



PROJECT DESIGN MANUAL

LANDMARK HEALTHCARE
FACILITIES, LLC

FORE RIVER MEDICAL COMPLEX
DAVID KELLER, M.D. – SUITE 470
175 FORE RIVER PARKWAY
PORTLAND, ME 04102

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PREPARED BY

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BIDDING AND CONTACT REQUIREMENTS

Section 00901 – Addendum No. 1

Date: *****, 2006

Landmark Healthcare Facilities LLC
839 North Jefferson Street
Milwaukee, WI 53202

To: Prospective Bidders

Subject: Addendum No. 1 to the bidding Documents for:

Hospital Name
Project Name
Project Location

This Addendum forms part of the Bidding Documents and modifies the original bidding documents dated *****. Acknowledge receipt of this Addendum in the space provided in the Bid Form. Failure to do so may subject the bidder to disqualification.

A. ADDENDUM TO THE PROJECT MANUAL:

1. Section 00000 – Typical Section
 - a. Page 00000-1, Section 1.02 Qualifications, subparagraph A.1.a: Delete ... and replace with the following:

“y”
 - b.
 - c.
2. Section 00000 – Typical Section
3. Section 00000 – Typical Section

B. ADDENDUM TO THE DRAWINGS:

1. Sheet C0.00
 - a. Detail 3 / C0.00:

b. N

c. n

2. Sheet A0.00

3. Sheet E0.00

END 00901.

DIVISION 1 – GENERAL REQUIREMENTS
Section 01100 – General Requirements

The General Conditions and Division 1 – General Requirements area hereby made a part of each division and section of the project specification.

PART 1 GENERAL

1.1 01100 GENERAL

- A. The site and premises shall be kept clean and free of accumulation of waste material and rubbish on a daily basis.
- B. Work shall be installed in accordance with manufacturer’s recommendations, specifications, and instructions.
- C. Materials shall be delivered to the site, undamaged in manufacturer’s clearly labeled unopened container, identified with brand, type, grade, and U.L. label where applicable.
- D. All sales, consumer use and any other taxes required by law shall be included.

1.2 01110 EXECUTION, CORRELATION, AND INTENT

- A. Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, has examined all conditions affecting the Work, and is familiar with all condition thereon.
- B. When conflicts exist within or between parts of the Contract Documents, or between the Contract Documents and applicable standards, codes and ordinances, the Contractor shall request, in writing, an interpretation from Landmark before proceeding with the Work. If the Contractor fails to make such a request prior to contract execution, the more stringent or higher quantity and higher quality requirements shall apply.
- C. Large scale drawings take precedence over small scaled drawings. Figured dimensions take precedent over scaled dimensions. Noted materials take precedent over graphic representation.
- D. The specifications are of the abbreviated type and include incomplete sentences. Omission of phrases such as “The Contractor shall,” or “conforming to the requirements of” is intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a “Note” occurs on the drawings. Words in singular shall include a plural whenever applicable, or the context so indicates.
- E. In the interest of brevity the Contract Documents frequently omit modifying words such as “all” and “any” and articles such as “the” and “an”, but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

- F. Organization of the Specifications into divisions, sections, and articles, and arrangement of Drawings shall not control the Contractor in establishing the extent of Work to be performed by any trade.
- G. If Work is required in a manner to make it impossible to produce Work of the quality required by the Contract, or should discrepancies appear among the Contract Documents, the Contractor shall request, in writing, an interpretation from Landmark before proceeding with the Work. If the Contractor fails to make such a request, no excuses will thereafter be entertained for failure to carry out Work in the required manner or provide required guaranties, warranties, or bonds.

1.3 01120 SUPERVISION AND CONSTRUCTION PROCEDURES

- A. The contractor shall supervise and direct the Work. The Contractor shall be solely responsible of and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.
- B. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents by activities or duties of the Architect or Landmark, in the administration of the Contract, including tests, inspections, or approvals required or performed by persons other than the Contractor.
- C. The Contractor shall coordinate all portions of the Work with the Owner and Landmark, and other separate Owner employed Contractors, in any.
- D. The Contractor shall take reasonable precautions for safety of people and property at the site. The Contractor shall provide reasonable protection to prevent damage or loss of Work including materials and equipment to be incorporated into the Work, whether in storage on or off the site, under care or control of the Contractor. The Contractor shall provide reasonable protection of other property at the site, or adjacent to the site such as trees, shrubs, lawns, walks, pavements, structures, and utilities not designated for removal, relocation or replacement in the course of the Work.
 - 1. The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent, unless otherwise designated by the Contractor in writing to Landmark.
 - 2. The Contractor, prior to commencing the Work, shall submit to Landmark, in writing, a statement certifying that he is familiar with the Manual of Accident Prevention in Construction by the Associated General Contractors of America, current edition, and that he will maintain at the Project a copy of said publication and will strictly enforce the applicable requirements of same. Contractor shall also state the name of the Contractor's Safety Engineer who will be responsible for enforcement of all safety requirements.

