 10 / c 1 c		
Finish:	- 411	Teflon		
Width:	54"	54" 25 3/4"		
Repeat: Technical Data:	200,000D.R.	25 3/4		
Teeningal Bata.	200,0000			
Note:	Primary Seat & Back fabric	Back Pillow Front		
Cleaning Code:	S	S		
Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC			******	
<u>SWATCH:</u>				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture:	\$0.00		TOTAL ITEM COST:	\$0.00
Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00			40.00
DATE ISSUED:	φυ.υυ			
DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
DATE REVISED:				
Klang & Associates App	roval:	Client Review:		Date:
				Date:

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FURNITURE SPECIFICATIONS PROJECT NAME: **Hotel Sandford** PLAN: NΑ ROOM: ITEM CODE: Lobby F-20 ITEM: REVISED: **Accent Table** PHOTO/ **DESCRIPTION** IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: Stein World P.O. Number: Model No.: 57382 Description: Quantity: Star Accent Table with etched metal 26"H x 20"W x 20"D Size: Notes: Material / Finish: FABRIC # 18 FABRIC# FINISH/WOOD: FABRIC # **FABRIC SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 **Total Furniture: TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

		Klang Associates	ATIONS	
		FURNITURE SPECIFICE	ATIONS	
PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-21 Buffett (existing)		PLAN: ROOM: REVISED:	Lobby
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	By Owner (existing) NA		P.O. Number:	
Description:	Existing Buffet		Quantity:	1
Size:			Notes:	
Material:			* Touch up finish as needed	
Color:			*	
FABRIC SPECIFICATION:	FABRIC # 17	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
FABRIC				
P.O. Number SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			l
<u>Total Furniture:</u> <u>Total Fabric Cost:</u> <u>Total Pillows Cost:</u>	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00

MODIFICATION

Client Review:

DATE ISSUED: DATE REVISED: DATE REVISED:

Klang & Associates Approval:

ADD SERVICE

RESELECT

Date: Date:

PROJECT NAME: **Hotel Sandford** PLAN: NΑ ROOM: ITEM CODE: F-22 Lobby ITEM: **Not Used REVISED:** PHOTO/ **DESCRIPTION** IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: P.O. Number: Model No.: Description: Quantity: Size: Notes: Material: Color: FABRIC # 17 FABRIC# FINISH/WOOD: **FABRIC** FABRIC # **SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 \$0.00 \$0.00 Cost per yard: \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number SPECIAL INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 **Total Furniture:** \$0.00 **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 **Total Pillows Cost:** \$0.00 DATE ISSUED: DATE REVISED: **MODIFICATION** ADD SERVICE RESELECT **DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

Klang Associates

		FURNITURE SPECIE		
PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-23 Tall Chest		PLAN ROOM REVISED	l <u>:</u> NA l: Lobby):
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Steinworld 70366-B & 70366-T		P.O. Number:	
Model No.: Description:	Hastings Accent Console		Quantity:	1
Size: Material / Finish:	80"H x 32"W x 18"D Black & Sand Wood		Notes: * * * *	
FABRIC	FABRIC # 17	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
<u>FABRIC</u> <u>SWATCH:</u>				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture:	\$0.00 \$0.00			•
Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:	\$0.00	MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	oroval:	Client Review:		Date:
				Date:

Klang Associates

		FURNITURE SPECIFIC		
PROJECT NAME:	Hotel Sandford		PLAN	<u>l:</u> NA
ITEM CODE: ITEM:	AC-3 Buffet Lamp		ROOM REVISED	<u>l:</u> Lobby
PHOTO/ DESCRIPTION	Bullet Lamp			•
CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	NIIIY Reson			
Manufacturer: Model No.:	Steinworld 29156-1		P.O. Number:	
Description:	Gia Buffet Lamp		Quantity:	3
Size: Material:	13"W x 32"H x 9"D Wood		Notes:	
Color:			*	
FABRIC SPECIFICATION:	FABRIC # 17	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content:				
Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard: Total Cost:	0 \$0.00 \$0.00	0 \$0.00 \$0.00	0 \$0.00 \$0.00	
FABRIC SWATCH:				
FABRIC P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
		1		Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-6 Side Table		PLAN: ROOM: REVISED:	NA 1st Floor Corridor
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	20			
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA		Quantity:	1
Description.			-	'
Size: Material: Color:	30" x 20" x 30"H		Notes: * Touch up finish as needed * *	
EARRIC	EARRIC #	EARDIC #	*	EINICH/WOOD.
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item:				
Yardage Per item: Total Yardage:	0 0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost: FABRIC SWATCH:	\$0.00	\$0.00	\$0.00	
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost: DATE ISSUED:	\$0.00		<u> </u>	
DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-7 Wing Back Chair		PLAN: ROOM: REVISED:	NA 1st Floor Corridor
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	By Owner (existing) NA		P.O. Number:	
Description:			Quantity:	2
Size: Material: Color:			Notes: * Select 2 chairs in Upholstry requiring re-upholstry * *	shown in Image, not
FABRIC SPECIFICATION:	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost: FABRIC SWATCH:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC				
P.O. Number SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-24 Reading Hutch		PLAN: ROOM: REVISED:	NA 1st Floor Corridor
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	By Owner (existing) NA		P.O. Number:	
Description:			Quantity:	1
Size:			Notes:	
Material:			*	
Color:			*	
FABRIC SPECIFICATION:	FABRIC#	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content:				
Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code:	0	0	0	
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ITEM CODE: ROOM: F-25 Library ITEM: **Club Chair REVISED:** PHOTO/ **DESCRIPTION IMAGE FOR** CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: Vendor of Choice P.O. Number: Model No.: Custom Description: Club chair with contrasting to match image Quantity: 29"W x 31.5"D x 39"H, 25"AH, 19"SH, 22"SD Size: Notes: Material / Finish: * COMMERCIAL GRADE MATERIALS ONLY Upholstered with wood feet in mahogany finish * HDHR MEDIUM DENSITY FOAM Color: * REMOVABLE SEAT CUSHIONS FABRIC # 10 FABRIC# FINISH/WOOD: FABRIC # **FABRIC** SPECIFICATION: Manufacturer: Loom Source Signature Name: Number: Color: Vine Content: 62%Rayon, 38%Poly Finish: Teflon Width: 54" 5 5/8"V, 6 7/8"H Repeat: Technical Data: 30,000D.R. Note: Cleaning Code: S Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC SWATCH: FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 Total Furniture: **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ITEM CODE: ROOM: Library F-26 ITEM: **REVISED:** Wing Back PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: P.O. Number: Model No.: Custom Description: Wing back chair to match image Quantity: 2 29" x 29" x 45"H, 19"SH Size: Notes: * COMMERCIAL GRADE MATERIALS ONLY Material: * HDHR MEDIUM DENSITY FOAM Color: * REMOVABLE SEAT CUSHIONS FABRIC # 11 FABRIC# FINISH/WOOD: **FABRIC** FABRIC # **SPECIFICATION:** Manufacturer: Robert Allen Name: Umma Shawl Number: Color: Truffle Content: Finish: Width: 55" 28"H, 28"V Repeat: Technical Data: 51,000D.R. Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 **Total Furniture: TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 Total Pillows Cost: \$0.00 **DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-27 Reading Table		PLAN: ROOM: REVISED:	NA Library
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	Milan-			
Manufacturer:	Uttermost		P.O. Number:	
Model No.: Description:			Quantity:	2
				_
Size: Material:	32"Dia x 30"H / 30"Dia		Notes:	
Color:			* *	
FABRIC	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
SPECIFICATION:				
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
<u>FABRIC</u> <u>SWATCH:</u>				
FABRIC P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00		1	
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:	-	Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	
ITEM CODE: ITEM:	F-28		ROOM:	Library
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	Side Table (existing)		REVISED:	
Manufacturer: Model No.:	By Owner, (existing) NA		P.O. Number:	
Description:	IVA		Quantity:	1
Size: Material:	24"W x 18"D x 30"H		Notes:	
Color:			* * *	
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	
ITEM CODE: ITEM:	F-29 Book Shelves		<u>ROOM:</u> REVISED:	Library
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	BOOK SHEIVES			
Manufacturer:	Steinworld		P.O. Number:	
Model No.:				
Description:			Quantity:	2
Size:			Notes:	
Material:			*	
Color:			*	
GOIOI:			*	
FABRIC	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
SPECIFICATION:				
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
FABRIC SWATCH:				
FABRIC P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			•
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		<u>PLAN:</u>	
ITEM CODE:	AC-5		ROOM:	Library
ITEM:	Floor Lamp		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	Courty Links Sections			
Manufacturer:	Uttermost		P.O. Number:	
Model No.:	28514-1			
Description:	Dalton Floor Lamp		Quantity:	2
Size:	57"H		Notes:	
Material / Finish:	Burnished wood with bronze de	etailing	*	
			*	
			*	
FABRIC	FABRIC#	FABRIC#	FABRIC #	FINISH/WOOD:
SPECIFICATION:				
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture:	\$0.00		TOTAL ITEM COST:	\$0.00
Total Fabric Cost:	\$0.00		TO THE HEIR GOOT.	ψυ.υυ
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-30 Game Table		PLAN: ROOM: REVISED:	NA Game Room
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Steinworld		P.O. Number:	
Model No.: Description:	75829 Game Table		Quantity:	1
Size:	32" x 32" 30"H		Notes:	
Material:	Wood		*	
			*	
FABRIC SPECIFICATION:	FABRIC #	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard: Total Cost:	0 \$0.00 \$0.00	0 \$0.00 \$0.00	0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	
ITEM CODE: ITEM:	F-25		ROOM: REVISED:	Game Room
II CIVI.	Club Chairs		REVISED.	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL				
PURPOSES ONLY (SHOWS STYLE)		1		
Manufacturer:	Vendor of Choice		P.O. Number:	
Model No.: Description:	Custom Club chair to match image		Quantity:	2
2000 p	oras criaii to matori image			_
Size: Material: Color:	26" x 26" x 36"H, 19"SH		Notes: * COMMERCIAL GRADE MA* * HDHR MEDIUM DENSITY F * REMOVABLE SEAT CUSHION	OAM
FABRIC	FABRIC # 12	FABRIC#	* FABRIC #	FINISH/WOOD:
SPECIFICATION:	FABRIC# 12	FADRIC#	PADRIC#	Mahonagy
Manufacturer: Name:	Robert Allen Broken Circles			
Number:				
Color: Content:	Tulip 64%Rayon, 36%Poly			
Finish: Width:				
Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage:	0	0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:	,,,,,	MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	proval:	Client Review:	•	Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	
ITEM CODE: ITEM:	F-31 Lounge Chairs		ROOM: REVISED:	Game Room
	Lounge Chairs		KEVIOLDI	
PHOTO/				
DESCRIPTION				
	THE RESERVE OF THE PERSON NAMED IN			
IMAGE FOR	S00000110012010	THE R. L. L.		
CONCEPTUAL				
PURPOSES ONLY				
(SHOWS STYLE)				
Manufacturer: Model No.:	Vendor of Choice Custom		P.O. Number:	
Description:	Upholstered chair with wood fe	eet to match image	Quantity:	2
				_
Size:	30" x 30" x 39"H, 18"SH, 27"	AH	Notes:	
Material:			* COMMERCIAL GRADE MA * HDHR MEDIUM DENSITY F	
Color:			* REMOVABLE SEAT CUSHIC	
			*	
FABRIC SPECIFICATION:	FABRIC # 13	FABRIC # 14	FABRIC #	FINISH/WOOD:
SPECIFICATION.				
Manufacturer:	Duralee	Fabricut		
Name:	00040	Brashares-F		
Number: Color:	90642 38 Russett	Red Pepper		
Content:	100%Poly	50%CO, 50%Viscose		
	·	,		
Finish:	Teflon	E 4 !!		
Width: Repeat:	54" NA	54" 3.5"H (Stripe)		
Technical Data:	100,000D.R.	30,000D.R.		
Nata	Chair Inaide Fahria	Outoida Daak Fahria		
Note:	Chair Inside Fabric	Outside Back Fabric		
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC	的复数形式的现在分词			
SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Eurnitura Unit Caat	CO 00			
Furniture Unit Cost: Total Furniture:	\$0.00 \$0.00			A
Total Fabric Cost:	\$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
DATE REVISED:		MODIFICATION	ADD OLIVIOL	RESELECT
Klang & Associates App	proval:	Client Review:		Date:
				Data
				Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ITEM CODE: ROOM: **Game Room** F-32 ITEM: REVISED: Sofa PHOTO/ **DESCRIPTION IMAGE FOR** CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: Vendor of Choice P.O. Number: Model No.: Custom Description: Upholstered sofa to match iomage Quantity: Size: 8'L x 38"D x 39"H, 18"SH Notes: * COMMERCIAL GRADE MATERIALS ONLY Material: * HDHR MEDIUM DENSITY FOAM Color: * REMOVABLE SEAT CUSHIONS FABRIC # 15 FABRIC # 14 FINISH/WOOD: FABRIC # 12 **FABRIC** SPECIFICATION: Manufacturer: Kravet Fabricut Robert Allen Name: Brashares-F **Broken Circles** Number: 29744 Color: Red Pepper Content: 65%Rayon, 35%Poly 50%CO, 50%Viscose 64%Rayon, 36%Poly Finish: Width: 55" 54" 54" 3.5"H (Stripe) 5"V, 2.25"H, Repeat: NA 12,000D.R. Technical Data: 88,000D.R. 30,000D.R. Note: Primary Sofa Fabric Outside Back Fabric Pillows Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC SWATCH: FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 Total Furniture: **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	F-33		ROOM:	Game Room
ITEM:	Sofaback Table (existing)		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA V		Quantity:	1
Size: Material:	54"L x 15"D x 27"H		Notes: * Refinish as necessary	
Color:			*	
FABRIC SPECIFICATION:	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish:				
Width: Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Dute.

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-34 Cocktail Table		PLAN: ROOM: REVISED:	NA Game Room
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Ashley		P.O. Number:	
Model No.: Description:	T564-1 Cocktail Table		Quantity:	1
Size: Material:	50"W x 30"D x 20"H		Notes: * COMMERCIAL GRADE MAT	ERIALS ONLY
Color:			*	
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC#	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	F-35		ROOM:	Game Room
ITEM:	Corner Kurio		ROOM: REVISED:	
PHOTO/ DESCRIPTION				
CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	Steinworld 75730		P.O. Number:	
Description:	Corner Bookcase		Quantity:	2
Size: Material:	77H x 34"W x 18"D		Notes:	
waterial.			*	
Color:			*	
FABRIC	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
SPECIFICATION:	TABING #	TABRIC#	TABRIC #	Tillion/WOOD.
Manufacturer: Name:				
Number:				
Color:				
Content:				
Finish:				
Width:				
Repeat:				
Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost: FABRIC	\$0.00	\$0.00	\$0.00	
SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture:	\$0.00		TOTAL ITEM COST.	\$0.00
Total Fabric Cost:	\$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED:				
DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	F-36		ROOM:	Game Room
ITEM:	Side Table		REVISED:	
PHOTO/ DESCRIPTION				
CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Steinworld		P.O. Number:	
Model No.: Description:	80941 Round Pedestal		Quantity:	1
Size: Material:	26"H x 21"Dia		Notes: * COMMERCIAL GRADE MA	TERIALS ONLY
Color:			* *	
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer:				
Name: Number:				
Color:				
Content:				
Finish: Width:				
Repeat:				
Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00	
Cost per yard: Total Cost:	\$0.00	\$0.00	\$0.00	
<u>FABRIC</u> <u>SWATCH:</u>				
<u>FABRIC</u> P.O. Number				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	F-6		ROOM: REVISED:	Game Room
ITEM:	Side Table		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	20			
Manufacturer: Model No.:	By Owner (existing) NA		P.O. Number:	
Description:			Quantity:	1
Size: Material:	30" x 20" x 30"H		Notes: * Touch up as needed *	
Color:			*	
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer:				
Name:				
Number: Color:				
Content:				
Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage:	0	0 0	0 0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture:	\$0.00 \$0.00			
Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	
ITEM CODE: ITEM:	F-24b Hutch		ROOM: REVISED:	Game Room
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA Existing Hutch to remain		Quantity:	1
Description:	Existing flutch to remain		Quantity:	1
Size: Material:			Notes: * Touch up as needed *	
Color:			*	
FABRIC	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
SPECIFICATION:	1		1	
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat:				
Technical Data:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00		_l	
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford AC-6 Buffet Lamp		PLAN: ROOM: REVISED:	NA Game Room
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	Charles Mandres Constraints			
Manufacturer:	Steinworld		P.O. Number:	
Model No.: Description:	29473 Omari Buffet		Quantity:	2
				_
Size: Material / Finish:	10"W x 40"H x 10"D Metalic Bronze		Notes:	
			*	
			*	
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Vote: Cleaning Code: Yardage Per Item: Total Yardage: Cost per yard: Total Cost: FABRIC SWATCH:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC_				
P.O. Number SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00		_	
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	AC-9		ROOM:	Game Room
ITEM:	Flat Screen TV		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE) Manufacturer: Model No.: Description:	(AELEI	RONICS	P.O. Number: Quantity:	1
Description.	33 That Screen TV to be Wall I	mounted	Quantity.	
Size: Material / Finish:	52" x 34"		Notes: * * * *	
FABRIC SPECIFICATION:	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:	_			
Yardage Per Item: Total Yardage: Cost per yard: Total Cost: <u>FABRIC</u>	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	proval:	Client Review:	•	Date:
				Date:

DDO JEOT MAME.			DI ANI	ALA Î	
PROJECT NAME: ITEM CODE:	Hotel Sandford F-37		<u>PLAN:</u> <u>ROOM:</u>	NA Computer Room	
ITEM:	Desk Chair		REVISED:	Computer Recom	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	12				
Manufacturer:	By Owner (existing)		P.O. Number:		
Model No.:	NA (Castang)				
Description:			Quantity:	5	
Size: Material: Color:			Notes: * Use Chairs in best condition * Touch up as needed *		
FABRIC .	FABRIC #	FABRIC #	* FABRIC #	FINISH/WOOD:	
SPECIFICATION:	I ADICIO #	I ADICIO #	TABRIC#	TINIST/WOOD.	
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code:					
Yardage Per Item:	0	0	0		
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00		
Total Cost:	\$0.00	\$0.00	\$0.00		
FABRIC SWATCH:					
<u>FABRIC</u> <u>P.O. Number</u>					
SPECIAL INSTRUCTIONS	DELIVER TO				
Furniture Unit Cost:	\$0.00				
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00	
Total Pillows Cost: DATE ISSUED:	\$0.00				
DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT	
Klang & Associates App	roval:	Client Review:		Date:	
				Date:	

PROJECT NAME: **Hotel Sandford** PLAN: NA ITEM CODE: ROOM: F-38 **Basement Lobby** ITEM: **REVISED:** Sofa PHOTO/ **DESCRIPTION IMAGE FOR** CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: Vendor of Choice P.O. Number: Model No.: Custom Description: Upholstered Sofa with wood trim. Style to match image Quantity: Size: 8'L x 36"D 40"H, 18"SH Notes: * COMMERCIAL GRADE MATERIALS ONLY Material: * HDHR MEDIUM DENSITY FOAM Color: * REMOVABLE SEAT CUSHIONS FABRIC # 17 FINISH/WOOD: FABRIC # 16 FABRIC # 18 **FABRIC** SPECIFICATION: Mahogany Manufacturer: Concertex Incognitus Green Fabricut Fabricut Hanabi Name: Veritas Majestic Number: Color: Autumn Glow Bordeaux Mocha Swirl Content: 100%Polyurethane 69%Rayon, 31%Poly Finish: Width: 54" 54" 27.5"V, 14.5"H Repeat: NA 20,000D.R. Technical Data: 100,000 D.R. Note: Sofa Fabric 2 Sofa Pillows 2 Sofa Pillows Cleaning Code: S Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC SWATCH: FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 Total Furniture: **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date:

Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ITEM CODE: ROOM: **Basement Lobby** F-39 ITEM: **REVISED: Lounge Chair** PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: Vendor of Choice P.O. Number: Model No.: Custom Description: Upholstered Chair with wood feet. Style to match image Quantity: 34" x 34" x 40"H, 18"SH Size: Notes: * COMMERCIAL GRADE MATERIALS ONLY Material: * HDHR MEDIUM DENSITY FOAM Color: * REMOVABLE SEAT CUSHIONS FABRIC # 19 FABRIC# FINISH/WOOD: FABRIC # **FABRIC** SPECIFICATION: Mahogany Manufacturer: Fabricut Name: Altitude Number: Color: Grenadine Content: 100%Poly Finish: Soil & Stain repellant Width: 54" 19.5"V, 6.75"H Repeat: Technical Data: 30,000 D.R. Note: Cleaning Code: S Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC SWATCH: FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 Total Furniture: **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ROOM: ITEM CODE: F-40 **Basement Lobby** ITEM: Side Table REVISED: PHOTO/ **DESCRIPTION** 18 IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: By Owner (existing) P.O. Number: Model No.: Description: Quantity: 2 Existing Square end table 24" x 24" x 29"H Size: Notes: Material: * Touch up finish as necessary Color: FABRIC # 6 FABRIC# FINISH/WOOD: **FABRIC** FABRIC # **SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL INSTRUCTIONS DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 **Total Furniture: TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 **Total Pillows Cost:** \$0.00 **DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME:	Hotel Sandford		PLAN	
ITEM CODE: ITEM:	F-41 Coctail Table		ROOM: REVISED:	Basement Lobby
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	Social Pasic			
Manufacturer:	Vendor of Choice		P.O. Number:	
Model No.:	Custom			
Description:	Tufted Ottoman with wood trim image without wheels on feet.	and feet. Style to match	Quantity:	1
Size:	24" x 56" x 18"H		Notes:	
Material:			* COMMERCIAL GRADE MA	TERIALS ONLY
Color:			*	
00101:			*	
FABRIC SPECIFICATION:	FABRIC # 20	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer:	Duralee			
Name:	Faux Leather			
Number: Color:	14108 582 Saddle			
Content:	100%Polyvinyl: face 65%Poly, 35%CO: back			
Finish:				
Width:	54"			
Repeat: Technical Data:	NA 100,000 D.R.			
recillical Data.	100,000 B.K.			
Note:				
Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
<u>FABRIC</u> <u>SWATCH:</u>				
FABRIC P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00		<u> </u>	•
Total Furniture:	\$0.00		TOTAL ITEM COST:	\$0.00
Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00			¥
DATE ISSUED: DATE REVISED: DATE REVISED:	ţ5.00	MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	proval:	Client Review:		Date:
				Date:
				Dute.

PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	AC-8		ROOM: REVISED:	Basement Lobby
ITEM:	Table Lamp		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE) Manufacturer: Model No.: Description:	Uttermost 26426-1 Lahela Table Lamp		P.O. Number: Quantity:	2
Size:	16"W x 30"H x 16"D		Notes:	
Material:			*	
	Distressed copper bronze meta	al & irridescent crackled glass	*	
Color:			*	
FABRIC	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
SPECIFICATION:	FABRIC#	FABRIC#	FABRIC#	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Cleaning Code: Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture:	\$0.00		TOTAL ITEM COST:	\$0.00
Total Fabric Cost:	\$0.00			¥0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date
				Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ITEM CODE: ROOM: **Dining Room** F-42 ITEM: **Bar Stool** REVISED: PHOTO/ DESCRIPTION **IMAGE FOR** CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: Vendor of Choice P.O. Number: Model No.: Custom Description: Wood Bar Stool to match image Quantity: 21"W x 23"D x 45"H Size: Notes: * COMMERCIAL GRADE MATERIALS ONLY Material: Wood with upholstered seat and retan back. * HDHR MEDIUM DENSITY FOAM Color: * REMOVABLE SEAT CUSHIONS FABRIC # FINISH/WOOD: FABRIC# FABRIC # **FABRIC SPECIFICATION:** Manufacturer: Concertex Incognitus Green Veritas Name: Number: Color: Brique Content: 100%Polyurethane Finish: Width: 54" Repeat: NA Technical Data: 100,000 D.R. Note: Accent Trim Fabric Cleaning Code: Yardage Per Item: 0 0 0 0 Total Yardage: 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 \$0.00 **Total Furniture: TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-43 Dining Set		PLAN: ROOM: REVISED:	NA Dining Room
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	By Owner (existing) NA		P.O. Number:	
Description:	Rectangular Dining table & 4 S	lead base chairs	Quantity:	TBD
Size:			Notes:	
Material:			*	
Color:			*	
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 #VALUE! \$0.00 \$0.00		TOTAL ITEM COST:	#VALUE!
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	NA
ITEM CODE:	F-44		ROOM:	Activities Room
ITEM:	Upright Piano		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA Upright Piano		Quantity:	1
Size:	52"W x 24"D x 50"H		Notes:	
Material:			* COMMERCIAL GRADE MAT	
Color:			* HDHR MEDIUM DENSITY FO * REMOVABLE SEAT CUSHIC *	
FABRIC SPECIFICATION:	FABRIC #	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer:				
Name:				
Number:				
Color: Content:				
Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item:	0 0	0 0	0	
Total Yardage: Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
FABRIC P.O. Number				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00 \$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:	<u>.</u>	Date:
				Date:
				Dute.

PROJECT NAME:	Hotel Sandford		<u>PLAN:</u>	NA
ITEM CODE:	F-45		ROOM:	Activities Room
ITEM:	Armoire		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	3			
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.:	NA			
Description:	Wood Armoire with Mirror		Quantity:	1
Size: Material: Color:	46"W x 18"D x 6'-3"H		Notes: * COMMERCIAL GRADE MAT * HDHR MEDIUM DENSITY FO * REMOVABLE SEAT CUSHIC	DAM
			*	
FABRIC SPECIFICATION:	FABRIC #	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Vote: Cleaning Code: Yardage Per Item: Total Yardage: Cost per yard: Total Cost: FABRIC SWATCH:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00		-	
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford F-46		PLAN:	NA Roof Deck
ITEM:	Patio Dining Chair		ROOM: REVISED:	Noor Book
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Caluco		P.O. Number:	
Model No.: Description:	777-1 + Seat Cushion C777-1 Florence Dining Arm Chair with	seat cushion	Quantity:	4
Size: Material:	25" x 26"		Notes: * COMMERCIAL GRADE MAT	ERIALS ONLY
Color:			* HDHR MEDIUM DENSITY FO * REMOVABLE SEAT CUSHIC *	DAM
FABRIC SPECIFICATION:	FABRIC # 22	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name:	Caluco			
Number:	5606			
Color: Content:	Davidson Redwood			
Finish:				
Width:				
Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage:	0 0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00 \$0.00			
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN:	
ITEM CODE:	F-47		ROOM: REVISED:	Roof Deck
ITEM:	Patio Dining Table		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	63%	36		
Manufacturer:	By Owner (Existing)		P.O. Number:	
Model No.: Description:	NA Wrought Iron Dining Table with	Glass Top	Quantity:	1
Size:	42"Dia		Notes:	
Material:	42 Dia		*	
Calan			*	
Color:			*	
FABRIC SPECIFICATION:	FABRIC #	FABRIC#	FABRIC#	FINISH/WOOD:
Manufacturer:				
Name:				
Number: Color:				
Content:				
Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
FABRIC SWATCH:	•		****	
<u>FABRIC</u> P.O. Number				
SPECIAL				
	DELIVER TO			
Furniture Unit Cost: Total Furniture:	\$0.00 \$0.00			
Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-48 Side Table		PLAN: ROOM: REVISED:	NA Roof Deck
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Caluco		P.O. Number:	
Model No.: Description:	777-E Fluorence Square End Table		Quantity:	2
Size:	21" x 21" x 21"H		Notes:	
Material:			*	
Color:			*	
FABRIC SPECIFICATION:	FABRIC #	FABRIC#	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Cleaning Code:				
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

			<u> </u>	
PROJECT NAME: ITEM CODE:	Hotel Sandford F-49		PLAN ROOM	NA Roof Deck
ITEM:	Lounge Chair		ROOM REVISED	: ROOI DECK
PHOTO/ DESCRIPTION				
IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	Caluco 777-21 + (seat and back cushi	on) C777 21	P.O. Number:	
Description:	Fluorence Club Chair	011) 6777-21	Quantity:	6
Size: Material:	30"W x 33"D x 34"H, 14"SH		Notes:	
Color:			*	
FABRIC SPECIFICATION:	FABRIC # 22	FABRIC #	FABRIC #	FINISH/WOOD:
Manufacturer: Name:	Caluco			
Number:	5606			
Color:	Davidson Redwood			
Content:				
Finish: Width:				
Repeat:				
Technical Data:				
Note:				
Cleaning Code:	0	^	0	
Yardage Per Item: Total Yardage:	0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
<u>FABRIC</u> <u>SWATCH:</u>				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL	DEL II /ED TO			
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
<u>Total Furniture:</u> <u>Total Fabric Cost:</u>	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED:	,,,,,,,			
DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
DATE REVISED: Klang & Associates App	nroval:	Client Review:		Date:
g / iscoorates App	· - 			
				Date:
				I

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-50 Patio Coffee Table		PLAN: ROOM: REVISED:	NA Roof Deck
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Caluco		P.O. Number:	
Model No.: Description:	777-F Fluorence Coffee Table		Quantity:	1
•				'
Size: Material:	42" x 21" x 18"H		Notes:	
Color:			* * * *	
FABRIC SPECIFICATION:	FABRIC#	FABRIC#	FABRIC#	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content:				
Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code:			_	
Yardage Per Item: Total Yardage: Cost per yard: Total Cost:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

K&A FABRIC MASTER

PROJECT NAME: Canyon Club Clubhouse DESIGNER: DATE: MODIFICATIONS COAFOLLOW-UP RESELECTS

FABRIC MFG NAME Pindler & Pindler VENDOR / SHIP TO QTY RA EA COST TTL COST FABRIC MFG NAME Pindler & Pindler \$ - 0 \$ - 0 \$ - 0 \$ - 0 PATTERN Vellout 9134 COLOR Loden \$ 0 \$ 0 \$ 0 WIDTH / REPEAT 54" RESERVE INFO # \$ 0 \$ 0 \$ 0 \$ 0	PO#					
ION VENDOR/SHIP TO QTY RM	TTL COST	\$	- \$	- \$	- \$	- \$
ION VENDOR/SHIP TO QTY RM	EA COST	- \$				
NOI	RM					
NOI	QTY					
FABRIC MFG NAME Pindler & Pindler PATTERN Vellout 9134 COLOR Loden WIDTH / REPEAT 54" RESERVE INFO #	VENDOR / SHIP TO					
	FABRIC INFORMATION	FABRIC MFG NAME Pindler & Pindler	PATTERN Vellout 9134	COLOR Loden	WIDTH / REPEAT 54"	RESERVE INFO #

ABRIC #	FABI	FABRIC INFORMATION	VENDOR / SHIP TO	QTY	EA COST	RM EACOST TTL COST	#Od	
	FABRIC MFG NAME Concertex	Concertex			- \$	*		
	PATTERN Veritas	Veritas			- \$	\$		
ผ	COLOR Brisque	Brisque			- \$	\$		
	WIDTH / REPEAT 54'	54"			- \$	\$		
	RESERVE INFO #					- \$		To See See See See See See See See See Se

	3% 3%			ಎರಡಿ ಎರಡಿ	100 Told 100
*O					
TTL COST	- \$	- \$	- \$	- \$	- \$
RM EA COST TTL COST	- \$				
RM					
ALÒ					
VENDOR / SHIP TO QTY					
FABRIC INFORMATION	FABRIC MFG NAME Robert Allen Contract	PATTERN Scroll Squared	COLOR Chili	WIDTH / REPEAT 54"	RESERVE INFO #
FABRIC #			6)	

FABRIC INFORMATION VENDOR / SHIP TO QTY RA EA COST TTL COST PO# BRIC MFG NAME Michael Johns Durables \$ - 0 \$						
VENDOR/SHIP TO QTY	#Od					
VENDOR/SHIP TO QIY	TSO2 TTT	- \$	- \$	- \$	- \$	- \$
VENDOR/SHIP TO QIY	EA COST	- \$				
	RM					
	QTY					
BRIC MFG NAME Michael Johns Durables PATTERN Perfecto COLOR Honey WIDTH / REPEAT 54" RESERVE INFO #	VENDOR / SHIP TO					
	FABRIC INFORMATION	FABRIC MFG NAME Michael Johns Durables	PATTERN Perfecto	COLOR Honey	WIDTH / REPEAT 54"	RESERVE INFO #

FO#					
LSO2 TLL	- \$	- \$	- \$	- \$	- \$
RM EACOST TTL COST	- \$	- \$			
RM					
QTY					
VENDOR / SHIP TO QTY					
FABRIC INFORMATION	FABRIC MFG NAME Duralee Metro Chenille	PATTERN 90642	COLOR 623 Mink	WIDTH / REPEAT 54"	, INFO #
	FABRIC MF	P.		WIDTH / 1	RESERVE INFO #
FABRIC #			L	•	

Klang Associates FURNITURE SPECIFICATIONS K&A FABRIC MASTER

PROJECT NAME: Canyon Club Clubhouse	DESIGNER:	DATE:
COA	MODIFICATIONS	
FOLLOW-UP	RESELECTS	

FABRIC #	FABRIC INFORMATION	VENDOR /	VENDOR / SHIP TO QTY	QTY	RM	EA COST	RM EA COST TTL COST	#Od	
	FABRIC MFG NAME Fabricut					- \$	- \$		
	PATTERN Armstrong					- \$	- \$		
_	COLOR Grenadine					- \$	- \$		
	WIDTH / REPEAT 54"					- \$	- \$		
	RESERVE INFO #						- \$		

#Od					
TTL COST		- \$	- \$	- \$	- \$
RM EACOST TTL COST	-				
RM					
YTĢ					
VENDOR / SHIP TO QTY					
FABRIC INFORMATION	FABRIC MFG NAME Fabricut	PATTERN Gemini	COLOR Grenadine	WIDTH / REPEAT 54"	RESERVE INFO #
FABRIC #	FAE	(<u> </u>	м)	R

FABRIC #	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	EA COST	RM EACOST TTL COST	#Od	
	FABRIC MFG NAME Pindler & Pindler				\$	- \$		
	PATTERN Velluto					- \$		
0	COLOR Antique					*		
١	WIDTH / REPEAT $_{54}$ "					- \$		
	RESERVE INFO #					- \$		

Te (S	2000	To See	Ş		(
#Od					
TTL COST	- \$	- \$	- \$	- \$	- \$
RM EACOST TTL COST	- \$	- \$			
QTY					
VENDOR / SHIP TO QTY					
FABRIC INFORMATION	ME Loom Source	PATTERN Signature	COLOR Vine	AT 54"	# C
F/	FABRIC MFG NAME Loom Source	PATTE	COL	WIDTH / REPEAT 54"	RESERVE INFO #
FABRIC #			10		

Klang Associates FURNITURE SPECIFICATIONS K&A FARRIC MASTER

PROJECT NAME: Canyon Club Clubhouse	DESIGNER:	DATE:
COA	MODIFICATIONS	
FOLLOW-UP	RESELECTS	

FABRIC #	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	EA COST	RM EA COST TTL COST	PO#	ACCOUNT OF
	FABRIC MFG NAME Robert Allen				- \$	- \$		
	PATTERN Umma Shawl					- \$		10 C 3 C 3 C 3 C 3 C 3 C 3 C 3 C 3 C 3 C
11	COLOR Truffle					- \$		
	$\text{WIDTH / REPEAT} _{55}\text{"}$					- \$		
	RESERVE INFO #					- \$		

FABRIC #	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	EA COST TTL COST	TTL COST	#Od	
	FABRIC MFG NAME Robert Allen				- \$	- \$		
	PATTERN Broken Circles				- \$	- \$		
12	COLOR Tulip				- \$	- \$		
	WIDTH / REPEAT 58"				\$	- \$		
	RESERVE INFO #					*		

FABRIC #	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	RM EACOST TTL COST	TTL COST	FO#		
	FABRIC MFG NAME Fabricut				\$	- \$			
	PATTERN Brashares-F					- \$			
7	COLOR Red Pepper					- \$			
•	WIDTH / REPEAT 54"					- \$			
	RESERVE INFO #					- \$			

#					
#Od					
T COST	-	-	1	1	•
TT .	\$	*	\$	\$	*
RM EACOST TTL COST	\$	\$			
RM					
QTY					
VENDOR / SHIP TO QTY					
FABRIC INFORMATION	NAME Kravet	PATTERN 29744	COLOR 4	EPEAT 55"	NFO #
	FABRIC MFG NAME Kravet	PAT	ŭ	WIDTH / REPEAT 55"	RESERVE INFO #
FABRIC #			<u></u>)	

Klang Associates

K&A FABRIC MASTER	PROJECT NAME: Canyon Club Clubhous	NS □ DESIGNER :	DATE:
K&A	COA	MODIFICATIONS	
	FOLLOW-UP	RESELECTS	

FABRIC #	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	EA COST	RM EA COST TTL COST	FO#	
	FABRIC MFG NAME Concertex				*	- \$		
_	PATTERN Veritas					- \$		
16	COLOR Bordeaux					- \$		
)	WIDTH / REPEAT 54"					- \$		
	RESERVE INFO #					- \$		

RM EACOST TTL COST PO# STREET S	- \$ -	- \$	- \$	- \$	- *
RM EA CO	\$				
QTY					
VENDOR / SHIP TO QTY					
FABRIC INFORMATION	ME Fabricut	PATTERN Hanabi	COLOR Autumn Glow	AT	#(
FA	FABRIC MFG NAME Fabricut	PATTER	ОТОО	WIDTH / REPEAT	RESERVE INFO #
FABRIC #		(×)	

FABRIC #	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	RM EACOST TTL COST	TTL COST	#Od	
	FABRIC MFG NAME Fabricut				\$	- \$		
	PATTERN Altitude					- \$		
10	COLOR Grenadine					- \$		
\	WIDTH / REPEAT $_{54}$ " (19.5"V, 6.75"H)					- \$		
	RESERVE INFO #					- \$		
								(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)

					No. 10 No
#Od					
TL COST	- \$	- \$	- \$	- \$	- \$
RM EACOST TTL COST	- \$	- \$			
RM					
ALÒ					
VENDOR / SHIP TO					
FABRIC INFORMATION	E Duralee	PATTERN Faux Leather 14108	COLOR 582 Saddle	T 54"	#
FAI	FABRIC MFG NAME Duralee	PATTER	ЮТОО	WIDTH / REPEAT 54"	RESERVE INFO #
FABRIC #			20)	

Klang Associates FURNITURE SPECIFICATIONS K&A FABRIC MASTER

PROJECT NAME: Canyon Club Clubhouse	DESIGNER:	DATE:
COA	MODIFICATIONS	
FOLLOW-UP	RESELECTS	

	FAB	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	RM EACOST TTL COST	TTL COST	#Od
FABRIC	FABRIC MFG NAME Douglas	Douglas				\$	- \$	
	PATTERN	PATTERN Marbella 1265-650					- \$	
	COLOR Lima	Lima					- \$	
WIDT	WIDTH / REPEAT 54'	54"					- \$	
RESE	RESERVE INFO #						- \$	

FABRIC #	FABI	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	EA COST	RM EACOST TTL COST	#Od	
	FABRIC MFG NAME Caluco	Caluco				- \$	- \$		
	PATTERN 5606	9099				- \$	- \$		
	COLOR	COLOR Davidson Redwood				- \$	- \$		
	WIDTH / REPEAT					- \$	- \$		
	RESERVE INFO #						- \$		
l									

FABRIC #	FABRIC MFG NAME PATTERN	FABRIC INFORMATION AME TERN	VENDOR / SHIP TO QIY	QTY	RM	EA COST	RM EACOST TTL COST	PO#	
•	COLOR								•
	WIDTH / REPEAT						\$		
	RESERVE INFO #						- \$		

FABRIC #	FABF	FABRIC INFORMATION	VENDOR / SHIP TO QTY	QTY	RM	RM EACOST TTL COST	TTL COST	PO#
	FABRIC MFG NAME					- \$	\$	
	PATTERN						\$	
24	COLOR						\$	
	WIDTH / REPEAT						*	
	RESERVE INFO #						*	

FABRIC INFORMATION	IATION	VENDOR / SHIP TO QTY	VIQ	EA COST	RM EA COST TTL COST	#O4
FABRIC MFG NAME					- *	
PATTERN				\$	- \$	
COLOR					- \$	
WIDTH / REPEAT					- \$	
RESERVE INFO #					- \$	

Klang Associates

		NITUDE ODECITICATIONS	
	KLANG & ASSOCIATES	FF&E BUDGET 8	SUMMARY
	Interior Design 2748 Loker Ave West, C	arlsbad CA, 92010 P: 760	.438.1144
	Hotel Sandford	Location:	San Diego CA
	Area / Unit Type	Date:	11.8.2010
ITEM CODE	DESCRIPTION	QTY	NOTES
	Residential Unit		
F-1	Bed Frame with storage (Twin)	100	
F-1b	Mattress (Twin)	100	
F-2	Bed Frame (Full)	30	
F-2b	Mattress & Boxspring (Full)	30	
F-3	Night Stand	130	
F-4	Chair	130	
	Chair Fabric		
F-5	Dresser	97	
F-5b	Dresser (Reuse Existing)	30	
F-5c	Dresser (Reuse Existing)	1	
F-5d	Dresser (Reuse Existing)	1	
F-5e	Dresser (Reuse Existing)	1	
AC-1	TV	65	
AC-2	Lamp	130	

			<u> </u>	
PROJECT NAME: ITEM CODE:	Hotel Sandford F-1		PLAN:	NA Residential Unit
ITEM:	Twin Bed Frame		ROOM:	Residential Offic
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL	710 2 61 4			
PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No:	Coaster 400220		P.O. Number:	
Description:	Platform Bed Base with storag	е	Quantity:	100
Size:	Twin		Notes:	
Material/ Finish:	wood		*	
			*	
FABRIC	FABRIC # 1	FABRIC # 2	* FABRIC #	FABRIC #
SPECIFICATION:	FABRIC#1	FABRIC# 2	FABRIC#	FABRIC#
Manufacturer:				
Name: Number:				
Color:				
Content:				
Finish:				
Width:				
Repeat: Technical Data:				
roommour Duta.				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage:	0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH				
<u>SWATCH:</u>				
<u>FABRIC</u> P.O. Number				
SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00			
DATE ISSUED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
DATE REVISED: Klang & Associates App	l proval:	Client Review:		Date:
				Date:
				-

PROJECT NAME:	Hotel Sandford		PLAN	<u>:</u> NA
ITEM CODE: ITEM:	F-1b Twin Mattress		ROOM REVISED	: Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Coaster		P.O. Number:	
Model No:	1091T	Anttro on	O. antitu	20
Description:	Twin Copper firm innerspring N	าสเมษรร.	Quantity:	30
Size: Material:	Twin		Notes:	
. Materiai:			*	
Color:			*	
FABRIC SPECIFICATION:	FABRIC # 1	FABRIC # 2	FABRIC #	FABRIC #
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code:				
Yardage Per Item: Total Yardage:	0 0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00 \$0.00	
Total Cost: FABRIC SWATCH:	\$0.00	\$0.00	\$0.00	
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-2 Full Bed Frame		PLAN: ROOM: REVISED:	NA Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	Fine Furniture		7	
Manufacturer:	Coaster		P.O. Number:	
Model No.:	1204	livetek le		20
Description:	Full Size, 4 Leg Bed Frame, ac	Justable	Quantity:	30
Size: Material:	Metal		Notes:	
Color:			*	
<u>FABRIC</u>	FABRIC # 1	FABRIC # 2	FABRIC #	FINISH/WOOD:
SPECIFICATION:				
Manufacturer:				
Name: Number:				
Color:				
Content:				
Finish:				
Width:				
Repeat:				
Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
FABRIC	φυ.υυ	φυ.υυ	\$0.00	
SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL	DELIVED TO			
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
<u>Total Furniture:</u> <u>Total Fabric Cost:</u>	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00 \$0.00			
DATE ISSUED:				
DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-2b Full Mattress & Box		PLAN ROOM REVISED	Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Coaster		P.O. Number:	
Model No.: Description:	1091F + 1090F (Boxspring) Full Copper firm innerspring M	attress.	Quantity:	30
Size: Material:	Full / Double		Notes:	
Color:				
FABRIC SPECIFICATION:	FABRIC # 1	FABRIC # 2	FABRIC #	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data:				
Note:				
Cleaning Code: Yardage Per Item: Total Yardage: Cost per yard: Total Cost: FABRIC SWATCH:	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	0 0 \$0.00 \$0.00	
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	proval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE:	Hotel Sandford F-3		PLAN: ROOM: REVISED:	NA Residential Unit
ITEM:	Night Stand		REVISED:	
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Coaster		P.O. Number:	
Model No.: Description:	201572 Temre 3-drawer Nightstand		Quantity:	130
Size:	29"W x 17"D x 29"H		Notes:	
Material / Finish:	Cappuccino		*	
			*	
			*	
FABRIC SPECIFICATION:	FABRIC # 6	FABRIC # 7	FABRIC # 8	FINISH/WOOD:
Manufacturer: Name: Number:				
Color: Content:				
Finish: Width: Repeat:				
Technical Data:				
Note:				
Cleaning Code:	0	0	0	
Yardage Per Item: Total Yardage:	0 0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME:	Hotel Sandford		PLAN	
ITEM CODE: ITEM:	F-4 Chair		ROOM REVISED	: Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	Chair		KEVIOLD	•
Manufacturer: Model No.:	Vendor of Choice Custom		P.O. Number:	
Description:	Lounge Chair to match image		Quantity:	130
Size: Material: Color:	30"W x 30"D x 38"H, 18"SH Upholstered with wood feet		Notes: * COMMERCIAL GRADE MA * HDHR MEDIUM DENSITY I	TERIALS ONLY
FABRIC	FABRIC #	FABRIC #	FABRIC # 8	FINISH/WOOD:
SPECIFICATION: Manufacturer:	Douglas			
Name:	Marbella			
Number:	1265-650			
Color:	Lima			
Content:	90%Poly, 10%Rayon			
Finish:	Teflon			
Width:	54"			
Repeat:	13.5"V, 13.75"H			
Technical Data:	30,000D.R.			
Note:				
Cleaning Code:	0	0	0	
Yardage Per Item: Total Yardage:	0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:	STON			
FABRIC	dies dies			
P.O. Number	die			
P.O. Number SPECIAL INSTRUCTIONS	DELIVER TO			
P.O. Number SPECIAL INSTRUCTIONS Furniture Unit Cost:	\$0.00			
P.O. Number SPECIAL INSTRUCTIONS			TOTAL ITEM COST:	\$0.00
P.O. Number SPECIAL INSTRUCTIONS Furniture Unit Cost: Total Furniture: Total Fabric Cost:	\$0.00 \$0.00	MODIFICATION	TOTAL ITEM COST: ADD SERVICE	\$0.00
P.O. Number SPECIAL INSTRUCTIONS Furniture Unit Cost: Total Furniture: Total Fabric Cost: Total Pillows Cost: DATE ISSUED: DATE REVISED:	\$0.00 \$0.00 \$0.00 \$0.00			1