1.3 01140 CONTRACTOR'S USE OF SITE

- A. Construction shall be confined to improved and staging areas. Other portions of the site or hospital campus shall not be disturbed. If other areas are disturbed, they shall be repaired.

- B. Driveways and entrances serving both the site and the hospital facilities shall be kept clear and available to the hospital and hospital employees at all times. These areas shall not be used for parking or storage of materials. Deliveries shall be scheduled to minimize space and time requirements for storage of materials and equipment on site.
- C. Construction workers shall not be permitted to use hospital facilities.
- D. The hospital, site, and new construction area is a “No Smoking” facility. Smoking shall not be allowed at any time inside existing hospital buildings or within new construction once enclosed. Smoking shall be limited to hospital designated smoking areas outside of the buildings.
- E. Radios and similar entertainment devices shall not be allowed on site.
- F. Construction activity which may require temporary or periodic closure of existing facilities necessary to complete the Work shall be coordinated with Landmark.

1.3 01200 REFERENCE STANDARDS

- A. Reference Standards: When referenced in the preceding specifications, all work shall comply with the applicable portions of standards and specifications published by the technical societies, institutions, associations, and governing agencies referred to, latest revision in effect at the date of Contract Documents.

AAIEE	American Institute of Electrical and Electronics Engineers
AAN	American Association of Nurserymen
AAMA	Architectural Aluminum Manufacturers Association
ARI	Air Conditioning and Refrigeration Institute
ACI	American Concrete Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standards Council
ANSI	American National Standards Institute
APA	American Plywood Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASLC	American Society of Landscape Contractors
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWWA	American Water Works Association
AWI	Architectural Wood Institute
AWS	American Welding Society
AWWA	American Water Works Association
DOT	Department of Transportation Standard Specification for road and bridge construction, current edition.
FGMA	Flat Glass Marketing Association
FS	Federal Specification

GA	Gypsum Association
IMIAC	International Masonry Industry – All-Weather Council
LSGA	Laminated Safety Glass Association
ML/SFA	Metal Lath / Steel Framing Association
NEMA	National Electric Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SDI	Steel Deck Institute
SIGMA	Sealed Insulated Glass Manufacturers Association
SJI	Steel Joist Institute
SSPC	Steel Structures Painting Council
TCA	Tile Council of America
TPI	Truss Plate Institute
UL	Underwriter’s Laboratories
WIC	Woodwork Institute of California
WWPA	Western Wood Products Association

1.4 01300 DEFINITIONS AND STANDARDS

- A. *Addendum* (plural - Addenda) is a document issued after the original document issue date, but prior to the date of the execution date of the Contract, which modifies the original documents to the extent indicated.
- B. *All* requires the doing of all things except those listed items which are specifically excluded.
- C. *Codes* mean rules, regulations, or statutory requirements of government agencies.
- D. *Complete* means complete with all connections, supports, attachments, and incidental items necessary for a finished and properly operating assembly or installation.
- E. *Equal*, in reference to the acceptability of products, materials, and equipment, other than those specified shall be defined as meeting some of the most important of, but not necessarily all of, the characteristics of the product, material, and equipment specified.
 - a. It is understood that all of the characteristics of equality may not be applicable to each and every product and application required in the Work. Where a proposed product possesses some, but not all, of the equal characteristics, Landmark will make a judgment as to which of the characteristics are most important to the particular application and may waive those determined to be less important in a particular instance.
 - b. Landmark shall make the final judgment on if a product, material, or equipment is equal to those specified
 - c. The following is a list of characteristics used to determine if a product, material, and / or equipment is equal:
 - i. Being similar in material composition, manufacture, assembly, configuration, size and finish and possessing the same or better functional and performance characteristics.
 - ii. Having the same or better operating characteristics in terms of power requirements

- and output.
- iii. Having the same or greater term and force of Warranty/Guarantee.
 - iv. Having the same or greater choices of available colors and patterns.
 - v. Having the same or better availability and repair services.
 - vi. Having the same approvals of Code Officials and other governing authorities.
 - vii. Having the same or better compatibility with adjacent components and other related parts of the Work.
 - viii. Capable of providing the same design and artistic effect.
 - ix. Not requiring changes in details and construction of related work.
 - x. Having the same or lower installed cost.
- F. *Experienced* means having completed projects similar in size and scope to this Project.
- G. *Finished Floor Elevation* means the elevation of the top of the floor to which flooring finishes and materials are to be applied except that for terrazzo, mortar bed set ceramic and quarry tile, and other materials requiring a depressed slab, finished floor elevation means the top surface of the installed materials and the slab shall be depressed as required for the appropriate setting bed.
- H. *Furnish* means supply and deliver to the construction site, ready for unloading, unpacking, assembly, installation and similar operations.
- I. *Hospital* refers to the entity sponsoring the Project.
- J. *Indicated* refers to graphic representations, notes or schedules. Where terms such as “shown,” “noted,” “scheduled,” and “specified” are used, it is to help locate the reference.
- K. *Install* is used to describe operations including actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations.
- L. *Installer* is an entity engaged for performance of a particular construction activity, including installation, erection, application and similar operations. Installers shall be experienced in the operations they are engaged to perform.
- M. *Match* means providing a portion of the Work using the same construction products, techniques, sequences, dimensions, finishes, colors, and degree of craftsmanship as another portion of Work, or as existing conditions adjacent to the new portion of Work.
- N. *Necessary* shall be understood to refer to proper completion of the Work.
- O. *NIC* is used as an abbreviation for “Not included in the Contract”.
- P. *Opposite Hand* means a portion of the Work which matches another portion of Work but is a mirror image.
- Q. *Owner* refers to the entity owning the Project.
- R. *Project Site* is the space available for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project.