PROJECT NAME:	Hotel Sandford F-5		PLAN:	NA Residential Unit
ITEM:	Dresser		ROOM: REVISED:	Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	Coaster		P.O. Number:	
Description:	201576 TV Dresser		Quantity:	97
Size:	48"W x 18"D x 40"H		Notes:	
Material / Finish:	Cappuccino		*	
			*	
			*	
FABRIC SPECIFICATION:	FABRIC # 6	FABRIC # 7	FABRIC # 8	FINISH/WOOD:
Manufacturer: Name: Number:				
Color:				
Content:				
Finish: Width:				
Repeat:				
Technical Data:				
Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage:	0 0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> <u>P.O. Number</u>				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00		_	
Total Furniture: Total Fabric Cost: Total Pillows Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-5b Reuse Dresser		PLAN: ROOM: REVISED:	NA Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer: Model No.:	By Owner (existing) NA		P.O. Number:	
Description:	3-4 Drawer Dresser without mir	ror	Quantity:	30
Size:	42"W x 21"D x 3'H		Notes:	
Material / Finish:	Wood with wood knobs		*Refinishing Required *	
			*	
FABRIC	FABRIC # 6	FABRIC # 7	FABRIC # 8	FINISH/WOOD:
SPECIFICATION:				
Manufacturer:				
Name: Number:				
Color:				
Content:				
Finish:				
Width:				
Repeat: Technical Data:				
reciiiicai Data.				
Note:				
Cleaning Code:				
Yardage Per Item:	0	0	0	
Total Yardage: Cost per yard:	0 \$0.00	0 \$0.00	0 \$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
FABRIC B O Number				
P.O. Number SPECIAL				
INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00 \$0.00			
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ROOM: ITEM CODE: **Residential Unit** F-5c ITEM: REVISED: **Reuse Dresser** PHOTO/ **DESCRIPTION** IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: By Owner (existing) P.O. Number: Model No.: Description: Quantity: 4 Drawer Dresser with Mirror 39"W x 22"D x 36"H (mirror 3'H) Size: Notes: Material: Wood * Touch up finish as needed FABRIC # 6 FABRIC #7 FINISH/WOOD: FABRIC #8 **FABRIC SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 **Total Furniture:** \$0.00 **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 **Total Pillows Cost:** \$0.00 **DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: **Hotel Sandford** PLAN: NA ROOM: ITEM CODE: **Residential Unit** F-5d ITEM: REVISED: **Reuse Dresser** PHOTO/ **DESCRIPTION** IMAGE FOR CONCEPTUAL **PURPOSES ONLY** (SHOWS STYLE) Manufacturer: By Owner (existing) P.O. Number: Model No.: NA Description: Quantity: 4 Drawer Dresser with Mirror 45"W x 20"D x 30"H (mirror 3'H) Size: Notes: Material / Finish: Wood * Touch up finish as needed FABRIC # 6 FABRIC # 7 FINISH/WOOD: FABRIC #8 **FABRIC SPECIFICATION:** Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item: 0 0 0 Total Yardage: 0 0 0 Cost per yard: \$0.00 \$0.00 \$0.00 Total Cost: \$0.00 \$0.00 \$0.00 **FABRIC** SWATCH: **FABRIC** P.O. Number **SPECIAL** INSTRUCTIONS **DELIVER TO** Furniture Unit Cost: \$0.00 **Total Furniture:** \$0.00 **TOTAL ITEM COST:** \$0.00 **Total Fabric Cost:** \$0.00 \$0.00 **Total Pillows Cost: DATE ISSUED: MODIFICATION** ADD SERVICE RESELECT **DATE REVISED: DATE REVISED:** Klang & Associates Approval: Client Review: Date: Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford F-5e Reuse Dresser		PLAN: ROOM: REVISED:	NA Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	5			
Manufacturer:	By Owner (existing)		P.O. Number:	
Model No.: Description:	NA 6 Drawer Dresser with Mirror		Quantity:	1
Size: Material / Finish:	36"W x 20"D x 48"H Wood		Notes: * Existing mirror to be removed * Refinish as necessary * *	ı
FABRIC	FABRIC # 6	FABRIC # 7	FABRIC # 8	FINISH/WOOD:
SPECIFICATION:				
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code:		0	0	
Yardage Per Item: Total Yardage:	0 0	0 0	0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00 \$0.00		<u> </u>	
DATE ISSUED: DATE REVISED: DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
Klang & Associates App	roval:	Client Review:		Date:
				Date:

PROJECT NAME: ITEM CODE: ITEM:	Hotel Sandford AC-1 TV		PLAN: ROOM: REVISED:	NA Residential Unit
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)	VICIE	65:		
Manufacturer:	Viore		P.O. Number:	
Model No.: Description:	LC19VH54PB 19" Flat Screen TV on Stand, with HDMI input		Quantity: 65	
		пын прис		55
Size: Material:	18.1" x 13.6" x 5.5"		Notes:	
Color:			* *	
FABRIC SPECIFICATION:	FABRIC # 6	FABRIC # 7	FABRIC # 8	FINISH/WOOD:
Manufacturer: Name: Number: Color: Content: Finish: Width: Repeat: Technical Data: Note: Cleaning Code: Yardage Per Item:	0	0	0	
Total Yardage:	0	0	0	
Cost per yard: Total Cost:	\$0.00 \$0.00	\$0.00 \$0.00	\$0.00 \$0.00	
FABRIC SWATCH:				
<u>FABRIC</u> P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00			•
Total Furniture: Total Fabric Cost:	\$0.00 \$0.00 \$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost: DATE ISSUED:	\$0.00			
DATE REVISED: DATE REVISED:	rovali	MODIFICATION Client Boxing	ADD SERVICE	RESELECT
Klang & Associates App	rovai:	Client Review:		Date:
				Date:

DDO IECT NAME.	Haral Octable		DI AI	AL. ALA
PROJECT NAME: ITEM CODE:	Hotel Sandford AC-2		<u>PLAI</u> ROOM	N: NA M: Residential Unit
ITEM:	Table Lamp		ROOM REVISEI	D:
PHOTO/ DESCRIPTION IMAGE FOR CONCEPTUAL PURPOSES ONLY (SHOWS STYLE)				
Manufacturer:	Steinworld		P.O. Number:	
Model No.:	95655		Over tite v	400
Description:	Copper Ribbed Gourd Lamp		Quantity:	130
Size:	30.5"H		Notes:	
Material:			*	
Color:			*	
FABRIC	FABRIC # 6	FABRIC # 7	* FABRIC # 8	FINISH/WOOD:
SPECIFICATION:	. 7.5	. 7.5.1.5 # 1	TABLE OF C	
Manufacturer:				
Name:				
Number:				
Color: Content:				
Content:				
Finish:				
Width:				
Repeat: Technical Data:				
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Note:				
Cleaning Code:				
Yardage Per Item: Total Yardage:	0	0 0	0 0	
Cost per yard:	\$0.00	\$0.00	\$0.00	
Total Cost:	\$0.00	\$0.00	\$0.00	
<u>FABRIC</u> <u>SWATCH:</u>				
SWATCH:				
FABRIC				
P.O. Number				
SPECIAL INSTRUCTIONS	DELIVER TO			
Furniture Unit Cost:	\$0.00		·	
<u>Total Furniture:</u> Total Fabric Cost:	\$0.00		TOTAL ITEM COST:	\$0.00
Total Pillows Cost:	\$0.00 \$0.00			
DATE ISSUED:	Ţ2.0 0			
DATE REVISED:		MODIFICATION	ADD SERVICE	RESELECT
DATE REVISED: Klang & Associates App	proval:	Client Review:		Date:
a noovoidies App		S.O. R. R. O. FIGHT.		
				Date:

Klang & Associates **Specifications Hotel Sandford** PROJECT NAME: PLAN: NA ITEM: **Cabinetry Hardware** Kitchens, Vending Built-in ROOM: & Coffee Bar Built-in DRAWING LOCATION Elevations: 1-4, 6,7,9,10 & 14 REFERENCE: **REVISED:** PHOTO/ EQ. EQ. E. **DESCRIPTION** EQ. Ö Hardware Location Reference Manufacturer: House of Knobs (or equivalent) P.O. Number: HOK-22183 Model No.: Description: Pull Hardware with flared ends Quantity: TBD 5 1/4" L x 1/4"W (3 3/4" centers) Size: Material: Metal Hardware * Hardware to be installed horizontally on drawers and vertically on cabinet doors. Finish: BZ-21 Oil Rubbed Bronze *One piece of hardware per drawer or door. * All substitutions to be approved by Client or Architect **DATE: 2.14.11**

	Klang & Asso Specificati		
PROJECT NAME:	Hotel Sandford	PLAN:	NA
ITEM:	Cabinetry Shelving	ROOM:	Kitchens, Vending Built-in & Coffee Bar Built-in
REFERENCE:	N Elevations: 1-4, 6,7,9,10 & 14	REVISED:	
PHOTO/ DESCRIPTION			
Manufacturer:	Roseburg (or equivalent)	P.O. Number:	
Manufacturer: Model No.:	Roseburg (or equivalent) NA	P.O. Number:	
		P.O. Number: Quantity:	TBD
Model No.:	NA		TBD
Model No.: Description:	NA Regional Design Collection	Quantity:	
Model No.: Description:	NA Regional Design Collection Cut to fit per cabinetry x (1/2" Thick)	Quantity: Notes: * All exposed edges to	

Klang & Associates **Specifications** PROJECT NAME: **Hotel Sandford** PLAN: NA Kitchens, Vending Built-in ITEM: **Cabinetry Doors & Drawers** & Coffee Bar Built-in & ROOM: Computer Room CPU DRAWING LOCATION Elevations: 1-4, 6,7,9,10, 14, 16 & 17 Tower Doors REFERENCE: **REVISED:** PHOTO/ **DESCRIPTION**



Cabinetry Style



(Laminate Finish)

Manufacturer:	Custom- to match Aristocraft (or equivalent)	P.O. Number:
Model:	Nantucket Cabinet Door	
Description:	Square with raised center panel	Quantity: TBD
Size:	5/8" Plywood within	Notes:
	(height & width TBD per elevations and site verifications)	* All hinges to be concealed
		* All substitutions to be approved by Client or Architect
Material:	Full Overlay Laminate Door	* All Base / kicks of the cabinets to be finished to match the cabinets
Finish:	PLAM-1	
	(Nevamar, Regency Mahogany, Velvit, W8352V)	
		DATE: 2.14.11

PHOTO/ DESCRIPTION





Manufacturer:	Widget (widgetco.com) (or equivalent) 1-250-ATQ-S (Pin) & 1-250-ATQ-S (Sleeve)	P.O. Number:
Description:	Shelf Pins & Sleeves	Quantity: TBD
Size:	1/4"	Notes: * Within cabinetry, holes for pins to be drilled at 3"
Material:	Metal	height intervals
Finish:	Antique Brass	* Each shelf to be held up with 4 pins (one located at each corner)
		* All substitutions to be approved by Client or Architect
		DATE: 2.14.11

Klang & Associates **Specifications Hotel Sandford** PROJECT NAME: PLAN: NA ITEM: **CPU Tower Lock** Computer Room ROOM: DRAWING LOCATION Elevations: 16 & 17 REFERENCE: **REVISED:** PHOTO/ **DESCRIPTION** LOCK APPLICATION CAM DIMENSIONS MOUNTING HOLES FOR CAM LOCKS .760 3 DIA. MIN. DIA. OVERLAY Wood Metal Manufacturer: National Cabinet Lock (thehardwarehut.com) P.O. Number: (or equivalent) Quantity: 5 Model: NCL-C8060-14A-KA413A Description: National Disc Tumbler Cylinder Cam Lock Size: Cylinder Length: 1 3/4" * All substitutions to be approved by Client or Architect Maximum Material Thickness: 1 7/16" Material: Metal Finish: Nickel **DATE: 2.14.11**

Klang & Associates Specifications						
PROJECT NAME:	Hotel Sandford	PLAN:	NA			
ITEM:	CPU Tower Grill	ROOM:	Computer Room			
DRAWING LOCATION	Sheet: ID6.1 Letter "E"					
REFERENCE: REVISED:						

PHOTO/ DESCRIPTION



Manufacturer: Model:	Brass Elegans, Inc. (thehardwarehut.com) (or equivalent) BRE-116G-DBZ	P.O. Number:
Description:	Solid Brass Air Return Grille (comes with mounting screws)	Quantity: 5
Size:	Opening:10" x 6" (1/8" Projection) Overall: 7" x 11"	Notes:
Material:	Brass	*Each tower to have incorporated grill on an exposed side panel
Finish / Color:	Dark Bronze	*Grill to be installed vertically * All substitutions to be approved by Client or Architect
		DATE: 2.14.11

Klang & Associates **Specifications Hotel Sandford** PROJECT NAME: PLAN: NA ITEM: **CPU Tower Grommet** Computer Room ROOM: DRAWING LOCATION Sheet: ID6.1 Letter "E" REFERENCE: **REVISED:** PHOTO/ **DESCRIPTION** Manufacturer: Bainbridge (thehardwarehut.com) (or equivalent) P.O. Number: Model: Description: Quantity: 5 Bainbridge two piece Grommet with removable cover plate Size: 3"Overall Diameter 2 3/16" Inside Diameter *Grommet to be installed on counter surface directly above built-in CPU Tower to allow for wiring 2 1/2" Dia Rough opening Material: Plastic * All substitutions to be approved by Client or Architect Finish / Color: Black DATE: 2.14.11

| REVISED: | REVISED:

PHOTO/ DESCRIPTION



Magazine rack



Newspaper Sticks (shown with 5 deep angled)

Magazine Sticks

Conceptual Image

Manufacturer:	Custom (Newspaper Rack within Library Built-in)	P.O. Number:			
	Newspaper Sticks to match: Gaylord				
Model:	WW-666 (with rubber rings WW-667)	Quantity: 5 sticks			
Description:	Standard Newspaper Stick				
	(Holds 6 sections of the paper)	Notes:			
	Stick has 6 wedge-shaped sections that are drawn	*Note: All custom millwork for Library built-in to be:			
	together with the rubber rings	, , , , , , , , , , , , , , , , , , , ,			
Size:	35"L x 7/8" Dia with 5" Long handle	*Constructed of solid hard wood (Alder)			
	(custom size to coordinate with Elevation # 11)	*Dovetail Joint Construction			
Material:	Solid Alder Wood	*Minimum 1/2"Thick shelving			
Finish / Color: Note:	Stained to match existing lobby reception desk per drawing notes Sticks to set into notched side panels as shown in conceptual image above	*Site measurements required prior to any Custom millwo construction * All substitutions to be approved by Client or Architec			
		DATE: 2.14.11			

Klang & Associates **Specifications Hotel Sandford** PROJECT NAME: PLAN: NA ITEM: L-1 Art Light ROOM: Library DRAWING LOCATION Elevation # 11 REFERENCE: **REVISED:** PHOTO/ **DESCRIPTION** Mahogany Bronze Finish Manufacturer: House of Troy (lightinguniverse.com) P.O. Number: Model: 4347893 Quantity: 3 Description: House of Troy Wire Picture Artwork Light Fixture 14"W x 2"H x 7.5" Projection Size: Wiring: Hard Wired *Builder to provide J-box and necessary wiring per drawings Voltage: 120 Volt Finish: Mahogany Bronze * All substitutions to be approved by Client or Architect DATE: 2.14.11

| REVISED: | REVISED:

PHOTO/ DESCRIPTION



Manufacturer:	Lamps Plus	P.O. Number:
Model:	10839	Quantity: 3
Description:	Beaux Arts Rust Finish Plug-in Pendant Wall Sconce	
Size:	12"H, 9 1/4"Projection, 6"x6"Shade, (backplate 6 3/4"x4")	Notes:
Wiring:	use optional converter to hardware lamp	*Builder to provide J-box and necessary wiring per
Voltage:	60watt candelabra bulb	drawings
Finish:	amber glass with antique rust metal finish as shown	* All substitutions to be approved by Client or Architect
		DATE: 2.14.11

SCS ENGINEERS















Asbestos and Lead Paint Survey

Assessor's Parcel Number 533-453-03 1301 to 1333 Fifth Avenue and 518 A Street San Diego, California

Presented to:

SAN DIEGO HOUSING COMISSION

1122 Broadway, 5th Floor San Diego, California 92101 (619) 578-7587

Presented by:

SCS ENGINEERS

8799 Balboa Avenue, Suite 290 San Diego, California 92123 (858) 571-5500

February 25, 2010 Project Number: 01209275.00

Offices Nationwide www.scsengineers.com

February 25, 2010

Project Number: 01209275.00

Mr. Roger Green Real Estate Manager San Diego Housing Commission 1122 Broadway, 5th Floor San Diego, California 92101

Subject:

Asbestos and Lead Paint Survey (Survey)

Site:

Assessor's Parcel Number (APN) 533-453-03 1301 to 1333 Fifth Avenue and 518 A Street

1301 to 1333 Fifth Avenue and 518 A Str

San Diego, California

Dear Mr. Green:

SCS Engineers (SCS) is pleased to present this letter report (Report) of the Survey conducted for the above-referenced Site. This Report summarizes the results of services conducted to assess the presence of asbestos and lead paint in building materials and painted surfaces that may be affected by proposed renovation activities at the Site building. This Survey was performed by SCS in general accordance with the executed San Diego Housing Commission Agreement for Services, Materials, Supplies or Consulting (Contract) between the San Diego Housing Commission (Client) and SCS. The Contract was fully executed on January 20, 2010.

Should you have any questions regarding this Report, please do not hesitate to call the undersigned at (858) 571-5500.

Sincerely

Cristobal A. Ramirez

AHERA Building Inspector #BI-14883

Staff Professional

SCS ENGINEERS

Ryan T. Marcos

Certified Asbestos Consultant #90-2759

Project Manager

SCS ENGINEERS

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- Figure 2 Asbestos and Lead Paint Sample Location Map
- Figure 3 Asbestos and Lead Paint Sample Location Map

Appendices

Laboratory Report and Chain-of-Custody Documentation
Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling report by
SCS Engineers, dated August 30, 2009

1 BACKGROUND

SCS understands that the Site consists of approximately 0.34 acre of land in San Diego, California. SCS understands that the Site is currently developed with a four-story (130-room) hotel building, which was reported constructed circa 1914 (and renovated circa 1989). The Site building is reported to encompass approximately 63,682 square feet. The building is reportedly constructed over a basement, which encompasses 18,275 square feet. SCS understands that the Client is proposing to purchase the Site and renovate the building. Proposed renovation plans for the building are limited to the installation of new flooring materials, the installation of new restroom fixtures, the painting of interior and exterior walls and ceilings, window upgrades, partial structural improvements, and the installation of a new roof.

SCS previously completed a report (Report) entitled, *Phase I Environmental Site Assessment* (Assessment) and Limited Asbestos and Lead Paint Sampling (Sampling), Assessor's Parcel Number (APN) 533-453-03, 1301 to 1333 Fifth Avenue and 520 A Street, San Diego, California, which was dated August 30, 2009.

As indicated in the above-referenced report, SCS previously conducted limited Sampling activities in connection with the Site. Sampling limitations were as follows:

- Only readily accessible suspect asbestos-containing materials (ACMs) and asbestos-containing construction materials (ACCMs) were sampled as part of these limited sampling activities (i.e., destructive or intrusive sampling techniques were minimized).
- Bulk samples of flooring material were collected until the substrate was reached (e.g., concrete, wood, etc.). SCS did not conduct visual or sampling activities beneath this substrate.
- SCS only had access to a limited number of units within the Site building (12 units) and collected only a limited number of samples (30 samples for suspect ACMs and ACCMs, and 10 samples for suspect lead-based paint [LBP]). Therefore, additional ACMs, ACCMs, and LBPs may be present in other units or within wall or attic spaces, plenums, mechanical systems, etc., that were not accessible during this Survey.
- As indicated above, sampling of suspect materials followed a limited protocol and included 30 asbestos samples, with one sample per homogeneous material. Under such a limited sampling protocol, negative results may be misleading and further sampling would be required in order to classify a material as non asbestos-containing under EPA guidelines.

Based on the limited Sampling activities, the laboratory reported the following materials to contain asbestos and the following painted surfaces to contain lead:

• Black roof mastic, roof (10% Chrysotile asbestos)

- Brown 9" x 9" vinyl composition tiles, second floor of 1311 Fifth Avenue (6% Chrysotile asbestos)
- White paint on main wood door of Unit 308 (355 milligrams per kilogram [mg/kg] of lead)
- White paint on east metal walls of roof building (1,250 mg/kg of lead)
- White paint on exterior stucco of roof building (7,870 mg/kg of lead)
- White paint on wood window frames of roof building (33,700 mg/kg of lead)
- Light brown paint on plaster wall of 1311 Fifth Avenue (412 mg/kg of lead)

The Report provided the following recommendations in connection with additional Sampling activities:

Prior to renovation and/or demolition, we recommend that a more comprehensive
asbestos and lead survey should be conducted to characterize building suspect materials
and painted surfaces within the Site building that may be disturbed during proposed
renovation activities.

The Environmental Protection Agency (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires an inspection for asbestos on facilities which are to undergo demolition or renovation work. Materials found to contain asbestos may need to be removed prior to the start of demolition or renovation work. In addition, painted surfaces in poor condition (e.g., loose, flaking not adhered to the substrate) known to contain lead may need to be properly stabilized and/or abated and disposed of prior to demolition.

Based on the above-referenced recommendation and the proposed renovation activities for the Site, the Client requested and SCS conducted a more comprehensive Survey, which is described in this Report.

2 ASSUMPTIONS

For the purposes of preparing this proposal, the following assumptions were used:

• Proposed renovation plans for the Site building are limited to the installation of new flooring materials, the installation of new restroom fixtures, the painting of interior and exterior walls and ceilings, window upgrades, partial structural improvements, and the installation of a new roof. With respect to suspect asbestos-containing materials, with the possible exception of the roof and window putty, the exterior of the Site building will not be affected by proposed renovations. Therefore, with the exception of the roof and window putty, no samples of exterior materials were sampled.

• SCS has assumed that only surfaces that contain lead paint in poor condition (i.e., loose and flaking, not adhered to the substrate) require abatement. Therefore, SCS only sampled paint in poor condition. Painted surfaces in good condition, which may or may not contain lead, will not be disturbed (i.e., just painted over).

3 OBJECTIVES

The objectives of the scope of services were to:

- Assess the possible presence and type of asbestos-containing materials (ACMs), whose asbestos content is equal to or greater than 1 percent (by weight), and asbestos-containing construction materials (ACCMs), whose asbestos content is equal to or greater than 0.1 percent (by weight) in readily accessible building materials at the Site building.
- Assess the possible presence of lead-based paint (LBP), where lead content is equal to or greater than 5,000 milligrams per kilogram (mg/kg) in readily accessible areas where painted surfaces are in poor condition (e.g., loose, flaking, not adhered to substrate) at the Site building.

4 SCOPE OF SERVICES

ASBESTOS AND LEAD PAINT SURVEY

Introduction

This Survey was designed to identify ACMs, ACCMs, and LBPs at the Site building proposed to be renovated. Mr. Cristobal A. Ramirez supervised by Mr. Ryan T. Marcos of SCS conducted the Survey on January 21 and February 23, 2010, in general accordance with current California regulations. Mr. Ramirez is an Asbestos Hazards Emergency Response Act (AHERA) Building Inspector and Contractor Supervisor. Mr. Marcos is an experienced Department of Occupational Safety and Health (DOSH) Certified Asbestos Consultant.

A visual inspection of the Survey area was conducted to determine representative suspect materials and homogeneous areas which are visually similar in color, texture, general appearance, and which were installed at the same time. Only materials which were accessible and/or exposed were inspected. For this Survey, the inspector listed materials found that are suspected of containing asbestos and gave a generic description of their location. The inspector also evaluated the overall condition of the materials and determined whether the materials were friable or non-friable by touching the material, where practicable.

In accessible areas where painted surfaces were observed to be in poor condition (i.e., loose, flaking, not adhered to the substrate), paint chip samples were collected and analyzed for total lead in general accordance with EPA Method 7420. Please note that samples were only collected from areas where painted surfaces were observed to be in poor condition. This Survey does not assess lead content in painted surfaces which were observed to be in fair or good condition (i.e., adhered to the substrate).

Site Information and Building Inspection

The following table provides limited descriptions of Site building. Please note that descriptions include information obtained through visual observations during the Survey and that no intrusive or destructive sampling techniques were used to verify assumed building and/or construction materials (i.e., based on SCS's experience, if the building looked to be of wood-framed construction, it was so noted).

Description	Interior Building Materials
This building was observed to be a four- story hotel building,	Walls and ceilings: White drywall and joint compound and white finish coat, gray plaster
which is wood-framed with stucco-covered	Floors:
exterior walls constructed over a concrete basement. The	Basement (Residential): Off-white 12" x12" vinyl composition tiles with yellow mastic and yellow carpet mastic
roof was observed to be wood-framed and covered with cap sheet. This building reportedly encompasses 63,682 square feet (SF) and the basement reportedly encompasses 16,275	Floor 1 (Retail): Brown 9" x 9" vinyl composition tiles with black mastic, light brown sheet vinyl with yellow mastic, tan 12" x 12" vinyl composition tiles with yellow mastic, light gray 12" x 12" vinyl composition tiles with yellow mastic, blue 12" x 12" vinyl composition tiles with yellow mastic, tan sheet vinyl with yellow mastic, light blue 12" x 12" vinyl composition tiles with yellow mastic, black 12" x 12" vinyl composition tiles with yellow mastic, white 12" x 12" vinyl composition tiles with yellow mastic, and carpet mastic
SF. The Site building was reportedly constructed circa 1914 and renovated circa 1989.	Floors 2, 3, and 4 (Residential): Off-white speckled 12"x12" vinyl composition tiles with yellow mastic, yellow square-pattern sheet vinyl with yellow mastic, white speckled flooring material with black mastic (beneath yellow square pattern sheet vinyl), white leveling material, off-white small square-pattern sheet vinyl with yellow mastic, yellow baseboard mastic, off-white 9" x 9" square-pattern sheet vinyl with yellow mastic, yellow 9" x 9" square-pattern sheet vinyl with yellow mastic, white speckled sheet vinyl with yellow mastic, and carpet mastic

5 FINDINGS

ASBESTOS SURVEY ANALYTICAL RESULTS

Bulk samples collected from Site building were delivered to Patriot Environmental Laboratory Services, Inc. for analysis of asbestos content. Bulk samples were analyzed using polarized light microscopy (PLM) and dispersion staining in accordance with the EPA Interim Method for the Determination of Asbestos in Bulk Samples (40 CFR 763, Subpart F, Appendix A). Analytical results are provided in the following table. The rows in bold represent materials in which asbestos was detected. Sample locations and ACM locations are depicted in figures 1 to 3.

Sample Number	Material	Sample Location	F/NF	Cond.	Qty. ¹ (SF)	Asbestos Analytical Results ²
1-1AB to 1-3AB	A: Off-white speckled 12"x12" vinyl composition tiles B: Yellow mastic	North area of room 201 (1-1), northeast area of room 201 (1-2), and northwest area of room 201 (1-3) ⁴	A: ND B: ND	Good	NA	A: ND B: ND
2-1 AB to 2-7 AB	A: White drywall B: White joint compound	West wall of room 201 (2-1), east wall of room 208 (2-2), north wall of room 210 (2-3), north wall of room 216 (2-4), east wall of room 306 (2-5), north wall of room 308 closet (2-6), and north wall of room 201 (2-7) 4	A: F ³ B: F ³	Good	NA	A: ND B: ND
3-1AB to 3-7AB	A: Yellow finish coat B: Gray plaster	South wall of room 201 (3-1), north wall of room 208 (3-2), south wall of room 208 (3-3), west wall of room 210 (3-4), south wall of room 306 (3-5), north wall of room 308 (3-6), and south wall of stairway third floor (3-7) 4	A: F ³ B: F ³	Good	NA	A: ND B: ND
4-1 ABCD to 4-3 ABCD	A: Yellow square-pattern sheet vinyl B: Yellow mastic C: White speckled flooring material D: Black mastic	West area of restroom of room 204 (4-1), west area of restroom of room 205 (4-2), and west area of restroom of room 206 (4-3)	A: F ⁵ B: NF C: NF D: NF	Good	NA	A: ND B: ND C: ND D: ND
5-1 to 5-3	White leveling material	North area of room 201 (5-1), south area of room 204 (5-2), and east area of room 206 (5-3)	F	Good	NA	ND
6-1AB to 6-3AB	A: Off-white small square- pattern sheet vinyl B: Yellow mastic	East area of restroom of room 208 (6-1), east area of restroom of room 233 (6-2), and north area of restroom of room 351 (6-3)	A: F ⁵ B: NF	Good	NA	A: ND B: ND
7-1 to 7-3	Yellow baseboard mastic	East area of restroom of room 208 (7-1), east area of restroom of room 213 (7-2), and east area of restroom of room 302 (7-3)	NF	Good	NA	ND
8-1AB to 8-3AB	A: Off-white 9" x 9" square- pattern sheet vinyl B: Yellow mastic	North area of restroom of room 220 (8-1), south area of restroom of room 302 (8-2), and east area of restroom of room 343 (8-3)	A: F ⁵ B: NF	Good	NA	A: ND B: ND
9-1AB to 9-3AB	A: Yellow 9" x 9" square-pattern sheet vinyl B: Yellow mastic	North area of restroom of room 232 (9-1), north area of restroom of room 308 (9-2), and north area of restroom of room 434 (9-3)	A: F ⁵ B: NF	Good	NA	A: ND B: ND

Sample Number	Material	Sample Location	F/NF	Cond.	Qty. ¹ (SF)	Asbestos Analytical Results ²
10-1AB to 10-3AB	A: White speckled sheet vinyl B: Yellow mastic	East area of restroom of room 236 (10-1 to 10-3)	A: F ⁵ B: NF	Good	NA	A: ND B: ND
11-1AB to 11-3AB	A: Gray/white sheet vinyl B: Yellow mastic	East area of restroom of room 247 (11-1 to 11-3)	A: F ⁵ B: NF	Good	NA	A: ND B: ND
12-1 to 12-3	Black backflashing material	North area of roof (12-1), east area of roof (12-2), and west area of roof (12-3)	NF	Good	NA	ND
13-1 to 13-3	Black mineral cap sheet	North area of roof (13-1), east area of roof (13-2), and west area of roof (13-3) ⁴	NF	Good	NA	ND
14-1 to 14-3	White window putty	North window of roof room (14-1) and west window of roof room (14-2 and 14-3) ⁴	F	Poor	6 windows	3% Chrysotile
15-1 to 15-3	Black roof mastic	Middle area of roof (15-1), northeast area of roof (15-2), and east area of roof (15-3) ⁴	NF	Good	50 SF	10% Chrysotile
16-1AB to 16-3AB	A: Off-white 12" x12" vinyl composition tiles B: Yellow mastic	Southwest area of laundry (16-1), south area of laundry (16-2), and north area of laundry (16-3) ⁴	A: NF B: NF	Good	NA	A: ND B: ND
17-1 to 17-3	Yellow carpet mastic	Basement (17-1 to 17-3)4	NF	Good	NA	ND
18-1AB to 18-5AB	A: White drywall B: White joint compound	East wall of 518 A Street (18-1), west wall of 1311 Fifth Avenue (18-2), north wall of 1321 Fifth Avenue (18-3), east wall of 1333 Fifth Avenue (18-4), and west wall of 1333 Fifth Avenue (18-5)	A: F ³ B: F ³	Good	NA	A: ND B: ND
19-1 to 19-3	Yellow baseboard mastic	East wall of 518 A Street (19-1), north wall of 518 A Street (19-2), and west wall of 1321 Fifth Street (19-3)	NF	Good	NA	ND
20-1 to 20-3	Yellow carpet mastic	Southeast area of 518 A Street (20-1), northeast area of 518 A Street (20-2), and southwest area of 518 A Street (20-3)	NF	Good	NA	ND
21-1 to 21-3	A: Brown 9" x 9" vinyl composition tiles B: Black mastic	Mezzanine of 1311 Fifth Avenue (21-1 to 21-34)	A: NF B: NF	Poor	250 SF	A: 6% Chrysotile B: ND
22-1 to 22-3	Gray 2' x 4' drop-in acoustical ceiling tiles	North area of 1311 Fifth Avenue (22-1), west area of 1311 Fifth Avenue (22-2), and south area of 1311 Fifth Avenue (22-3)4	F	Fair	NA	ND

Sample Number	Material	Sample Location	F/NF	Cond.	Qty. ¹ (SF)	Asbestos Analytical Results ²
23-1AB to 23-3AB	A: Light brown sheet vinyl B: Yellow mastic	East area of 1321 Fifth Avenue (23-1 to 23-3) 4	A: F ⁵ B: NF	Good	NA	A: ND B: ND
24-1 to 24-3	White 2' x 4' drop-in acoustical ceiling tiles	West area of 1321 Fifth Avenue (24-1), middle area of 1321 Fifth Avenue (24-2), and northeast area of 1321 Fifth Avenue (24-3)	F	Fair	NA	ND
25-1AB to 25-3AB	A: Tan 12" x 12" vinyl composition tiles B: Yellow mastic	Middle area of 1333 Fifth Avenue (25-1 to 25-34)	A: NF B: NF	Good	NA	A: ND B: ND
26-1AB to 26-3AB	A: Light gray 12" x 12" vinyl composition tiles B: Yellow mastic	West area of 1333 Fifth Avenue (26-1 to 26-34)	A: NF B: NF	Good	NA	A: ND B: ND
27-1AB to 27-3AB	A: Blue 12" x 12" vinyl composition tiles B: Yellow mastic	Middle area of 1333 Fifth Avenue (27-1 to 27-34)	A: NF B: NF	Good	NA	A: ND B: ND
28-1 to 28-3	Off-white 2' x 4' drop-in acoustical ceiling tiles	Northwest area of ceiling of 1333 Fifth Avenue (28-1) and north area of ceiling of 1333 Fifth Avenue (28-2 and 28-34)	F	Fair	NA	ND
29-1AB to 29-3AB	A: Tan sheet vinyl B: Yellow mastic	North area of restroom 1333 Fifth Avenue (29-1), northwest area of restroom 1333 Fifth Avenue (29-2), and northeast area of restroom 1333 Fifth Avenue (29-3)	A: F ⁵ B: NF	Good	NA	A: ND B: ND
30-1AB to 30-3AB	A: Light blue 12" x 12" vinyl composition tiles B: Yellow mastic	North area of 1315 Fifth Avenue (30-1), northeast area of 1315 Fifth Avenue (30-2), and northwest area of 1315 Fifth Avenue (30-3)	A: NF B: NF	Good	NA	A: ND B: ND
31-1AB to 31-3AB	A: Black 12" x 12" vinyl composition tiles B: Yellow mastic	Southwest area of storage room 1315 Fifth Avenue (31-1 to 31-3)	A: NF B: NF	Good	NA	A: ND B: ND
32-1AB to 32-3AB	A: White 12" x 12" vinyl composition tiles B: Yellow mastic	Southwest area of storage room of 1315 Fifth Avenue (31-1 to 31-3)	A: NF B: NF	Good	NA	A: ND B: ND
1-1 to 1-3	White window putty	East window of 4 th floor (1-1) ⁶ , north window of 4 th floor (1-2) ⁶ , and west window of 4 th floor (1-3) ⁶	F	Fair	NA	ND

Notes:

F/NF: Friable/non-friable

- 1: Total estimated quantity observed. Not to be relied upon for abatement bidding purposes.
- 2: Asbestos content as determined by polarized light microscopy (PLM) with dispersion staining as recommended by the Environmental Protection Agency (EPA).
- 3: Non-friable in current condition, but will be considered friable upon demolition.
- 4: Sample collected and analyzed during previous assessment activities conducted at the Site by SCS (*Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling*, dated August 30, 2009)
- 5: Paper beneath sheet vinyl is considered friable
- 6: Sample collected and analyzed during Survey activities conducted at the Site by SCS on February 23, 2010

ND: None detected NA: Not applicable SF: Square feet

The following condition types were used to assess the suspect materials:

Good: No damage or deterioration, material is intact and shows little or no signs of damage or deterioration, and/or no debris was present.

Fair: Moderate damage or deterioration, material is breaking up into layers or beginning to come loose from the substrate, there are small areas where the material is deteriorating, and/or minor debris may be present.

Poor: Severe damage or deterioration, the material is non-cohesive, pieces are dislodged and debris is evident, and/or non-friable material has become friable.

Access Limitations

Please note that only readily accessible suspect ACMs and ACCMs were sampled as part of this Survey (i.e., destructive or intrusive sampling techniques were minimized). The following examples of access limitations are provided below; however, please note that this is not a complete list:

- Bulk samples of flooring material were collected until the substrate was reached (e.g., concrete). SCS did not conduct visual or sampling activities beneath this substrate.
- Sample locations were limited (i.e., 3, 5, or 7 samples were collected for each homogeneous material). Therefore, if suspect material or material layering is present in areas where samples were not collected, they may have gone uncharacterized.

Please note that additional ACMs and ACCMs may be present within wall or attic spaces, plenums, mechanical systems, etc., that were not accessible during this Survey. Immediately prior to and/or during renovation activities, any suspect non-characterized building materials should be sampled and analyzed for asbestos content.

LEAD SURVEY ANALYTICAL RESULTS

During previous assessment activities (SCS, *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling*, dated August 30, 2009), SCS collected samples of suspect lead paint in poor condition (i.e., loose and flaking, not adhered to the substrate). In addition, SCS collected additional paint samples on February 23, 2010. Paint samples were placed in plastic Ziplock bags, labeled, and transported under chain of custody to Patriot Environmental Laboratory Services, Inc. Paint samples were analyzed for lead in general accordance with EPA Method 7420 and digested in general accordance with EPA Method 3050B. Please note that only those paint systems that were observed to be in poor condition (i.e., loose and flaking, not adhered to the substrate) at the time of the Survey were sampled.

Based on the results of this Survey, lead-based paint (LBP), as defined by Housing and Urban Development (HUD) (greater than or equal to 5,000 mg/kg) was detected in four painted surfaces sampled at the Site. There are four painted surfaces with less than 5,000 mg/kg reported, but greater than or equal to 600 mg/kg of lead content. As indicated above, California Occupational Health and Safety Act (Cal-OSHA) guidelines indicate that coatings or materials containing lead at concentrations equal to or exceeding 0.06 percent by weight or 600 milligrams per kilogram (mg/kg) may constitute a health hazard for employees engaged in lead-related construction work. Analytical results are provided in the following table. The rows in bold represent materials in which lead (more than 600 mg/kg) was detected.

Sample Number	Material Location / Sample Location	Color	Cond.	Lead Content (mg/kg)
L-1	Paint on wood/Main door Room 308	White	Good	355
L-2	Paint on metal/East wall of building at roof area	White	Good	1,250
L-3	Paint on stucco/East wall of building of roof area	White	Good	7,870
L-4	Paint on wood/East window in roof room	White	Good	33,700
L-5	Paint on drywall/North wall of basement	White	Good	ND
L-6	Paint on plaster/West wall of 1311 Fifth Avenue	Light brown	Good	412
L-7	Paint on drywall/West wall of 1311 Fifth Avenue	Tan	Good	ND

Note:

ND: None detected above the laboratory detection limit, which was established at 100 mg/kg.

mg/kg: milligram per kilogram

The following table summarizes the paint sampling activities conducted at the Site on February 23, 2010.

Sample Number	Material Location / Sample Location	Color	Cond.	Lead Content (mg/kg)
L-1	Paint on wood/West exterior window frame of 4 th floor	Gray	Poor	80,590
L-2	Paint on stucco/East exterior wall of building of 4th floor	White	Fair	ND

Sample Number	Material Location / Sample Location	Color	Cond.	Lead Content (mg/kg)
L-3	Paint on stucco/East wall of building of 4th floor	Gray	Good	174
L-4	Paint on stucco/South wall of building of 1st floor	Gray	Good	643
L-5	Paint on stucco/South wall of building of 1st floor	White	Good	23,200
L-6	Paint on wood/Door frame of south wall 1st floor	Dark gray	Poor	1,110
L-7	Paint on concrete/Ceiling and eave area of 1st floor	White	Poor	ND
L-8	Paint on wood/ Window frame of west wall 1st floor	White	Poor	1,770

Estimated ACM and LBP Removal Costs

Cost estimates for abatement of identified ACMs and lead paint are provided in the table below based on our experience and cost obtained from abatement contractors on periodic basis. Please note that figures presented below are cost estimates for removal and that they may vary according to bids received from abatement contractors, depending on their qualifications, experience, and level of work load. Therefore, these costs should only be used as a rough guide until actual costs can be obtained. Moreover, these costs assume that all ACMs and paints will be abated simultaneously or consecutively (i.e., requiring only one mobilization). Separate or non-consecutive removal of ACMs and lead containing paint from the Site buildings may increase unit removal costs. Prevailing wages were used in preparation of this estimate. Please note that prior to renovation activities, SCS will provide bidding Specifications to abatement contractors and obtain actual bids for abatement cost.

Material	Location	Total Estimated Quantity Observed 1	Unit Cost	Cost Estimate for Removal
White window putty	Roof room	6 windows	\$100/window	\$600
Black roof mastic	Roof	50 SF	\$3.50/SF	\$175
Brown 9" x 9" vinyl composition tiles	Mezzanine 1311 Fifth Avenue	250 SF	\$4.50/SF	\$1,125
White paint on metal	Exterior walls of roof	250 SF	\$1.50/SF	\$375
White paint on stucco	Exterior walls of roof room	200 SF	\$1.50/SF	\$300
White paint on wood	Window frames of roof room	6 windows	\$40/window	\$240
White paint on wood	Window frames of rooms on 4th floor	42 windows	\$40/window	\$1,680
Gray paint on stucco	Exterior walls (columns)	200 SF	\$1.50/SF	\$300
White paint on stucco	Exterior walls	500 SF	\$1.50/SF	\$750
Dark gray paint on wood	Window and doors frames on 1st floor	50 SF	\$1.50/SF	\$75

Material	Location	Total Estimated Quantity Observed 1	Unit Cost	Cost Estimate for Removal
White paint on wood	Window and doors frames on 1st floor	25 SF	\$1.50/SF	\$37.5
Cost Estimate	\$ 5,657.5			
20% Contingency Fo	\$1,131.5			
Total Cost Estimate	\$6,789			

Notes:

SF: Square feet

1: Approximation only - not to be relied on for bidding purposes.

6 GENERAL SUMMARY

By federal definition, any substance that contains more than one percent asbestos is classified as an asbestos containing material (ACM). California Code of Regulations 1529 defines asbestos-containing construction materials (ACCMs) as materials containing greater than or equal to one-tenth of one percent. Asbestos-containing materials are regulated by federal, state, and local agencies.

Friable ACMs are materials that can be crushed or pulverized by hand pressure when dry. Materials can also be rendered friable when subjected to crushing, sanding, sawing, shot blasting, or through demolition or renovation activities.

The EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires an inspection for asbestos to be performed on facilities which are to undergo renovation work. Materials found to contain asbestos may need to be removed prior to the start of such renovation work. In addition, painted surfaces in poor condition (e.g., loose and flaking, not adhered to the substrate) known to contain lead may need to be properly stabilized and/or removed, and disposed of prior to renovation activities.

7 CONCLUSIONS

ASBESTOS SURVEY

The following is a summary of asbestos-containing materials (ACMs) identified at the Site building:

Material	Location	F/NF	Cond.	Qty. ¹ (SF)	Asbestos Analytical Results ²
White window putty	Roof room	F	Poor	6 windows	3% Chrysotile
Black roof mastic	Roof	NF	Good	50 SF	10% Chrysotile
Brown 9" x 9" vinyl composition tiles	Mezzanine of 1311 Fifth Avenue	NF	Poor	250 SF	6% Chrysotile

Notes:

F/NF: Friable/non-friable

Cond.: Condition (good, fair, poor)

1: Total estimated quantity observed. Not to be relied upon for abatement bidding purposes.

2: Asbestos content as determined by polarized light microscopy (PLM) with dispersion staining as

recommended by the Environmental Protection Agency (EPA).

SF: Square feet

LEAD SURVEY

Based on the results of this Survey, lead-based paint (LBP), as defined by Housing and Urban Development (HUD) (greater than or equal to 5,000 mg/kg) was detected in four painted systems sampled at the Site. There are four painted surfaces with less than 5,000 mg/kg reported, but greater than or equal to 600 mg/kg of lead content. As indicated above, California Occupational Health and Safety Act (Cal-OSHA) guidelines indicate that coatings or materials containing lead at concentrations equal to or exceeding 0.06 percent by weight or 600 mg/kg may constitute a health hazard for employees engaged in lead-related construction work. Please note that only paint systems that were observed to be in poor condition (i.e., loose and flaking) were sampled. There may be additional LBP systems at the Site that were not sampled as part of this Survey.

8 RECOMMENDATIONS

The following recommendations are based on SCS's experience, laboratory results, and the assumption that the Site buildings have been scheduled for renovation.

ASBESTOS SURVEY

- Prior to being disturbed as a result of renovation activities, ACMs must be removed by a properly licensed abatement contractor. ACMs must be disposed of at an approved landfill.
- Asbestos abatement should be monitored by an independent third party. Third party
 monitoring is conducted to ensure documentation of the abatement activities and to
 limit the building owner's liabilities. Monitoring should include development of
 project specifications, visual inspections during and after the project, and air
 monitoring prior to, during, and at project completion to verify that the area is safe for
 re-occupancy or demolition.

LEAD SURVEY

• Based on SCS's review and interpretation of relevant Cal-OSHA guidelines, coating or materials containing lead at concentrations equal to or exceeding 0.06 percent by weight or 600 mg/kg are to be considered a potential health hazard for employees engaged in lead-related construction work. Therefore, SCS recommends that the painted surfaces in poor condition (i.e., loose, flaking, not adhered to substrate) with lead content greater to or equal to 600 mg/kg be stabilized and/or removed prior to renovation activities.

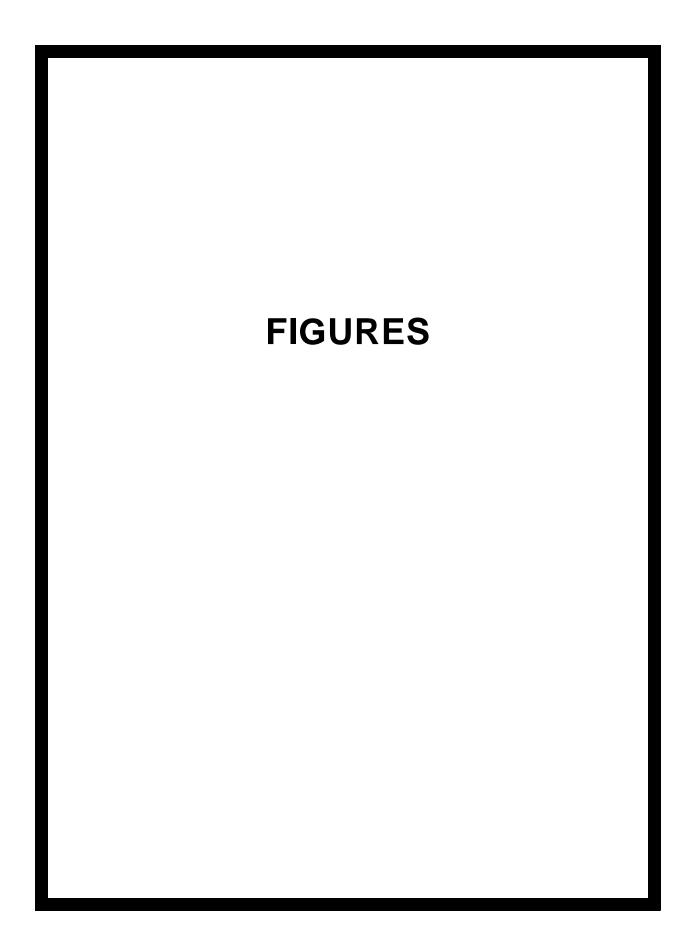
• If any lead is present in Site buildings paint surfaces, regardless of its concentration, the building renovation contractor must comply with OSHA regulations (Title 8, Section 1532.1) related to the demolition or salvage of structures where lead or materials containing lead are present.

9 REPORT USAGE AND FUTURE SITE CONDITIONS

This Report is intended for the sole usage of the Client and the parties designated by SCS. Use of this Report is subject to the provisions of the fully executed Contract between the Client and SCS. Any third party usage of this Report shall be subject to the provisions of the Contract and any unauthorized misuse of or reliance upon the Report shall be without risk or liability to SCS.

The conclusions of this Report are judged to be relevant at the time the work described in this Report was conducted.

Please note that this Report is predicated on a sampling program that included lead paint measurements and asbestos samples from a selected number of rooms and building materials (Sample). While Samples are intended to assess the possible presence of lead paint and asbestos in all rooms and building materials, it may not, due to limited access, heterogeneity of building materials, remodeling and rehabilitation/renovation of Site buildings. In addition, materials may have been inaccessible for sampling (e.g., materials hidden/enclosed behind walls or ceilings or samples that are not possible but for destruction of building materials, among other reasons). Therefore, the Client should recognize that SCS is only estimating the levels of asbestos and lead paint in building materials based on Sample results and that we may not have identified asbestos or lead paint in all building materials. An alternative approach is the invasive and destructive collection of material samples and lead paint readings from all room and building materials which most of our clients find to be cost prohibitive and impractical. SCS can provide you with a cost estimates for a more detailed or invasive sampling program.





22-3 Non-asbestos-containing sample location

Asbestos-containing brown 9" x 9" vinyl composition tile location

21-3* Asbestos-containing sample location.

Non-lead paint-containing sample location

- * indicates sample collected and analyzed during previous assessment activities conducted at the Site in August 2009.
- ** indicates sample collected and analyzed during assessment activities conducted at the Site on February 23, 2010.

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

Environmental Consultants 8799 Balboa Avenue, Suite 290 San Diego, California 92123

ASBESTOS AND LEAD PAINT SAMPLE LOCATION MAP

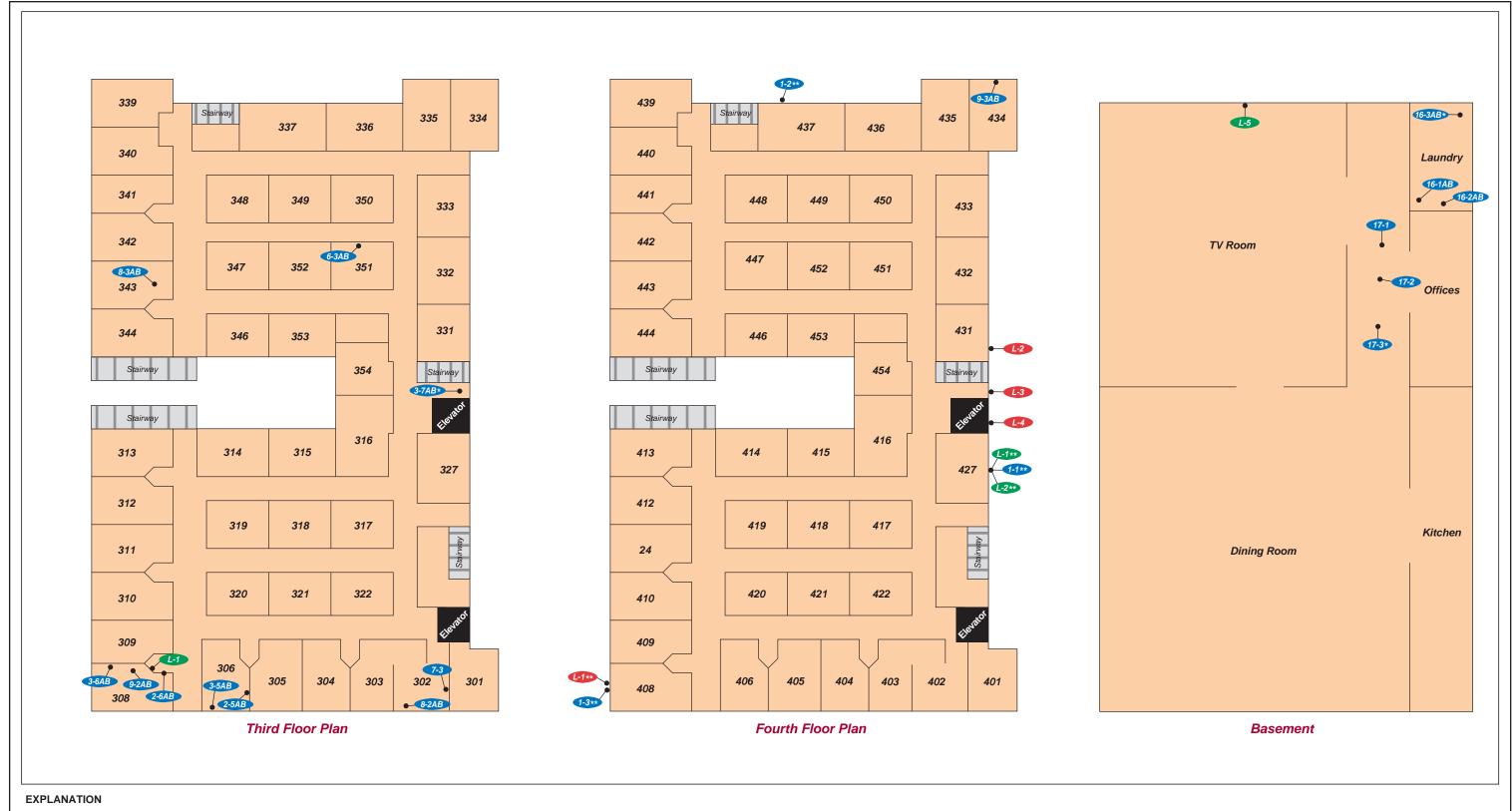
San Diego Housing Commission

1301 to 1323 5th Avenue and 518 A Street San Diego, California

Project No.: 01209275.00

Figure 1

Date Drafted: 2/19/10



7-3 Non-asbestos-containing sample location

1-1 Non-lead paint-containing sample location

Lead paint-containing sample location

- \star indicates sample collected and analyzed during previous assessment activities conducted at the Site in August 2009.
- $\star\star$ indicates sample collected and analyzed during assessment activities conducted at the Site on February 23, 2010.

Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.





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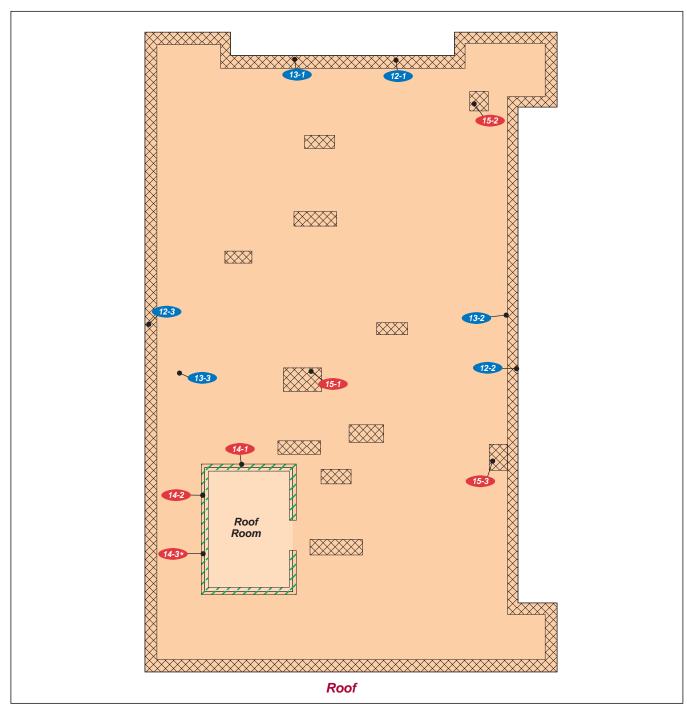
ASBESTOS AND LEAD PAINT SAMPLE LOCATION MAP

San Diego Housing Commission

1301 to 1323 5th Avenue and 518 A Street San Diego, California Project No.: 01209275.00

Figure 2

Date Drafted: 2/19/10



EXPLANATION

22-3 Non-asbestos-containing sample location



Non-lead paint-containing sample location



Asbestos-containing window putty



Asbestos-containing roof mastic-patches, roof eaves, and roof penetrations. Please note that roof mastic locations identified on this figure were based on limited observations during survey activities. If should be noted that there may be additional roof mastic elsewhere on the roof that were either not observed or not accessible.



Disclaimer: This figure is based on available data. Actual conditions may differ. All locations and dimensions are approximate.

SCS ENGINEERS

Environmental Consultants 8799 Balboa Avenue, Suite 290 San Diego, California 92123

ASBESTOS AND LEAD PAINT SAMPLE LOCATION MAP

San Diego Housing Commission 1301 to 1323 5th Avenue and 518 A Street San Diego, California Project No.: 01209275.00

Figure 3

Date Drafted: 2/19/10

ANALYTICAL DATA AND CHAIN-OF-CUSTODY DOCUMENTATION



7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841 Patriot Environmental Laboratory Services, Inc.

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010 Date Analyzed: 1/26/2010 Date Reported: 1/27/2010

Date Reported: 1/27/2010		PO		
Lab/Client ID/Layer	Location	Material Description	Color	Composition (%
369705-001 1-1A	N Area Room 201	12x12 Vinyl Composition Tiles	Off-white	78% Carbonate 22% Vinyl Binder
Total Asbestos	None Detected			
369705-002 1-1B	N Area Room 201	Mastic	Black	100% Tar
Total Asbestos	None Detected			
369705-003 1-2A	NE Area Room 201	12x12 Vinyl Composition Tiles	Off-white	78% Carbonate 22% Vinyl Binder
Total Asbestos	None Detected			
369705-004 1-2B	NE Area Room 201	Mastic	Black	100% Tar
Total Asbestos	None Detected			
369705-005 2-1A	W Wall Room 201	Drywall	White	96% Sulfate 4% Cellulose
Total Asbestos	None Detected			
369705-006 2-1B	W Wall Room 201	Joint Compound	White	93% Carbonate 7% Paint
Total Asbestos	None Detected			

Tel: 714.899.8900 Free: 888.743.0998 Fax: 714.899.7098 http://www.patriotlab.com

Patriot Environmental Laboratory Services, Inc. 7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
Date Analyzed: 1/26/2010
Date Reported: 1/27/2010

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-007 2-2A	E Wall Room 208	Drywall	White	94% Sulfate 4% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			
369705-008 2-2B	E Wall Room 208	Joint Compound	White	93% Carbonate 7% Paint
Total Asbestos	None Detected			
369705-009 2-3A	N Wall Room 210	Drywall	White	94% Sulfate 4% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			
369705-010 2-3B	N Wall Room 210	Joint Compound	White	92% Carbonate 8% Paint
Total Asbestos	None Detected			
369705-011 2-4A	N Wall Room 216	Drywall	White	95% Sulfate 5% Cellulose
Total Asbestos	None Detected			
369705-012 2-4B	N Wall Room 216	Joint Compound	White	93% Carbonate 7% Paint
Total Asbestos	None Detected			

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Patriot Environmental Laboratory Services, Inc. 7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-013 2-5A	E Wall Room 306	Drywall	White	91% Sulfate 9% Cellulose
Total Asbestos	None Detected			
369705-014 2-5B	E Wall Room 306	Joint Compound	White	92% Carbonate 8% Paint
Total Asbestos	None Detected			
369705-015 2-6A	N Wall Closet 308	Drywall	White	89% Sulfate 9% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			
369705-016 2-6B	N Wall Closet 308	Joint Compound	White	93% Carbonate 7% Paint
Total Asbestos	None Detected			
369705-017 3-1A	S Wall Room 201	Finish Coat	Yellow	83% Minerals 13% Carbonate 4% Paint
Total Asbestos	None Detected			
369705-018 3-1B	S Wall Room 201	Plaster	Beige	90% Minerals 10% Carbonate
Total Asbestos	None Detected			

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Project Location: 1301 5th Ave.

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Date Analyzed: 1/26/2010

Date Reported: 1/27/2010

Date Reported: 1/2//2010		PO Number:		
Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-019 3-2A	N Wall Room 208	Finish Coat	White	20% Minerals 65% Carbonate 15% Paint
Total Asbestos	None Detected			
369705-020 3-2B	N Wall Room 208	Plaster	Beige	91% Minerals 9% Carbonate
Total Asbestos	None Detected			
369705-021 3-3A	S Wall Room 208	Finish Coat	White	20% Minerals 65% Carbonate 15% Paint
Total Asbestos	None Detected			
369705-022 3-3B	S Wall Room 208	Plaster	Beige	90% Minerals 10% Carbonate
Total Asbestos	None Detected			
369705-023 3-4A	W Wall Room 210	Finish Coat	Yellow	83% Minerals 13% Carbonate 4% Paint
Total Asbestos	None Detected			
369705-024 3-4B	W Wall Room 210	Plaster	Beige	91% Minerals 9% Carbonate
Total Asbestos	None Detected			

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Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-025 3-5A	S Wall Room 306	Finish Coat	Yellow	83% Minerals 13% Carbonate 4% Paint
Total Asbestos	None Detected			
369705-026 3-5B	S Wall Room 306	Plaster	Beige	91% Minerals 9% Carbonate
Total Asbestos	None Detected			
369705-027 3-6A	N Wall Room 308	Finish Coat	Yellow	83% Minerals 13% Carbonate 4% Paint
Total Asbestos	None Detected			
369705-028 3-6B	N Wall Room 308	Plaster	Beige	90% Minerals 10% Carbonate
Total Asbestos	None Detected			
369705-029 4-1A	W Area RR 204	Sheet Vinyl	Yellow	12% Linoleum 60% Vinyl Binder 26% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			
369705-030 4-1B	W Area RR 204	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-031 4-1C	W Area RR 204	Flooring Material	White	70% Carbonate 30% Vinyl Binder
Total Asbestos	None Detected			
369705-032 4-1D	W Area RR 204	Mastic	Black	80% Tar 20% Cellulose
Total Asbestos	None Detected			
369705-033 4-2A	W Area RR 205	Sheet Vinyl	Yellow	12% Linoleum 60% Vinyl Binder 26% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			
369705-034 4-2B	W Area RR 205	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-035 4-2C	W Area RR 205	Flooring Material	White	70% Carbonate 30% Vinyl Binder
Total Asbestos	None Detected			
369705-036 4-2D	W Area RR 205	Mastic	Black	80% Tar 20% Cellulose
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-037 4-3A	W Area RR 206	Sheet Vinyl	Yellow	12% Linoleum 60% Vinyl Binder 26% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			
369705-038 4-3B	W Area RR 206	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-039 4-3C	W Area RR 206	Flooring Material	White	70% Carbonate 30% Vinyl Binder
Total Asbestos	None Detected			
369705-040 4-3D	W Area RR 206	Mastic	Black	80% Tar 20% Cellulose
Total Asbestos	None Detected			
369705-041 5-1	N Area Room 201	Leveling Material	White	94% Carbonate 6% Paint
Total Asbestos	None Detected			
369705-042 5-2	S Area Room 204	Leveling Material	White	94% Carbonate 6% Paint
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-043 5-3	E Area Room 206	Leveling Material	White	94% Carbonate 6% Paint
Total Asbestos	None Detected			
369705-044 6-1A	E Area RR 208	Sheet Vinyl	White	15% Linoleum 60% Vinyl Binder 25% Cellulose
Total Asbestos	None Detected			
369705-045 6-1B	E Area RR 208	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-046 6-2A	E Area RR 233	Sheet Vinyl	White	15% Linoleum 60% Vinyl Binder 25% Cellulose
Total Asbestos	None Detected			
369705-047 6-2B	E Area RR 233	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			

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N Area RR 351 None Detected	Material Description Sheet Vinyl	Color White	Composition (% 15% Linoleum 60% Vinyl Binder
	Sheet Vinyl	White	60% Vinyl Binder
None Detected			25% Cellulose
N Area RR 351	Mastic	Yellow	100% Binder
None Detected			
E Area RR 208	Baseboard Mastic	White	100% Binder
None Detected			
E Area RR 213	Baseboard Mastic	White	100% Binder
None Detected			
E Area RR 302	Baseboard Mastic	White	100% Binder
None Detected			
N Area RR 220	Sheet Vinyl	White	15% Linoleum 60% Vinyl Binder 22% Cellulose 3% Glass Fibers
None Detected			
	None Detected E Area RR 208 None Detected E Area RR 213 None Detected E Area RR 302 None Detected N Area RR 220	None Detected E Area RR 208 Baseboard Mastic None Detected E Area RR 213 Baseboard Mastic None Detected E Area RR 302 Baseboard Mastic None Detected None Detected None Detected N Area RR 220 Sheet Vinyl	None Detected E Area RR 208 Baseboard Mastic White None Detected E Area RR 213 Baseboard Mastic White None Detected E Area RR 302 Baseboard Mastic White None Detected None Detected None Detected Sheet Vinyl White

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Date Reported. 1/27/2010		10	PO Number.	
Lab/Client ID/Layer	Location	Material Description	Color	Composition (%
369705-054 8-1B	N Area RR 220	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-055 8-2A	S Area RR 302	Sheet Vinyl	White	15% Linoleum 60% Vinyl Binder 22% Cellulose 3% Glass Fibers
Total Asbestos	None Detected			
369705-056 8-2B	S Area RR 302	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-057 8-3A	E Area RR 343	Sheet Vinyl	White	15% Linoleum 60% Vinyl Binder 22% Cellulose 3% Glass Fibers
Total Asbestos	None Detected			
369705-058 8-3B	E Area RR 343	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			

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Date Reported: 1/27/2010		PO Number:		
Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-059 9-1A	N Area RR 232	9x9 Sheet Vinyl	Yellow	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-060 9-1B	N Area RR 232	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-061 9-2A	N Area RR 308	9x9 Sheet Vinyl	Yellow	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-062 9-2B	N Area RR 308	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-063 9-3A	N Area RR 434	9x9 Sheet Vinyl	Yellow	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-064 9-3B	N Area RR 434	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-065 10-1A	E Area RR 236	Sheet Vinyl	White Speckled	20% Linoleum 50% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-066 10-1B	E Area RR 236	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-067 10-2A	E Area RR 236	Sheet Vinyl	White Speckled	20% Linoleum 50% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-068 10-2B	E Area RR 236	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			

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Project Location: 1301 5th Ave.

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Date Analyzed: 1/26/2010

Date Reported: 1/27/2010

Claim Number:
Number of Samples: 167

Date Reported: 1/27/2010		PO		
Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-069 10-3A	E Area RR 236	Sheet Vinyl	White Speckled	20% Linoleum 50% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-070 10-3B	E Area RR 236	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-071A 11-1A	E Area RR 247	Sheet Vinyl	White Grey	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-071B 11-1A	E Area RR 247	Flooring Material	White	80% Carbonate 20% Vinyl Binder
Total Asbestos	None Detected			
369705-071BM 11-1A	E Area RR 247	Mastic	Black	100% Tar
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-072 11-1B	E Area RR 247	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-073A 11-2A	E Area RR 247	Sheet Vinyl	Grey White	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-073B 11-2A	E Area RR 247	Flooring Material	White	80% Carbonate 20% Vinyl Binder
Total Asbestos	None Detected			
369705-073BM 11-2A	E Area RR 247	Mastic	Black	100% Tar
Total Asbestos	None Detected			
369705-074 11-2B	E Area RR 247	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-075A 11-3A	E Area RR 247	Sheet Vinyl	Grey White	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-075B 11-3A	E Area RR 247	Flooring Material	White	80% Carbonate 20% Vinyl Binder
Total Asbestos	None Detected			
369705-075BM 11-3A	E Area RR 247	Mastic	Black	100% Tar
Total Asbestos	None Detected			
369705-076 11-3B	E Area RR 247	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-077 12-1	N Area of Roof	Backflashing Material	Black	65% Tar 8% Glass Fibers 27% Minerals
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-078 12-2	E Area of Roof	Backflashing Material	Black	65% Tar 8% Glass Fibers 27% Minerals
Total Asbestos	None Detected			
369705-079 12-3	W Area of Roof	Backflashing Material	Black	65% Tar 8% Glass Fibers 27% Minerals
Total Asbestos	None Detected			
369705-080 13-1	N Area of Roof	Mineral Cap Sheet	Black	67% Tar 8% Glass Fibers 25% Minerals
Total Asbestos	None Detected			
369705-081 13-2	E Area of Roof	Mineral Cap Sheet	Black	67% Tar 8% Glass Fibers 25% Minerals
Total Asbestos	None Detected			
369705-082 14-1	N Window of Roof Room	Window Putty	White	87% Binder 10% Paint
Chrysotile Total Asbestos	3 % 3 %			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-083 14-2	W Window of Roof Room	Window Putty	White	87% Binder 10% Paint
Chrysotile	3 %			
Total Asbestos	3 %			
369705-084 15-1	Middle Area Roof	Roof Mastic	Black	100% Foam
Total Asbestos	None Detected			
369705-085 15-2	NE Area Roof	Roof Mastic	Black	60% Foam 32% Tar 8% Cellulose
Total Asbestos	None Detected			
369705-086 16-1A	SW Laundry	12x12 Vinyl Composition Tiles	Off White	80% Carbonate 20% Vinyl Binder
Total Asbestos	None Detected			
369705-087 16-1B	SW Laundry	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-088 16-2A	S Laundry	12x12 Vinyl Composition Tiles	Off White	80% Carbonate 20% Vinyl Binder
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-089 16-2B	S Laundry	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-090 17-1	Basement	Carpet Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-091 17-2	Basement	Carpet Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-092 18-1A	E Wall 518 A St	Drywall	White	94% Sulfate 6% Cellulose
Total Asbestos	None Detected			
369705-093 18-1B	E Wall 518 A St	Joint Compound	White	97% Carbonate 3% Paint
Total Asbestos	None Detected			
369705-094 18-2A	W Wall 1311 5th	Drywall	White	94% Sulfate 6% Cellulose
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-095 18-2B	W Wall 1311 5th	Joint Compound	White	97% Carbonate 3% Paint
Total Asbestos	None Detected			
369705-096 18-3A	N Wall 1321 5th	Drywall	White	94% Sulfate 6% Cellulose
Total Asbestos	None Detected			
369705-097 18-3B	N Wall 1321 5th	Joint Compound	White	97% Carbonate 3% Paint
Total Asbestos	None Detected			
369705-098 18-4A	E Wall 1333 5th	Drywall	White	94% Sulfate 6% Cellulose
Total Asbestos	None Detected			
369705-099 18-4B	E Wall 1333 5th	Joint Compound	White	97% Carbonate 3% Paint
Total Asbestos	None Detected			
369705-100 18-5A	W Wall 1333 5th	Drywall	White	94% Sulfate 6% Cellulose
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-101 18-5B	W Wall 1333 5th	Joint Compound	White	97% Carbonate 3% Paint
Total Asbestos	None Detected			
369705-102 19-1	E Wall 518A St	Baseboard Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-103 19-2	N Wall 518A St	Baseboard Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-104 19-3	W Wall 1321 5th	Baseboard Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-105 20-1	SE Area 518 A St	Carpet Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-106 20-2	NE Area 518 A St	Carpet Mastic	Yellow	100% Binder
Total Asbestos	None Detected			

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Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-107 20-3	SW Area 518 A St	Carpet Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-108 21-1A	Mezzanine 1311 5th	9x9 Vinyl Composition Tiles	Brown	80% Carbonate 14% Vinyl Binder
Chrysotile Total Asbestos	6 % 6 %			
369705-109 21-1B	Mezzanine 1311 5th	Mastic	Black	100% Tar
Total Asbestos	None Detected			
369705-110 21-2A	Mezzanine 1311 5th	9x9 Vinyl Composition Tiles	Brown	80% Carbonate 14% Vinyl Binder
Chrysotile Total Asbestos	6 % 6 %			
369705-111 21-2B	Mezzanine 1311 5th	Mastic	Black	100% Tar
Total Asbestos	None Detected			

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Patriot Environmental Laboratory Services, Inc. 7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010

Date Analyzed: 1/26/2010

Date Reported: 1/27/2010

Claim Number:
Number of Samples: 167

Date Reported: 1/27/2010		PO		
Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-112 22-1	N Area 1311 5th	2x4 Ceiling Tile	Grey	23% Mineral Wool 65% Cellulose 12% Perlite
Total Asbestos	None Detected			
369705-113 22-2	W Area 1311 5th	2x4 Ceiling Tile	Grey	20% Mineral Wool 65% Cellulose 12% Perlite 3% Paint
Total Asbestos	None Detected			
369705-114 23-1A	E Area 1321 5th	Sheet Vinyl	Light Brown	12% Linoleum 57% Vinyl Binder 29% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			
369705-115 23-1B	E Area 1321 5th	Mastic	Yellow	100% Binder
Total Asbestos	None Detected			
369705-116 23-2A	E Area 1321 5th	Sheet Vinyl	Light Brown	12% Linoleum 57% Vinyl Binder 29% Cellulose 2% Glass Fibers
Total Asbestos	None Detected			

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Patriot Environmental Laboratory Services, Inc. 7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
Date Analyzed: 1/26/2010
Date Reported: 1/27/2010

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)		
369705-117 23-2B	E Area 1321 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-118 24-1	W Area 1321 5th	2x4 Acoustic Ceiling Tile	White Beige	70% Cellulose 20% Glass Fibers 7% Perlite 3% Paint		
Total Asbestos	None Detected					
369705-119 24-2	Middle Area 1321 5th	2x4 Acoustic Ceiling Tile	White Beige	70% Cellulose 20% Glass Fibers 7% Perlite 3% Paint		
Total Asbestos	None Detected					
369705-120 24-3	NE Area 1321 5th	2x4 Acoustic Ceiling Tile	White Beige	70% Cellulose 20% Glass Fibers 7% Perlite 3% Paint		
Total Asbestos	None Detected					
369705-121 25-1A	Middle Area 1333 5th	12x12 Vinyl Composition Tiles	Tan	78% Carbonate 22% Vinyl Binder		
Total Asbestos	None Detected					

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SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
Date Analyzed: 1/26/2010
Date Reported: 1/27/2010

				Composition (%)		
369705-122 25-1B	Middle Area 1333 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-123 25-2A	Middle Area 1333 5th	12x12 Vinyl Composition Tiles	Tan	78% Carbonate 22% Vinyl Binder		
Total Asbestos	None Detected					
369705-124 25-2B	Middle Area 1333 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-125 26-1A	W Area 1333 5th	12x12 Vinyl Composition Tiles	Light Gray	80% Carbonate 20% Vinyl Binder		
Total Asbestos	None Detected					
369705-126 26-1B	W Area 1333 5th	Mastic	c Yellow 1			
Total Asbestos	None Detected					
369705-127 26-2A	W Area 1333 5th	12x12 Vinyl Composition Tiles	Light Gray	80% Carbonate 20% Vinyl Binder		
Total Asbestos	None Detected					

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Patriot Environmental Laboratory Services, Inc. 7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
Date Analyzed: 1/26/2010
Date Reported: 1/27/2010

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)		
369705-128 26-2B	W Area 1333 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-129 27-1A	Middle Area 1333 5th 12x12 Vinyl Blue Composition Tiles		77% Carbonate 23% Vinyl Binder			
Total Asbestos	None Detected					
369705-130 27-1B			Mastic Yellow			
Total Asbestos	None Detected					
369705-131 27-2A	Middle Area 1333 5th	12x12 Vinyl Composition Tiles	Blue	77% Carbonate 23% Vinyl Binder		
Total Asbestos	None Detected					
369705-132 27-2B			Yellow	100% Binder		
Total Asbestos	None Detected					
369705-133 28-1	NW Ceiling 1333 5th	Acoustic Ceiling Tiles	Off White	20% Mineral Wool 65% Cellulose 12% Perlite 3% Paint		
Total Asbestos	None Detected					

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SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010

Date Analyzed: 1/26/2010

Date Reported: 1/27/2010

Date Reported: 1/2	7/2010	PO	Number:	
Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
369705-134 28-2	N Ceiling 1333 5th	Acoustic Ceiling Tiles	Off White	20% Mineral Wool 65% Cellulose 12% Perlite 3% Paint
Total Asbestos	None Detected			
369705-135A 29-1A	N Area RR 1333 5th	Sheet Vinyl	Tan	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			
369705-135B 29-1A	N Area RR 1333 5th	Flooring Material	White	80% Carbonate 20% Vinyl Binder
Total Asbestos	None Detected			
369705-136 29-1B			Yellow	100% Binder
Total Asbestos	None Detected			
369705-137A 29-2A	NW Area RR 1333 5th	Sheet Vinyl	Tan	15% Linoleum 55% Vinyl Binder 20% Cellulose 10% Glass Fibers
Total Asbestos	None Detected			

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SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
Date Analyzed: 1/26/2010
Date Reported: 1/27/2010

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)		
369705-137B 29-2A	NW Area RR 1333 5th	Flooring Material	White	80% Carbonate 20% Vinyl Binder		
Total Asbestos	None Detected					
369705-138 29-2B			Yellow	100% Binder		
Total Asbestos	None Detected					
369705-139A 29-3A	NE Area RR 1333 5th	Sheet Vinyl				
Total Asbestos	Not Tested					
369705-139B 29-3A	NE Area RR 1333 5th	Flooring Material	White	80% Carbonate 20% Vinyl Binder		
Total Asbestos	None Detected					
369705-140 29-3B	NE Area RR 1333 5th Mastic		Yellow	100% Binder		
Total Asbestos	None Detected					
369705-141 30-1A			Blue	77% Carbonate 23% Vinyl Binder		
Total Asbestos	None Detected					

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Patriot Environmental Laboratory Services, Inc. 7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
Date Analyzed: 1/26/2010
Date Reported: 1/27/2010

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)		
369705-142 30-1B	N Area 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-143 30-2A	NE Area 1315 5th	12x12 Vinyl Composition Tile	Blue	77% Carbonate 23% Vinyl Binder		
Total Asbestos	None Detected					
369705-144 30-2B	NE Area 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-145 30-3A	NW Area 1315 5th	NW Area 1315 5th 12x12 Vinyl B Composition Tile		77% Carbonate 23% Vinyl Binder		
Total Asbestos	None Detected					
369705-146 30-3B	NW Area 1315 5th	n Mastic Yellow		100% Binder		
Total Asbestos	None Detected					
369705-147 31-1A	SW Storage Room 1315 5th	12x12 Vinyl Composition Tile	Black	80% Carbonate 20% Vinyl Binder		
Total Asbestos	None Detected					

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SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010
Date Analyzed: 1/26/2010
Date Reported: 1/27/2010

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)		
369705-148 31-1B	SW Storage Room 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-149 31-2A	SW Storage Room 1315 5th	12x12 Vinyl Composition Tile	Black	80% Carbonate 20% Vinyl Binder		
Total Asbestos	None Detected					
369705-150 31-2B	SW Storage Room 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-151 31-3A	٤		Black	80% Carbonate 20% Vinyl Binder		
Total Asbestos	None Detected					
369705-152 31-3B	SW Storage Room 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-153 32-1A	SW Storage Room 1315 5th	12x12 Vinyl Composition Tile	White	76% Carbonate 24% Vinyl Binder		
Total Asbestos	None Detected					

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SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010

Date Analyzed: 1/26/2010

Date Reported: 1/27/2010

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)		
369705-154 32-1B	SW Storage Room 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-155 32-2A	SW Storage Room 1315 5th	12x12 Vinyl Composition Tile	White	76% Carbonate 24% Vinyl Binder		
Total Asbestos	None Detected					
369705-156 32-2B	SW Storage Room 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					
369705-157 32-3A	SW Storage Room 1315 5th	12x12 Vinyl Composition Tile	White	76% Carbonate 24% Vinyl Binder		
Total Asbestos	None Detected					
369705-158 32-3B	SW Storage Room 1315 5th	Mastic	Yellow	100% Binder		
Total Asbestos	None Detected					

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SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123 Report Number: 369705
Project Number: 01209275.00
Project Name: Sandford Hotel
Project Location: 1301 5th Ave.

Date Received: 1/26/2010

Date Analyzed: 1/26/2010

Date Reported: 1/27/2010

Claim Number:
Number of Samples: 167
PO Number:

Lab/Client ID/Layer Location Material Description Color Composition (%)

369705-139A No vinyl vheet flooring layer.

Bulk sample(s) submitted was (were) analyzed in accordance with the procedure outlined in the US Federal Register 40 CFR 763, Subpart F, Appendix A; EPA-600/R-93/116 (Method for Determination of Asbestos in Building Materials), and EPA-600/M4-82-020 (US EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples). Samples were analyzed using Calibrated Visual Estimations (CVES); therefore, results may not be reliable for samples of low asbestos concentration levels. Samples of wall systems containing discrete and separable layers are analyzed separately and reported as composite unless specifically requested by the customer to report analytical results for individual layers. This report applies only to the items tested. Results are representative of the samples submitted and may not represent the entire material from which the samples were collected. "None Detected" means that no asbestos was observed in the sample. "<1%" (less than one percent) means that asbestos was observed in the sample but the concentration is below the quantifiable level of 1%.

Elaine Wai - Analyst

Cristina E. Tabatt - Approved B

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PATRIOT ENVIRONMENTAL LABORATORY SERVICES, INC. Page / of 7

PATRIOT	•			Lab Use Only				
ENVIRONMENTAL LABORATORY STRVICES		atriotlab.c			Report N			
Client: SCS E	ngineers		Project #: 🛮 🖒 /	2092	75.0	٥		<u> </u>
	799 Balboa Ave.#	290	Project Name:	Sano	lford	d Hote	el	
Sa		Location: 130	01 5	th A	ve.			
Client Contact: C	1 1 1	rez.	Sample Collect	tion Date	e: 1/2	1/2010		
	858) 571-5500		Preservative:		•	,		
Contact Cell: (858) 401-2350		Authorized By:	Rvai	7.	Marco	2	
	858) 571- 5357		PO#:			Claim #:		
Special Instructions								
						_		
Analysis Red	uested		Turnaround T					<u> </u>
			Rush (Same Day)[⊒	-		
<u>Asbestos</u>			24HR	<u>_</u>	╡	(specify): _		
PCM (fiber count)	NIOSH 7400A	블	48HR			4		
PLM (bulk asbestos)	EPA 600/R-93/116		72HR		<u>ਪ</u>	<u> </u>		
	CARB 435	片	Moto CELOCALI	A/CT roquis	oo o mini	mum of 52 bro	turnaraun	.d
	Point Count 400 Point Count 1000		Note : -STLC/CAL N			hrs turnaround		u
	Gravimetric Reduction		-Cultures req				•	
Lead <i>by Flame AA</i>		/ina Wasta \					NIOSH	7082mod
Lead Waste Profile			* Note: Please					
	1: TTLC Total Threshold by 2: STLC/CAL WET Title 22 3: TCLP EPA 1311	EPA 3050B	mod Article 5 App 2	i 				,
Mold	Air Cassette		nd Identification Jony Enumeratio	าท	H			
pH testing (soils, n	niscellaneous solids, and liquid]					
Rotometer Calibra	ition					= :		
Sample ID	LAB Location	De	escription	Start	Stop	Flow Rate	Total	Volume (L)
	ID	- 75	e, dimensions, etc)	Time	Time	(LPM)	Min.	(Flow x Tot. Min)
1-1AB	Narea 100m 201	12"x12	thilespeckl "vinyl comp.+	ed iles				
1-2AB	NE area room 201		ow mastic					
2-1 AB	W wall room 201	4=Whil	e drywall					
2.2.AB	E Wall room 208	B= whi	te joint com	pound				
Relinquished By:	(Print) Cristobal A.	Ramin	2 Z (Sign)		lll	\	(Date)	1/25/2010
Received By:	(Print)		(Sign)			L	(Date)	/ '
Relinquished By:	(Print)		(Sign)			1	(Date)	
Received By:	(Print)		(Sign)	\overline{I}			(Date)	
Relinquished By:	(Print)		(Sign)				(Date)	
Received By:	(Print)		(Sign)				(Date)	

Page 2 of

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PATRIOT ENVIRONMENTAL LABORATORY SERVICES, INC.

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Report Number:

Sample ID LAB ID Location Description (Sample type, dimensions, etc) Time Time Time (LPM) Min. Flow Min. Min. Min. Flow Min. Min. Flow Min. Min. Min. Min. Min. Min. Min. Min.	
Sample ID LAB ID Location Description (Sample type, dimensions, etc) Time Time Time (LPM) Min. Flow Min. Min. Min. Flow Min. Min. Flow Min. Min. Min. Min. Min. Min. Min. Min.	
2.4AB N wall room 216 2.5AB E wall room 3 % 2.6AB N wall closet 308 3.1AB S wall room 201 A= Yellow finish coat N wall room 208 B= Gray plaster	ume (L) x Tot. Min)
2.5AB E wall room 3 %	
2-6 AB N wall closet 308 3-1 AB Swall room 201 A= Yellow finish coat 3-2 AB N wall room 208 B= Gray plaster	
3-1AB 5 wall room 201 A= Yellow finish coat 3-2AB N wall room 208 B= Gray plaster	
3.2AB N wall room 208 B= Gray plaster	
3.4AB W wall room 210	
3.5 AB S wall room 306	
3.4AB N wall room 308	
4-1ABCD Warearr 204 A=Yellow square pattern sheet viny!	
4-ZABCD Warea rr 205 B= rellow mastic c= white speckled flooring	
4-3 ABCD Warea rr 206 D= Block mastic	
5-1 N area room 201 white leveling	
5.2 Sarea room 204 material	
5.3 E area room 206	
Relinquished By: (Print) Cristobal A. Ramirez (Sign) Dun (Date) 1/25	1/2010
Received By: (Print) (Sign) (Date)	/ ~~ 19
Relinquished By: (Print) (Sign) (Date)	
Received By: (Print) (Sign) (Date)	
Relinquished By: (Print) (Sign) (Date)	
Received By: (Print) (Sign) (Date)	

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PATRIOT ENVIRONMENTAL LABORATORY SERVICES, INC.

CHAIN OF CUSTODY

Lab Use Only Report Number:

			ww.pati	Totiab.com			кероп	Number:		
Client: SCS	Enc	gineers			Project # 0/2	2092	75.00)		
Project Name:	Saño	dford Ho	te1		Location: /30	5 5	th A	ve.		
Sample ID	LAB ID	Location		Des (Sample type,	scription dimensions, etc)	Start Time	Stop Time	Flow Rate (LPM)	Total Min.	Volume (L) (Flow x Tot. Min)
6-1 AB		Earea RR 2	208	A= paffe	hite small in sheet v	squa nv/	re-			
6.2AB		E area RR			w mastic					
6-3AB		Nama RR	351	_						
7-1		E area KR :	208	Yellow L	baseboard					
7-2		e area RR	213	mastic	,				· · · · · · · · · · · · · · · · · · ·	
7-3		E area RR	_		,					
8-1 AB		Narea RR i	220	A: Off-wh A: pallerr	ile 9'x9" so sheet ving	uare-				
8-ZAB		S area RR.		B= Yellou	•					
8-3AB		E area RR	-	I		, in the second	_			
9-1AB		N area RR :	232	A=Yellow Daller	9'x9" squa 1 sheet vi	are- nyl				
9-2AB		N area RR	308		v mastic	1				
9.3AB	gi Lagar Africa Lagar Andria II	Narea RR.	434	1						
10-1AB		E area RR 7	234	A= white sheet	s peckled					
10-2 AB		/			w mastic					
10-3 AB				I	_					
11-1 AB	e was	Earea RR:	247	A= Gray sheet	/white /			7		
Relinquished By	: (Print)	Cristobal A	1. Ran	nirez	(Sign)	Di	us		(Date)	1/25/2010
Received By:	(Print)				(Sign)				(Date)	1 2 2 2 19
Relinquished By	/: (Print)				(Sign)				(Date)	
Received By:	(Print)				(Sign)	<i>l</i>			(Date)	
Relinquished By	/: (Print)				(Sign)				(Date)	
Received By:	(Print)				(Sign)				(Date)	

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PATRIOT ENVIRONMENTAL LABORATORY SERVICES, INC.

CHAIN OF CUSTODY

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Client: SCS	Enc	gineers	20927	5.00)				
		dford Hotel		Location: /30	1_5	th A	ve.		
Sample ID	LAB ID	Location		escription e, dimensions, etc)	Start Time	Stop Time	Flow Rate (LPM)	Total Min.	Volume (L) (Flow x Tot. Min)
11-2 AB			B= Yel	low mastic					
11-3 AB		T							
12-1		Narea of roof	Black	backflashi	19			<u> </u>	
12-2		E area of roof	mater	ial	<i>J</i> =				
12.3	400	Warea of roof	-	L					
13-1		Narea of roof	Black i	mineral cap	sheet				
13-2		E area of roof		1					
14-1		N window of roof room	white i	window puth	1				
14-2	one and the second	w window of roof room)	T					
15-1		Middle area roof	Black r	oof masfic					
15-2		NE area roof	_	L					
16-1AB	Lag of the	sw laundry	A= Off-will Comp	hite 12×12" u osition tiles	iny/				
16.2AB		,	•	w mastic					
17-1		Basement	Yellow	carpet mas	tic				
17-2		Ţ		T					
18-1 AB		E wall 518 Ast.		te drywall /					
Relinquished B	y : (Print)	Cristobal A. Rar	nirez	(Sign)	Pu	un		(Date)	1/25/2010
Received By:	(Print)			(Sign)				(Date)	
Relinquished B	y : (Print)		-	(Sign)				(Date)	
Received By:	(Print)			(Sign)	t 			(Date)	
Relinquished B	<u> </u>		· · · · · · · · · · · · · · · · · · ·	(Sign)				(Date)	
Received By:	(Print)			(Sign)				(Date)	

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	CHAIN OF CUS
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		- www.				report	10110011		
Client: SCS	Client: SCS Engineers Project # 01209275.00								
Project Name: Sandford Hotel Location: 1301 5th Ave.									
Sample ID	LAB ID	Location		escription e, dimensions, etc)	Start Time	Stop Time	Flow Rate (LPM)	Total Min.	Volume (L) (Flow x Tot. Min)
18-2AB		w wall 1311 5th	B= Whil	le joint con	poun	d			
18.3AB		N wall 13215th							
18-4AB	•	E wall 1333 5 th							
18-5 AB		w wall 1333 5th							
19 -1		E wall 518A st	Yellow	baseboard					
19.2		N wall 518Ast	mas tic) 					
19-3		W wall 13215th		<u></u>					
20-1		SE area 518ASt	Yellow	carpet ma	as fic			<u>. </u>	
20-2		Ne ana 518 Ast							
20.3		SW area 518 Ast		<u></u>					
21-1 AB		Mezzannine 1311 5			•	41/J			
21-2AB	lage of the	1	Viny l B= Black	comp. +1	les				
22-1		N area of 1311 5th	Gray 2	'x4' drop-1	n				
22-2		W area of 1311 5th	acous ti	ical ceiling	tiles				
23 -1AB		W area of 1311 5th E area of 1321 5th	ight Brow A=	in sheet vin	141	1			
23-2AB		+	B- Yell	ow mastic]
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Attachment IX.5 3/2008 Patriot QA Manual Page & of

PATRIOT ENVIRONMENTAL LABORATORY SERVICES, INC.

PATRIOT

CHAIN OF CUSTODY

Lab Use Only
Report Number

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Client: SCS	Enc	gineers		ject# 0/2						
l.	_	aford Hotel	Loc	ation: 130	1_5	5th Ave.				
Sample ID	LAB	Location	Descrip	otion	Start	Stop	Flow Rate	Total	Volume (L)	
	ID		(Sample type, dime		Time	Time	(LPM)	Min.	(Flow x Tot. Min)	
24-1		W area 1321 5th	While alop	-in 2X4						
24.2	4.4	Middle area 1321 5th	acoustical a	ceiling						
24-3		112 311 64 75 67 8	tiles							
25-1AB		Middle area 13335 ^t	Tan 12 x Composit	12 vinyl Hon tiles						
25.2AB		L	B= Yellou							
26-1 AB		w area 1333 5th A=		E .	1yl		_			
26.2AB		L	Comp. File B=Yellow							
27-1 AB		Middle area 1333 5 th								
27.2 AB		<u></u>	B= Yellow							
28-141		NW ceiling 1333 5th	acoustical	drop-in Ceiling						
28-2		N ciling 1333 5th	tiles							
29-1AB	The second of	N area RR 1333 5th								
29-2AB		NW area RR 1333 5th	B= Yellow	mastic						
29-3 AB	1000	NE area RK 1333 5 H	ı L	•						
30-1 AB		N area 1315 5 ^{4<u>h</u>}	A= Light bl	np. tiles	2''	1				
30-2 AB		NE area 1315 5 th	B= Yellow	mastic /					1	
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PATRIOT ENVIRONMENTAL LABORATORY SERVICES, INC.

CHAIN OF CUSTODY

Lab Use Only

CATORATORY SERVICES		www.patriotlab.com			Report Number:					
Client: SCS	Enc	gineers		Project # 012	01209275.00					
Project Name:	Project Name: Sandford Hotel				Location: 1301 5th Ave.					
Sample ID	LAB !D	Location	Des	scription dimensions, etc)	Start Time	Stop Time	Flow Rate	Total Min.	Volume (L) (Flow x Tot. Min)	
30-3 AB		NW area 1315 5th	1	-						
31-1 BB		SW storage room 1315 5th	4: Black	12×12"VC1	-					
31-2 AB		1	B= Yellou	v mastic						
31-3 AB			_	_						
32-1 AB		SW storage room 13155 ^t	'A= While	12×12" UCI	-					
32-2 DB			B= Yellow	' mastic						
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7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841 Patriot Environmental Laboratory Ser

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123

Report Number: 372290 Project Number: 01209275.00 Project Name: Sandford Hotel Project Location: 1301-1333 5th Ave.

Date Collected: 2/23/2010 Date Received: 2/24/2010 Date Analyzed: 2/24/2010 Date Reported: 2/24/2010

Collected By: Claim Number: PO Number: Number of Samples: 8

Lab/Client ID	Location	Material Description	Result (mg/kg)
372290-001 L-1	Window Frame 4th Floor On Wood	Gray Paint Chips	80590
372290-002 L-2	E Wall 4th Floor On Stucco	White Paint Chips	None Detected
372290-003 L-3	E Wall 4th Floor On Stucco	Gray Paint Chips	174
372290-004 L-4	S Wall 1st Floor On Stucco	Gray Paint Chips	643
372290-005 L-5	S Wall 1st Floor On Stucco	White Paint Chips	23200
372290-006 L-6	Door Frame S Wall 1st Floor On Wood	Dark Gray Paint Chips	1110
372290-007 L-7	Ceilings Eave 1st Floor W Area On Concrete	White Paint Chips	None Detected
372290-008 L-8	W Area 1st Floor On Wood	White Paint Chips	1770

Reporting Limit: 0.005% or 50 mg/kg.

Layered paints are analyzed as composite to minimize risk of cross-contamination.

Duil Espique

David Espique - Analyst

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Tel: 714.899.8900 Free: 888.743.0998 Fax: 714.899.7098



SD Housing Commission

http://www.patriotlab.com
7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841 Patriot Environmental Laboratory

SCS Engineers Report Number: 372288
Attn: Ryan Marcos Project Number: 01209275.00

8799 Balboa Ave. #290 San Diego, CA 92123

Project Name:

Project Location: Sandford Hotel
1301-1333 5th Ave.

Date Collected: 2/23/2010 Collected By:

Date Received: 2/24/2010 Claim Number:

Date Analyzed: 2/24/2010 PO Number:

Date Reported: 2/24/2010 Number of Samples: 3

Lab/Client ID/Layer	Location	Material Description	Color	Composition (%)
372288-001 1-1	E Window 4th Floor	Window Putty	White	95% Carbonate 5% Paint
Total Asbestos	None Detected			
372288-002 1-2	N Window 4th Floor	Window Putty	White	95% Carbonate 5% Paint
Total Asbestos	None Detected			
372288-003 1-3	W Window 4th Floor	Window Putty	White	95% Carbonate 5% Paint

Bulk sample(s) submitted was (were) analyzed in accordance with the procedure outlined in the US Federal Register 40 CFR 763, Subpart F, Appendix A; EPA-600/R-93/116 (Method for Determination of Asbestos in Building Materials), and EPA-600/M4-82-020 (US EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples). Samples were analyzed using Calibrated Visual Estimations (CVES); therefore, results may not be reliable for samples of low asbestos concentration levels. Samples of wall systems containing discrete and separable layers are analyzed separately and reported as composite unless specifically requested by the customer to report analytical results for individual layers. This report applies only to the items tested. Results are representative of the samples submitted and may not represent the entire material from which the samples were collected. "None Detected" means that no asbestos was observed in the sample. "<1%" (less than one percent) means that asbestos was observed in the sample but the concentration is below the quantifiable level of 1%.

Rosa Mendoza - Analyst

None Detected

Total Asbestos

Cristina E. Tabatt - Approved By

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PATRIOT ENVIRONMENTAL LABORATORY SERVICES, INC.

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Client: SCS E	hai			Project #: 0/	2092	75,00			
		Balboa Ave. 1	#290	Project Name:				ision /	Sandford
			2/2 <i>3</i>	Location: /					Hotel
Client Contact: (Sample Collec					
Contact Phone:				Preservative:	NA				
		401-2350		Authorized By	: RM				· · · · · · · · · · · · · · · · · · ·
	858,	571-5357		PO#:	, · · · · · · · · · · · · · · · · · · ·		Claim #:		
Special Instructions	s:								
Analysis Rec	11169	sted		Turnaround	Time				
, interpolation	1400	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Rush (Same Day		<u>v</u>	Other		
<u>Asbestos</u>				24HR			(specify):		
PCM (fiber count)	N	IOSH 7400A		48HR]		
PLM (bulk asbestos)		PA 600/R-93/116		72HR		\Box	<u> </u>		
		ARB 435							
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Lead <i>by Flame AA</i>		Paint, Air Cassette, Dus	t Wina Wasta					I NIOGH .	7092mod
Lead Waste Profil		As necessary for dispo		* Note: Please					
Mold	Air (2: STLC/CAL WET Title 3: TCLP EPA 1311 Cassette	Culture a	and Identification					····
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Sample ID	LAB	Location		Pescription	Start	Stop	Flow Rate	Total	Volume (L)
	ID			e, dimensions, etc)	Time	Time	(LPM)	Min.	(Flow x Tot, Min
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1-2		E Window 4 th fl N Window 4 th fl	or puty	<i>'</i>					,
1.3		W window 4th	floor	L					
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7271 Garden Grove Blvd., Suite A Garden Grove, CA 92841 Patriot Environmental Laboratory Ser

SCS Engineers Attn: Ryan Marcos 8799 Balboa Ave. #290 San Diego, CA 92123

Report Number: 372290 Project Number: 01209275.00 Project Name: Sandford Hotel Project Location: 1301-1333 5th Ave.

Date Collected: 2/23/2010 Date Received: 2/24/2010 Date Analyzed: 2/24/2010 Date Reported: 2/24/2010

Collected By: Claim Number: PO Number: Number of Samples: 8

Lab/Client ID	Location	Material Description	Result (mg/kg)
372290-001 L-1	Window Frame 4th Floor On Wood	Gray Paint Chips	80590
372290-002 L-2	E Wall 4th Floor On Stucco	White Paint Chips	None Detected
372290-003 L-3	E Wall 4th Floor On Stucco	Gray Paint Chips	174
372290-004 L-4	S Wall 1st Floor On Stucco	Gray Paint Chips	643
372290-005 L-5	S Wall 1st Floor On Stucco	White Paint Chips	23200
372290-006 L-6	Door Frame S Wall 1st Floor On Wood	Dark Gray Paint Chips	1110
372290-007 L-7	Ceilings Eave 1st Floor W Area On Concrete	White Paint Chips	None Detected
372290-008 L-8	W Area 1st Floor On Wood	White Paint Chips	1770

Reporting Limit: 0.005% or 50 mg/kg.

Layered paints are analyzed as composite to minimize risk of cross-contamination.

Duil Espique

David Espique - Analyst

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SCS ENGINEERS















Technical Specifications for Removal of Asbestos-Containing Materials and Lead Paint

Assessor's Parcel Number
533-453-03
1301 to 1333 Fifth Avenue and
518 A Street
San Diego, California

Presented to:

SAN DIEGO HOUSING COMISSION

1122 Broadway, 5th Floor San Diego, California 92101 (619) 578-7587

Presented by:

SCS ENGINEERS

8799 Balboa Avenue, Suite 290 San Diego, California 92123 (858) 571-5500

May 14, 2010 Project Number: 01209275.00

Offices Nationwide www.scsengineers.com

May 14, 2010

Project Number: 01209275.00

Mr. Roger Green Real Estate Manager San Diego Housing Commission 1122 Broadway, 5th Floor San Diego, California 92101

Subject:

Technical Specifications for Removal of Asbestos-Containing Materials and

Lead Paint (Specifications)

Site:

Assessor's Parcel Number (APN) 533-453-03 1301 to 1333 Fifth Avenue and 518 A Street

San Diego, California

Dear Mr. Green:

SCS Engineers (SCS) is pleased to present these Specifications in connection with the removal of asbestos-containing materials and lead paint. These Specifications were prepared in general accordance with the executed San Diego Housing Commission Agreement for Services, Materials, Supplies or Consulting (Contract) between the San Diego Housing Commission (Client) and SCS. The Contract was fully executed on January 20, 2010.

Should you have any questions regarding this Report, please do not hesitate to call the undersigned at (858) 571-5500.

Sincerely

Cristobal A. Ramirez

AHERA Building Inspector #BI-14883

Staff Professional

SCS ENGINEERS

Ryan T. Marcos

Ulu III

Certified Asbestos Consultant #90-2759 National Partner for Due Diligence

SCS ENGINEERS

Drew Cornelison

DHS Lead Inspector/Risk Assessor #I-16821

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Enclosures

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Appendices

Hazardous Materials Survey Report

1.0 BACKGROUND

SCS understands that the Site is currently developed with a four-story (130-room) hotel building, which was reported to have been constructed circa 1914 (and renovated circa 1989). The Site building is reported to encompass approximately 63,682 square feet. The building is reportedly constructed over a basement, which encompasses 18,275 square feet. SCS understands that the Client is proposing to purchase the Site and renovate the building. Proposed renovation plans for the building are limited to the installation of new flooring materials, the installation of new restroom fixtures, the painting of interior and exterior walls and ceilings, window upgrades, partial structural improvements, and the installation of a new roof.

SCS completed a report for the Site entitled, Asbestos and Lead Paint Survey, Assessor's Parcel Number (APN) 533-453-03, 1301 to 1333 Fifth Avenue and 518 A Street, San Diego, California, which was dated February 25, 2010. The following sections (Sections 2, 3, 4, and 5) summarize the findings of the above-referenced Survey.

2.0 ASBESTOS-CONTAINING MATERIALS

The following table summarizes the results of the above-referenced Survey in connection with asbestos-containing materials (ACMs). Please note that SCS provided ACM quantities in the following tables. Any quantities listed in the table below are illustrative only and not intended to represent actual quantities for abatement project bidding purposes. It is the responsibility of the abatement contractor (Contractor) to measure ACM quantities and determine the level of effort required to properly remove all identified ACMs from Site building. The Contractor must visit the Site and observe and quantify ACMs in all abatement areas. No claim for additional cost (e.g., change orders) will be accepted by the Client based on incorrect quantity estimates.

Material	Sample Location	F/NF	Cond.	Qty. ¹ (SF)	Asbestos Analytical Results ²
White window putty	Roof room	F	Poor	6 windows	3% Chrysotile
Black roof mastic	Roof	NF	Good	50 SF	10% Chrysotile
Brown 9" x 9" vinyl composition tiles	Mezzanine of 1311 Fifth Avenue	NF	Poor	250 SF	6% Chrysotile

Notes:

F/NF: Friable/non-friable

Total estimated quantity observed. Not to be relied upon for abatement bidding purposes. 1:

2: Asbestos content as determined by polarized light microscopy (PLM) with dispersion staining as

recommended by the Environmental Protection Agency (EPA).

SF: Square feet

The following recommendations were based on SCS's experience, laboratory results, and the assumption that the Site building will be renovated:

- Prior to being disturbed as a result of demolition activities, ACMs identified at the Site building proposed to be renovated must be removed by a properly licensed abatement contractor. ACMs must be disposed of at an approved landfill.
- Asbestos abatement should be monitored by an independent third party. Third party
 monitoring is conducted to ensure documentation of the abatement activities and to
 limit the building owner's liabilities. Monitoring should include development of
 project specifications, visual inspections during and after the project, and air
 monitoring prior to, during, and at project completion to verify that the area is safe for
 re-occupancy. Air monitoring will determine if the air/fiber concentration levels are
 within acceptable levels.

3.0 LEAD PAINT

The following table represents paint with lead concentrations exceeding 600 milligrams per kilogram (mg/kg) at the Site building. Please note that, although some of these paint systems were listed in the Survey as in good condition, they were observed to be in poor condition (i.e., loose and flaking, not adhered to substrate) in other homogeneous areas, therefore, these paint systems were sampled and analyzed based on the fact that they may require abatement prior to renovation activities.

Material Description/ Material Location	Color	Lead Content (mg/kg)			
1475 Somerset Avenue					
Paint on metal/East wall of building at roof area	White	1,250			
Paint on stucco/East wall of building of roof area	White	7,870			
Paint on wood/East window in roof room	White	33,700			
Paint on wood/West exterior window frame of 4th floor	Gray	80,590			
Paint on stucco/South wall of building of 1st floor	Gray	643			
Paint on stucco/South wall of building of 1st floor	White	23,200			
Paint on wood/Door frame of south wall 1st floor	Dark gray	1,110			
Paint on wood/ Window frame of west wall 1st floor	White	1,770			

Please note that the listing above summarizes lead paint in poor (i.e., loose and flaking, not adhered to substrate) condition. There may be additional lead paints in fair or intact condition at the Site.

The above-referenced Survey report provided the following conclusions and recommendations in connection with lead paint:

Based on the results of this Survey, lead-based paint (LBP), as defined by Housing and
Urban Development (HUD) (greater than or equal to 5,000 mg/kg) was detected in four
painted systems sampled at the Site. There are four painted surfaces with less than 5,000
mg/kg reported, but greater than or equal to 600 mg/kg of lead content. California
Occupational Health and Safety Act (Cal-OSHA) guidelines indicate that coatings or

materials containing lead at concentrations equal to or exceeding 0.06 percent by weight or 600 mg/kg may constitute a health hazard for employees engaged in lead-related construction work. Please note that only paint systems that were observed to be in poor condition (i.e., loose and flaking, not adhered to substrate) were sampled. There may be additional LBP systems at the Site that were not sampled as part of this Survey.

- Based on our review and interpretation of relevant Cal-OSHA guidelines, coating or
 materials containing lead at concentrations equal to or exceeding 0.06 percent by weight or
 600 ppm are to be considered a potential health hazard for employees engaged in leadrelated construction work. Therefore, we recommend that the painted surfaces in poor
 condition (i.e., loose and flaking, not adhered to substrate) with lead content greater to or
 equal to 600 ppm be removed prior to renovation.
- If any lead is present in Site building painted systems, regardless of its concentration, the building renovation contractor must comply with OSHA regulations (Title 8, Section 1532.1) related to the demolition or salvage of structures where lead or materials containing lead are present.

4.0 ASSUMPTIONS

The following assumptions were used:

- Proposed renovation plans for the Site building are limited to the installation of new flooring materials, the installation of new restroom fixtures, the painting of interior and exterior walls and ceilings, window upgrades, partial structural improvements, and the installation of a new roof. With respect to suspect asbestos-containing materials, with the possible exception of the roof and window putty, the exterior of the Site building will not be affected by proposed renovations. Therefore, with the exception of the roof and window putty, no samples of exterior materials were sampled.
- SCS has assumed that only surfaces that contain lead paint in poor condition (i.e., loose and flaking, not adhered to the substrate) require abatement. Therefore, SCS only sampled paint in poor condition. Painted surfaces in good condition, which may or may not contain lead, will not be disturbed (i.e., just painted over).

5.0 ACCESS LIMITATIONS

Please note that only readily accessible suspect ACMs were sampled as part of this Survey (i.e., destructive or intrusive sampling techniques were minimized). The following examples of access limitations are provided below; however, please note that this is not a complete list:

 Bulk samples of flooring material were collected until the substrate was reached (e.g., wood, concrete, ceramic tiles, etc.). SCS did not conduct visual or sampling activities beneath this substrate. • Sample locations were limited (i.e., 3, 5, or 7 samples were collected for each homogeneous material). Therefore, if suspect material or material layering is present in areas were samples were not collected, they may have gone uncharacterized.

Please note that additional ACMs may be present within wall or attic spaces, plenums, mechanical systems, etc., that were not accessible during this Survey. Immediately prior to and/or during renovation activities, any suspect non-characterized building material should be sampled and analyzed for asbestos content.

6.0 ASBESTOS ABATEMENT

6.1 NOTIFICATIONS AND PERMITS

The abatement contractor (Contractor) is responsible for securing all necessary permits and notifying all appropriate regulatory agencies in writing prior to commencement of abatement activities at the Site within the period prescribed by applicable laws or regulations. The cost of regulatory interaction and securing all necessary permits is to be included in the bid submittal. Notifications must contain all information required by various regulatory agencies, including but not limited to the following:

- Name and address of Contractor.
- Scheduled starting and completion dates for asbestos abatement activities.
- Procedures that will be employed to comply with the regulations.
- Name and address of the waste disposal facility where the asbestos waste will be transported.
- Drawings of the Site, decontamination stations, routes of escape, fire extinguishers, etc.

Appropriate regulatory agencies may include, but are not limited to:

- United States Environmental Protection Agency (USEPA).
- California Department of Industrial Relations, California Occupational Safety and Health Administration (Cal-OSHA).
- California Environmental Protection Agency (Cal–EPA).
- Department of Toxic Substances Control (DTSC).
- San Diego County Air Pollution Control District (APCD).
- City of San Diego Fire Department.

6.2 PRE-JOB SUBMITTALS

The following information must be submitted by the Contractor at least five days prior to the start of abatement activities:

- Proof of registration for asbestos-related work with Cal-OSHA.
- Proof of Contractor's license and asbestos certification from the Contractor Licensing Board.

- Copies of written notifications to the APCD and Cal-OSHA.
- List of designated authorized personnel to be involved with abatement activities, including competent person(s).
- Proof of required employee training certifications, medical examination and certification, and respirator fit-test certifications.
- Proof of required insurance.
- Proof that all required permits have been obtained.
- A written standard operating procedure concerning the selection, fit testing, and use of respiratory protection.
- Proof that all authorized personnel are participating in a medical surveillance program.
- Copies of material safety data sheets (MSDS) for any chemicals to be used on the abatement project.
- Copies of emergency plans (including fire evacuation), security plans (including means for preventing accidental or unauthorized entry), and contingency plans (including relevant telephone numbers and addressing emergencies, equipment failures, and barrier failures).
- Copies of the project schedules, including critical dates (i.e., start of mobilization, commencement of asbestos removal operations, and completion of demobilization).
- A detailed job-specific plan of work procedures to be used in the abatement process including: sketches showing location, size, and details of asbestos control areas, location and details of change rooms, location of waste container pass-out airlock system, and locations of local exhaust equipment, a disposal plan, types of wetting agent; respirators, protective equipment, and pressure differential monitoring devices, and a detailed description of the method to be employed to control pollution.
- Documentation that waste haulers and disposal facilities (i.e., landfills) to be used have obtained any necessary federal, state, and local permits and are willing to accept the types of asbestos-containing waste that will be generated during the project.

6.3 REGULATIONS

Contractor must comply with the latest requirements and regulations governing asbestos removal and disposal. These regulations include, but are not limited to:

- Applicable USEPA regulations for asbestos (Code of Federal Regulations, Title 40, Part 763).
- Applicable U.S. National Emissions Standards for Hazardous Air Pollutants (Code of Federal Regulations, Title 40, Part 61).
- Applicable U.S. Department of Labor, Occupational Safety and Health Administration, Asbestos Regulations (Code of Federal Regulations, Title 29, Parts 1910.1001, 1910.134, and 1926.1101).
- Department of Transportation Regulations (49 CFR, Parts 172, 173, 178, and 179).
- Applicable California Code of Regulations (Titles 8 and 22).
- APCD Regulations.
- City of San Diego Fire Department Regulations.
- All other applicable federal, state, county, or local rules or regulations.

Whenever a conflict or overlap of a federal, state, county, or local rule or regulation occurs, the most stringent provision must apply.

The Contractor warrants that he is familiar with the codes and requirements applicable to asbestos abatement work and must give all notices and comply with all laws, ordinances, rules, and regulations applicable to the work. If the Contractor observes that the Specifications or plans are at variance therewith, he must give written notice to the Client describing such a variance. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, or regulations, the Contractor must bear all the costs that arise. The Contractor should pay particular attention to applicable Cal-OSHA regulations found in 8 CCR 1529 and the necessity of complying with these regulations during the project. Failure or omission on the part of the Contractor, or any of his representatives, either to discover or to bring to the attention of the Client any deviation from, omission from, or noncompliance with the requirements for asbestos abatement must not be used by the Contractor as defense for failure on his part to fulfill such requirements.

6.4 TRAINING AND MEDICAL REQUIREMENTS

Contractor personnel performing asbestos removal work, including personnel who may assess asbestos work areas for any other purposes, must be appropriately trained on at least the following within the previous 12 months:

- The aspects of asbestos abatement in accordance with the EPA Model Accreditation Plan (MAP) asbestos abatement workers training (40 CFR, Part 763, Subpart E, Appendix C) consisting of a 32-hour course that includes hands-on training.
- The appropriate use, maintenance, and limitations of respirators in accordance with Title 8, CCR 5144 (Respiratory Protection Standard), including appropriate respirator fit testing.
- All aspects of asbestos removal and handling required for the Contractor's designated competent person. Such training must be obtained in a comprehensive course for Contractor Supervisors that meets the criteria of the EPA MAP, and must consist of a 40-hour course that includes hands-on training.

The Contractor must provide medical examinations for all workers who may encounter an airborne fiber concentration of 0.1 fiber per cubic centimeter (f/cc) or greater for an 8-hour Time Weighted Average. In the absence of specific airborne fiber data, the Contractor must provide medical examinations for all workers who will enter the work area for any reason. Examination must as a minimum meet OSHA requirements as set forth in 29 CFR 1926.1101 and CCR Title 8, Section 1529.

6.5 RESPIRATORY PROTECTION

The Contractor must instruct and train each worker involved in asbestos abatement in proper use of respiratory equipment and require that each worker always wear a respirator, properly fitted on the face, in the work area from the start of any operation which may cause airborne asbestos fibers, until the work area is completely decontaminated and clearance has been granted. Use of

respiratory protection appropriate for the fiber-level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered, is required.

The following regulations and standards regarding respiratory protection must be followed:

- OSHA 29 CFR 1910.1001, 1910.134, and 1926.1101.
- Cal-OSHA CCR Title 8 1529.
- Compressed Gas Association, Inc. (CGA), Pamphlet G-7, "Compressed Air for Human Respiration," and Specification G-7.1, "Commodity Specification for Air."
- American National Standard Practices for Respiratory Protection (ANSI), ANSI Z88.2-1980 "Practices for Respiratory Protection."
- National Institute for Occupational Safety and Health (NIOSH).
- Mine Safety and Health Administration (MSHA).
- Other federal, state, and local regulations as required.

Where there is a conflict in requirements set forth in the above-listed regulations and standards, the Contractor must meet the more stringent requirement.

6.6 WORKER PROTECTION

The Contractor must do the following as related to worker protection:

- Set up, outside the decontamination facility, a board posting copies of all notifications, warning signs, licenses, and worker identifications for compliance with federal, state, and local laws and regulatory standards.
- Provide appropriate safety equipment to prevent slips, trips, and falls by abatement
 workers. Safety equipment may include lights, caution tape, signs, etc. All electrical
 equipment must be protected through the use of ground fault interrupt (GFI) circuitry.
 Contractor must follow all applicable regulations by federal and state OSHAs to provide
 a safe work place for all abatement workers.
- Maintain a copy of the Contractor's Injury and Illness Prevention Program as mandated by the California Labor Code, Section 10.6401.7 at the Site at all times.
- Provide workers with appropriate respiratory equipment suitable for asbestos exposure level in the work area according to OSHA Standard 29 CFR 1910.134, 1910.1001, and ANSI Standard Z88.2-1980. Where respirators with disposable filters are employed, sufficient replacement filters must be provided for the workers as necessary.
- Provide sufficient sets of disposable full body clothing for all abatement workers and authorized individuals. Such clothing must consist of full body coveralls, headgear, and eye protection as required by applicable safety regulations. At the completion of each day of abatement activity, all disposable items must be handled as asbestos-containing waste and properly disposed of. Contaminated, non-disposable clothing, footwear, and equipment must be properly contained, removed from the work area, and stored in an enclosed container at the completion of each work shift. At project completion all non-disposable items must be thoroughly cleaned and encapsulated.

Appropriately train all abatement workers to have sufficient instruction to perform the
tasks assigned to them. Contractor must ensure that medical examinations required under
asbestos regulations are current for all employees involved in the asbestos abatement
project. All personnel entering the work area must wear an approved respirator and
appropriate disposable coveralls, head cover, and footwear. Respirators must be fitted as
required by OSHA fit test protocols.

6.7 PRODUCTS

The following products must be supplied and used by the Contractor during abatement activities:

- Polyethylene sheeting in sizes to minimize the frequency of joints.
- Glass fiber or other tape capable of sealing joints of adjacent plastic sheets and the attachment of plastic sheeting to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions.
- Surfactants (wetting agents) that are non-toxic and non-irritant to skin and eye, and which are non-carcinogenic. Wetting agents must consist of 50% polyoxyethylene or polyglycol ester and 50% polyoxyethylene ether, or the equivalent. Wetting agents must be applied by means of an airless sprayer or equal.
- Encapsulant that conforms to USEPA requirements, and contains no toxic or hazardous substances and no solvents.
- Impermeable containers that are air- and water-tight and suitable to receive and retain ACMs until disposal at an approved site and properly labeled in accordance with applicable Cal-OSHA regulations (CCR Title 8 1529).
- Warning labels and signs that are in conformance with applicable Cal-OSHA regulations (CCR Title 8 1529).
- All other materials, such as lumber, nails, and hardware that may be required to construct
 and dismantle contaminated structures, decontamination area, and barrier that isolates the
 work area.

6.8 EQUIPMENT

The Contractor must provide and use the following equipment during the abatement project:

- Personally issued and marked respiratory equipment approved by NIOSH and meeting
 the specifications of Cal-OSHA for each worker. This respiratory equipment must be
 suitable for the asbestos exposure level in the work area according to CCR Title 8 1529
 (i). The Contractor must provide disposable high-efficient-particulate-air (HEPA)
 cartridges as required, with sufficient replacement cartridges.
- Sets of protective disposable clothing, head covers, gloves, eye protection, and foot covers of sizes to properly fit individual workers whenever they are required to enter the work area.
- A temporary unit with a separate equipment room, decontamination locker room, and clean locker room for personnel required to wear whole body clothing. The following must apply:

- Separate each room from the others and from the control area by airlocks. Provide two separate lockers for each asbestos worker, one in each locker room.
- Keep street clothing and street shoes in the clean locker. Vacuum and remove asbestos-contaminated disposable protective clothing while still wearing respirator in the equipment room. Seal clothing in impermeable bags or containers for disposal.
- Do not remove disposable protective clothing in the decontamination locker room.
- Remove work clothing in the decontamination locker room.
- Tag and bag work cloths for laundering and keep work shoes in decontamination locker room.
- Do not wear work clothing between work and home.
- Provide showers with hot and cold water.
- Locate showers between the decontamination locker room and clean locker room, and require workers to shower before changing into street clothes.
- Handle and dispose of shower wastewater as ACM or filtered it through a final filter of at least 0.5 micron particle collection capability before disposal into the sanitary sewer system.
- Handle and dispose of wastewater filters as ACM.
- Clean asbestos-contaminated work clothing in accordance with CCR Title 1529 or use disposable clothing.
- Physically attach the changing room to the work area whenever feasible and required.
- Goggles for personnel engaged in asbestos abatement when a full-face respirator is not being used.
- Asbestos warning signs (as outlined in CCR Title 8, 1529 [k] [7] [B]) printed in English and Spanish at entrances to work areas. Locate signs at such distance that a person may read the sign and take the necessary precautions before entering the work area. Affix labels to ACMs, scraps, waste, debris, sealed impermeable bags, asbestos waste drums, and other asbestos-containing receptacles. Caution signs and labels must be maintained at each of the following locations:
 - At each electrical panel.
 - At each corner of the work area.
 - Within 5 feet of the external entry to the shower room from the work area.
 - Within 5 feet of the external entry to the shower room from the clean room.

6.9 LOCAL EXHAUST SYSTEM

The Contractor must provide a local exhaust system in accordance with ANSI Z9.2 and as specified herein:

- A local exhaust system in each work area.
- Properly labeled HEPA and 586 filters on vacuums and exhaust equipment.

- Local exhaust equipment designed for a minimum of one work area air change every 15 minutes and additional air change flow rate sufficient to maintain a minimum pressure differential of minus 0.02 inches of water column relative to adjacent, unsealed areas. Local exhaust equipment must be operated 24 hours per day until the asbestos control area has been removed. The Contractor is responsible for providing all necessary manpower and/or equipment including but not limited to emergency power, security, and fire watch to ensure 24-hour operation.
- Additional local exhaust systems (ventilation units) in accordance with these Specifications for use inside containment in the event engineering controls are not effective in controlling the fiber count below the permissible exposure limit (PEL) during abatement activities. The unit(s) must be placed inside the containment as an additional filtration devise in a manner to move air away from the worker's breathing zones and towards the exhaust unit(s).
- At a minimum, one local exhaust system for every 10 units on the Site for back-up in case that a ventilation unit fails to operate properly. These backup units must be stored at the Site during the entire project duration.
- A manometer-type or magnehelic-type negative pressure differential monitor with minor scale divisions of 0.02 inches of water and accuracy within plus or minus one percent.

In addition, the Contractor must:

- Calibrate the manometer daily and as recommended by the manufacturer.
- Furnish recorded readings of the pressure differential between locations in the work area and adjacent uncontained areas.
- Take pressure differential readings at several points inside the work area including the furthest point from the local exhaust equipment.
- Replace filters as required to maintain system efficiency.
- Ensure that the building heating, ventilation, and air conditioning (HVAC) system are not used as the local exhaust system for any work area.

6.10 MONITORING (PERSONAL, AREA, CLEARANCE)

Personal exposure monitoring must be conducted as follows:

- Representative sampling on workers during abatement activities. This must be conducted in accordance with Title 8 CCR 1529 and 1926.1101.
- Full shift personnel monitoring (consisting of a minimum of two samples [one 4-hour sample in the morning and one 4-hour sample in the afternoon]) that is representative of each task performed. More cassettes should be used as deemed necessary to avoid overloading. Volume of personal samples must not exceed 480 liters.
- One excursion sample per work area. This includes one 30-minute sample, of the person selected by the Contractor, which is most likely exposed to the highest fiber concentrations. This sample must be taken at the time when the highest concentrations are anticipated.

- A minimum of 48 liters of air pulled through the filter and a maximum of 480 liters for personal exposure samples.
- Submission of at least 2 blank cassettes (or 10% of samples, whichever is greater). Blanks are to be opened at the beginning of the sampling period and stored in a clean area, then closed at the end of the sampling period and submitted with the day's samples for analysis.

Area monitoring will be conducted by SCS, to verify that the Site building beyond the work area and the outside environment remain uncontaminated, as follows:

- Area samples will be collected for phase contrast microscopy (PCM) analysis by NIOSH 7400 method.
- Air monitoring will be conducted inside the work area. If only half-face respirators are worn, airborne asbestos concentrations must be less than 0.1 feet per cubic centimeter (f/cc) inside the work area.
- Area samples will be collected outside the work area during abatement activities.
 Airborne asbestos concentrations of less than 0.01 f/cc must be maintained outside the work area.
- If air samples exceed the above-listed concentrations immediate corrective action must be taken by the Contractor to reduce airborne asbestos fiber concentrations to levels below the above-referenced concentrations

SCS will perform a visual inspection of the work area at the end of each day of abatement activity. At the end of each shift, all asbestos debris must be contained and disturbed ACMs encapsulated. In addition, the local exhaust system must be operated continuously from the beginning of the ACM removal until acceptable clearance air samples are obtained. Prior to clearance air monitoring, a visual inspection of the work areas must be made by SCS. If the visual inspection is not deemed acceptable by SCS, the Contractor must correct all deficiencies prior to clearance sampling. Upon completion of the visual inspection (to the satisfaction of SCS), the Contractor may encapsulate the area prior to the collection of clearance air samples. Clearance sampling must be conducted as follows:

- There will be a minimum of five (5) clearance air samples per friable abatement work area and a minimum of two (2) clearance air samples per non-friable abatement work area.
- Clearance samples will be collected for phase contrast microscopy (PCM) analysis by NIOSH 7400 method.
- In order for an abatement area to be considered "complete," all of the data recorded within the enclosure must be below the EPA recommended "clearance criteria" of 0.01 f/cc
- If a work area fails clearance sampling, the Contractor must re-clean the areas as deemed necessary, and additional clearance samples must be collected and analyzed. This process must be repeated until passing results are achieved.
- If the PCM analysis is found to be greater than 0.01 f/cc, the air samples will be analyzed using transmission electron microscopy (TEM) methods.

6.11 GENERAL REQUIREMENTS

The Contractor must use the following engineering controls and work practices in any abatement activities at the Site, regardless of the level of exposure:

- Vacuum cleaners equipped with HEPA filters to collect all debris and dust containing ACM.
- Wet methods, or wetting agents, to control employee exposure during asbestos abatement activities, except where Contractor demonstrates that the use of wet methods is infeasible (i.e., electrical hazards, equipment malfunction, sloped roofs, etc.).
- Prompt cleanup and disposal of waste and debris contaminated with asbestos in leak-tight containers.

The following work practices and engineering controls must not be used during abatement activities:

- High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
- Compressed air used to remove materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
- Dry sweeping, shoveling, or other dry cleanup of dust and debris containing ACMs.
- Employee rotation as a means of reducing employee exposure to asbestos.

6.12 WORK AREA PREPARATION

CLASS II - ROOF MASTIC

Prior to the start of the removal of ACMs, the Contractor must prepare the work area as follows:

- Post danger signs and limit access to the work area. The work area must be cordoned off to prevent the entry of unauthorized persons. Danger signs must be posted at all areas of access to the regulated area. The signs must be in a language(s) understood by the majority of the local population.
- Shut down roof-level heating and ventilation air intake sources and covered and seal intakes by, at a minimum, two layers of 6-mil polyethylene sheeting.

In addition, the following work practices must be followed in connection with roof mastic abatement:

- Roof mastic must be removed manually in such a way that the materials are not rendered friable (e.g., no power roof cutter, saws, etc.).
- Roof mastic must be removed in an intact state to the extent feasible.
- Wet methods must be used to remove roof mastic that is not intact, or that will be rendered not intact during removal, unless such wet methods will create safety hazards.

- ACMs that are removed must be contained, on the roof, in two (e.g., double bagged) 6-mil polyethylene bags.
- ACMs that have been removed from a roof must not be dropped or thrown to the ground.
 Unless the material is carried or passed to the ground by hand, it must be lowered to the ground via covered, dust-tight chute, crane, or hoist.
- Any ACM that is not intact must be lowered to the ground as soon as is practicable, but in any event, not later than the end of the work shift. While the material remains on the roof it must either be kept wet and placed in 6-mil polyethylene bags.
- Upon being lowered, ACMs within two (e.g., double bagged) 6-mil polyethylene bags must be transferred to a closed receptacle in such a manner so as to preclude the dispersion of dust.

CLASS II - FLOOR TILES

Prior to the start of the removal of ACMs, the Contractor must prepare the work area as follows:

- Provide warning signs meeting regulatory requirements at each visual and physical barrier. Asbestos work areas must be appropriately delineated and labeled to warn persons outside the work area of potential hazards and restrict their movement into the work area.
- Completely isolate the work areas from other parts of the building so as to prevent asbestos-containing dust or debris from passing beyond the isolated area.
- Seal all openings with a 6-mil minimum polyethylene containment barrier to prevent leakage of air into the outside environment or other portions of the building. Individually seal ventilation openings on walls (supply and exhaust), wall-mounted fixtures, doorways, windows, and other wall and floor openings into the work area with adhesive tape along with two layers of 6-mil polyethylene sheeting taped securely with adhesive tape.
- Disable ventilation systems or any other system bringing air into or out of the work area. Disable system by disconnecting wires, removing circuit breakers, by lockable switch or other positive means that will prevent accidental premature starting of equipment.
- Lock out/tag out power to the work area.
- Pre-clean movable objects to be salvaged within the proposed work areas using HEPA
 vacuum equipment or wet cleaning methods as appropriate. The Contractor must move
 such items to storage or another area as directed by the Client.
- Pre-clean immovable objects, such as mechanical and electrical equipment and fixtures, within the proposed work area using HEPA vacuum equipment or wet cleaning methods as appropriate.
- Cover all walls with 4-mil polyethylene splash guards to a height that will limit the potential for contamination of wall material.
- Not use cleaning methods that raise dust such as broom sweeping or vacuuming with non-HEPA-equipped vacuum cleaners.
- Construct worker and waste container/equipment decontamination units in compliance with EPA guidelines. Provide sufficient numbers of lockers in change or "clean" rooms for worker's clothing.

- Establish emergency exits and procedures for the work area, satisfactory to fire officials, and provide fire extinguishers as required.
- Ensure that barriers and plastic enclosures remain effectively sealed and taped. Inadvertent tears in plastic must be repaired with fiber tape and the tear covered by plastic applied with spray adhesive, overlapping the tear by 6 inches on all sides.
- Provide HEPA-filter-equipped local exhaust equipment designed for a minimum of one work area air change every 15 minutes. Local exhaust equipment must be operated 24 hours per day until the asbestos control area has been removed.

If during abatement activities ACM is observed outside of abatement enclosures, or if damage occurs to the enclosure barrier(s), work must stop immediately upon discovery, appropriate repairs will be made (by Contractor), and all such debris will be collected using appropriate vacuums and wet methods.

CLASS II - WINDOW PUTTY

Prior to the start of the removal of ACMs, the following engineering controls must be in place:

- Contractor must establish a regulated area utilizing asbestos caution tape, signs, and tenting as required by Cal-OSHA and NESHAP regulations.
- A 6-mil polyethylene drop cloth must be place beneath the work area.
- Contractor shall conduct all removal activities using wet methods.
- Material must be sprayed with amended water prior to removal, and kept wet during the removal process.
- Material shall be removed in an intact state to the extent feasible.
- Contractor shall utilize HEPA-filter-equipped vacuum cleaners and all loose dust left from the operations must be vacuumed immediately.
- The removed materials must be bagged prior to disposal in 6-mil polyethylene bags.

6.13 PERSONNEL DECONTAMINATION UNIT

Class II areas

Contractor must provide personnel decontamination unit consisting of an arrangement of two connected rooms or spaces (clean room and equipment room). Contractor must require all personnel without exception to pass through the decontamination unit for entry into and exiting the work area for any purpose. The Contractor must not allow parallel routes for entry or exit. The Contractor must not remove equipment or materials through the personnel decontamination unit. The Contractor must provide adequate temporary lighting in the personnel decontamination unit. The personnel decontamination unit must include the following:

Clean room (changing room)

Room must be physically and visually separated from the work area for the purpose of changing into protective clothing, which requires the following:

- Construct using polyethylene sheeting, at least 6-mil in thickness, to provide an airtight seal between the clean room and other decontamination units.
- Locate so that access to the work areas from the clean room is through the equipment room.
- Separate cleaning room from the building by a sheet-plastic-flapped doorway.
- Require workers to remove all street clothes in this room, dress in protective coveralls, and put on respiratory protection equipment. Do not allow asbestos-contaminated items to enter this room. Require workers to enter this room either from outside the structure dressed in street clothes, or naked from the equipment.
- Maintain floor of changing room dry and clean at all times.
- Damp wipe all surfaces twice after each shift change with disinfectant solution.
- Provide posted information for all emergency phone numbers and procedures.
- Provide a continuously adequate supply of disposable bath towels.
- Provide one storage locker per employee.
- Provide an airlock between the clean room and the equipment room. Separate the airlock from the clean and equipment rooms with airtight walls fabricated of 6-mill polyethylene sheeting and plastic sheeting flapped doorways.

Equipment room (contaminated area)

Workers must have equipment, footwear, and additional contaminated work clothing in the equipment room. This is a change and transit area for workers, which requires the following:

- Separate this room from the work area by a 6-mil polyethylene flapped doorway.
- Separate this room from the rest of the Site building with airtight walls fabricated of 6-mil polyethylene.
- Separate this room from the clean room and work area with airtight walls fabricated of 6-mil polyethylene.
- Damp wipe clean all surfaces after each shift change.
- Provide a container for collection of used protective clothing.

Contractor must require that all workers adhere to the following sequence when entering or leaving the work area:

- The worker enters the clean room and removes street clothing, puts on protective coveralls and respirator, and move to the equipment room.
- Any additional clothing and equipment left in the equipment room needed by the worker are put on in the equipment room.
- Worker proceeds to the work area.
- Before leaving the work area, the worker removes all gross contamination and debris from coveralls and feet.
- The worker then proceeds to the equipment room and removes all clothing except respiratory protection equipment.
- Extra work clothing such as boots, hard hats, goggles, and gloves are to be stored in the contaminated end of the equipment room.
- Disposable coveralls are placed in a bag for disposal with other material.

The worker moves to the clean room and dresses in either new coveralls for another entry or street clothes if leaving.

6.14 EQUIPMENT DECONTAMINATION UNIT

Contractor must provide an equipment decontamination unit consisting of an arrangement of rooms (clean room, holding room, and wash room) for removal of equipment and materials from the work area. Contractor must not allow personnel to enter or exit the work area through the equipment decontamination unit.

Wash room

Contractor must provide a wash room for cleaning of bagged or containerized asbestoscontaining waste materials passed from the work area.

- Construct wash room of wood or PVC framing of appropriate-size materials and polyethylene sheeting, at least 6-mil in thickness and located so that packaged materials, after being wiped clean, can be passed through the holding room.
- Separate this room from the work area by a single-flap door of 6-mil polyethylene sheeting.
- Provide a drop-cloth layer of plastic on the floor in the wash room for every load-out operation. Roll this drop-cloth layer of plastic from the wash room into the work area after each load out. Provide a minimum of two layers of plastic at all times. Use only clear plastic to cover floors.

Holding room

Contractor must provide a holding room as a drop location for bagged ACMs passed from the wash room.

- Construct wash room of wood or PVC framing of appropriate-size materials and polyethylene sheeting, at least 6-mil in thickness.
- Separate this room from the adjacent rooms by single-flap doors of 6-mil polyethylene sheeting.

Clean Room

Contractor must provide a clean room to isolate the holding room from the area outside of the Site building. If possible, locate clean room to provide direct access to the holding room from the exterior.

- Construct wash room of wood or PVC framing of appropriate-size materials and polyethylene sheeting, at least 6-mill in thickness.
- Separate this room from the exterior by a single-flap door of 6-mil polyethylene sheeting.

Load-out area

The load-out area is the transfer area from the Site building to a truck or dumpster. It may be the clean room of the equipment decontamination unit or a separate room or loading dock area.

- During transfer of material from the load-out area, erect primary barriers as necessary to seal the path from load-out area to truck or dumpster.
- Provide a lockable door to secure the work area during non-work hours.

Decontamination sequence

Contractor must take all equipment or material from the work area through the decontamination unit according to the following procedure:

- Thoroughly wet-clean contaminated equipment or sealed polyethylene bags and pass into wash room.
- Once inside the wash room, wet-clean the bags and/or equipment.
- When cleaning is complete, pass items into the holding room.
- Workers from the building exterior enter holding room and remove decontaminated equipment and/or containers for disposal.
- Require those workers to wear full protective clothing and appropriate respiratory protection.
- At no time is a worker from an uncontaminated area to enter the enclosure when a removal worker is inside.

6.15 ASBESTOS REMOVAL

In the work area, the Contractor must:

- Remove and dispose of all ACMs in accordance with the methods and procedures outlined in CCR Title 8 1529.
- Where appropriate, enclose work areas under differential air pressure for the duration of the asbestos abatement and subsequent cleaning phases and until all removal areas have been air-tested and found to be in compliance with a specified clearance level.
- Perform appropriate cleaning using HEPA vacuum or wet-cleaning methods of areas physically connected to areas receiving asbestos removal.
- Dispose of all contaminated or otherwise removed materials and wastes in secure and labeled containers in an approved sanitary landfill.
- Never use high-pressure water streams to remove any type of ACMs.

Before and during removal, the contractor must:

- Thoroughly spray all ACMs with water containing an accepted wetting agent (i.e., amended water) to enhance penetration and an encapsulating fluid to minimize fiber release.
- Apply fine, low-pressure spray of amended water to minimize fiber release (especially during removal of friable materials). Generally, ACMs must be sufficiently moistened to minimize emissions of airborne fibers as much as practical during removal.

For removed ACMs the Contractor must:

- Place, while still moist the ACMs, into watertight polyethylene bags marked with the label prescribed by OSHA and department of transportation (DOT) regulations.
- Pack all plastic sheeting, tape, cleaning material, clothing, and all other disposable materials or items used in the work area, while moist, into sealable plastic lined containers (6-mil minimum).
- Clean exterior surfaces of all containers before leaving the work area.
- Place all waste containers directly into designated covered trucks or roll-off bins lined with 6-mil plastic sheeting. Contained waste must be transferred to the truck or roll-off bin in a manner that minimizes tearing, puncturing, or breaking the containers.

After removal, all surfaces must be wet-cleaned and HEPA vacuumed to remove residual accumulated material. After cleaning, surfaces must appear free of visual material.

A visual inspection of the work area must be made by SCS at the end of each day of abatement activity. At the end of each shift, all asbestos debris must be contained and disturbed ACMs encapsulated. In addition, the local exhaust system (negative air) must be operated continuously from the beginning of ACM removal until acceptable clearance air samples are obtained.

At abatement completion the Contractor must:

- Remove all polyethylene sheeting except for the critical barriers. This should be performed in a manner that will maintain the integrity of the negative pressure enclosure.
- After the polyethylene sheeting has been removed, except for the critical barriers, wipe down all walls and floors using wet methods.

The following procedures must apply:

- A negative pressure enclosure (NPE) system will be used for the removal during Class II jobs, with the possible exception of exterior work area (e.g., roof, transite, stucco, etc.).
- Before beginning work within the enclosure and at the beginning of each shift, the NPE
 must be inspected for breaches and smoke-tested for leaks. Any leaks detected must be
 sealed by the Contractor.
- Electrical circuits in the enclosure must be deactivated and locked out/tagged out.
 Temporary power and portable lighting sources must be provided from outside the work area to insure safe installation (including using ground fault circuit interrupter [GFCI]).
 Temporary power sources and equipment must comply with all applicable electrical code requirements and federal, state, and local requirements.
- ACMs must be thoroughly wetted prior to removal using a fine spray (mist) of amended water or removal encapsulant applied with airless spray equipment.
- The work area must be continuously misted with amended water whenever necessary to reduce airborne fiber levels. Apply mist with airless spray equipment.

6.16 GENERAL ASBESTOS ABATEMENT GUIDELINES

All containers, trucks, and roll-off bins with asbestos-containing wastes must be individually labeled according to DOT regulations (49 CFR Part 172) including waste type, generator

information (i.e., name and location), and disposal site destination. Storage of trucks or roll-off bins containing waste materials on-Site should be minimized. Moreover, waste materials are not to be temporarily stored off Site or taken to a transfer facility. Plastic sheet lining the inside of the truck or roll-off must be torn down at the disposal site and disposed of as asbestoscontaminated waste.

The Contractor will be responsible for any and all citations, cleanup, and/or monitoring costs associated with accidents, spills, or improper handling during collection, transport, and/or disposal of the wastes, including but not limited to re-cleaning associated with unacceptable clearance air sample results. Contractor will indemnify, defend, and hold harmless the Client, their officers, partners, employees, and assigns for and from all actions, lawsuits, or claims by government agencies and/or any loss sustained as a result of contamination of any area by Contractor negligence including but not limited to personal injury, lost profits, property damage, loss of property value, and attorney fees.

6.17 WASTE DISPOSAL

All ACMs are to be disposed of at a facility permitted to accept asbestos-containing wastes. The Contractor will be responsible for all costs associated with recovering, transporting, and disposing of any asbestos-containing waste materials not properly disposed of. All trucks and/or roll-off containers used for transporting asbestos-containing waste materials must proceed or be transported from the Site directly to the disposal facility. The Client has the right to reject unacceptable disposal facilities. Commingling of wastes (i.e., from other job sites or generators) is not allowed.

6.18 MANIFESTS

All ACMs must be removed from the Site buildings and disposed of under appropriate waste manifests (i.e., friable ACMs under a uniform hazardous waste manifest; non-friable ACMs under a non-hazardous waste manifest). Manifests are to be signed by the property owners or their representatives. The contractor must certify that all waste materials are properly classified, packaged, marked, and labeled, and are in all respects in proper condition for transport. Prior to transporting ACM wastes from the Site to the landfill, all waste manifests generated from this project must be submitted to the Client for review at the time wastes are collected by the transporter.

6.19 FINAL SUBMITTALS

At the conclusion of abatement activities, a letter of completion from the Contractor must be received by the Monitoring Firm within ten business days after final cleanup activities have been completed. The letter of completion must state, "All identified ACMs have been removed and disposed of in accordance with these specifications and all applicable federal, state, and local regulations, laws, and statutes."

In addition to the previously requested submittals, the Contractor must submit copies of the project log book, employee air monitoring results, notifications, and employee work records from this Site to SCS within ten business days after completion of abatement activities.

Note that no work will be accepted as "final" until all manifest receipts have been received by the Client from the disposal facility acknowledging proper disposal of all asbestos-containing wastes generated from this project.

7.0 LEAD ABATEMENT

7.1 REMOVAL

The Contractor must establish an initial exposure assessment (or use a previous negative exposure assessment) to determine the extent of the engineering controls and training that will be required for their personnel. Prior to establishing the initial exposure assessment, the Contractor must have the following items in place:

- Appropriate respiratory protection in accordance with CCR Title 8, 1532.1, Subsection (f).
- Appropriate personal protective clothing and equipment in accordance with CCR Title 8, 1532.1, Subsection (g).
- Change areas in accordance with CCR Title 8, 1532.1, Subsection (1) (2).
- Hand washing facilities in accordance with CCR Title 8, 1532.1, Subsection (1) (5).
- Biological monitoring consisting of blood sampling and analysis for lead and zinc protoporphyrin levels in accordance with CCR Title 8, 1532.1, Subsection (j) (1) (A).
- Training in accordance with CCR Title 8, 1532.1, Subsections (l) (1) (A) and (l) (2) (C). This training must be for lead awareness and to include hazard communication as outlined in Section 5194 and respirator usage as outlined in Section 1510.

Once this protocol has been established, the initial exposure assessment must be conducted by the Contractor during the first shift of work.

7.2 ENGINEERING CONTROLS

The engineering controls for the removal of paint systems in defective/damaged condition (i.e., loose, flaking, not adhered to the substrate) are as follows:

• Establish a regulated area using Occupational Safety and Health Administration (OSHA) lead danger tape and drop cloths.

- Equip all individuals performing the work with appropriate personal protective equipment (PPE), to included at a minimum, high efficiency particulate air filter (HEPA) equipped respirators, Tyvek (or equivalent) disposable suits, eye protection, and impermeable disposable gloves.
- Perform work under wet conditions (i.e., mist the paint prior to scraping or removing).
- Use HEPA filter equipped vacuum cleaners to decontaminate the area and workers.
- Establish hygiene facilities to, at a minimum, allow for employees to wash their hands and other exposed body parts at the completion of the work shift or whenever the employee leaves the regulated area. The hygiene facility must be contiguous with the regulated area.
- All paint chips and debris must be placed into lined Department of Transportation (DOT) acceptable drums for disposal.

Providing that the initial exposure assessment indicates that the exposure is below the Action Level (30 micrograms per cubic meter of air), these engineering controls are interpreted to be sufficient for the project. If the initial exposure assessment indicates the exposure to be above the Action Level or Permissible Exposure Limit (PEL) (50 micrograms per cubic meter of air), then training requirements will increase and engineering controls will become more stringent.

7.3 STABILIZATION AND DISPOSAL OF REMAINING PAINT AND PAINTED DEMOLITION DEBRIS

Once the paint systems in defective/damaged condition (i.e., loose, flaking, not adhered to the substrate) known to contain lead at concentrations greater than 600 mg/kg have been removed, the remaining paint should be stabilized prior to demolition. The Contractor may use paint or some other coating to stabilize prior to demolition.

Once the abatement is complete, the Contractor must accumulate all of the paint debris that has been generated during the abatement into DOT-approved drums for characterization and disposal as required.

The Contractor must perform waste characterization analysis on the lead paint waste through Waste Extraction Test (WET) and Toxicity Characteristic Leaching Procedure (TCLP) analysis. Depending on the WET and TCLP analysis the waste must be disposed of as a California or Federal waste.