- S. *Provide* means to furnish and install, complete and ready for the intended use.
- T. *Regulations* include laws, statutes, ordinances and lawful orders issued by Authorities Having Jurisdiction.
- U. *Required* shall be understood to refer to the requirements of the Contract Documents, unless its use clearly implies a different interpretation.
- V. *Similar* means a portion of the Work which matches the whole or part of another portion of Work but has a slightly different configuration.
- W. *Standards* are requirements set by authorities, custom, or general consent and established as acceptable criteria.
- X. *Symmetrical* means a portion of the Work which matches adjacent Work, or itself, but reversed about centerlines of symmetry.
- Y. *Tenant* means an individual or firm executing a lease for space within the building.
- Z. *Testing laboratory* is an independent entity engaged to perform specific inspections or tests and to report on and interpret the results of those inspections or tests.
- AA. *Undeveloped Space* indicates space that will be developed in the future for tenant space. The shell and core undeveloped space shall be developed to the following standards:
 - a. Exterior wall shall be thermally insulated and the inside surface covered with a vapor retarder
 - b. Corridor and tenant demising walls shall not receive gypsum drywall, unless required by code to attain required fire rating.
 - c. Ceilings shall not receive finish material.
 - d. Floor structure for above grade areas shall receive specified concrete topping, but shall not receive finish flooring.
 - e. Floor structure for slab on grade areas shall receive specified sub-grade preparation and material including vapor barrier, but shall not receive concrete floor and slab reinforcing.
- AB. *Work* means the scope of construction work identified in the contents of the Contract Documents.

1.5 01310 PROJECT MEETINGS

- A. Contractor shall schedule and administer project meetings throughout progress of the work at minimum semimonthly intervals, or at mutually agreed upon times.

- a. Make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two (2) business days to Landmark, participants, and those affected by decisions made at meetings.
 - b. Attendance: shall include, but shall not be limited to, the Contractor's home office and field project managers, project supervisors, superintendent, home office and field representatives of major sub-contractors, vendors, and Landmark's Project Executive and / or representative.
 - c. Suggested Agenda: shall include, but shall not be limited to, review of the work progress, and adjustments thereto, deliver of schedules, submittals, maintenance of quality standards, pending delays, substitutions, and other items affecting progress of the work.
 - d. Meeting Minutes: Prepare and distribute job meeting minutes with revisions and with updated 8 1/2" x 11" bar chart schedule attached, to Landmark, Landmark's Architect, all sub-contractors and participants for their review, input, and verification. Job meetings minutes shall be used as the basis for agenda for each meeting. All old business items shall be carried over on the agenda until each item is resolved or deemed unnecessary.
- B. Contractor shall schedule and administer pre-installation conferences with each sub-contractor and Landmark's Project Executive and / or representative.

1.6 01320 PHOTOGRAPHS

- A. Contractor is encouraged to, but is not required to, have pre-construction digital photographs taken of existing adjacent right-of-way, on-site, and adjacent site improvements in close proximity to proposed new construction prior to start of construction
- B. Photographs shall be taken in sufficient quantity, including close-up views where appropriate, to accurately record the existing physical condition of adjacent improvements.
- C. Prints shall be labeled by the photographer on the back of the print. Digital files shall be named. The label and / or file name shall describe the content of each photograph, and shall include the date the picture was taken
- D. Three (3) sets of prints of each photograph, or three complete set of digital files of each photograph shall be provided as a record of preconstruction conditions; One (1) for the Contractor, one (1) for Landmark, and one (1) for the Owner.
- E. Contractor and / or photographer shall keep the negatives or the digital files of each photograph for a period of (3) years after the date the picture was taken.

1.7 01500 TEMPORARY FACILITIES

- A. Temporary Facilities: Temporary water, electrical power, lighting, telephone, field office, sanitary facilities, drinking water, waste disposal, stairs, hard hats, barricades, warning signs, OSHA enclosures, fire extinguishers, partitions, site access roads, etc. shall be provided until the building is substantially complete and turned over to the Owner.

- B. Temporary Sign: A temporary construction sign, 6'-0" x 8'-0", shall be provided, unless otherwise required by local sign ordinance. Information required by Owner shall be included on a 4'-0" x 8'-0" portion of the sign. The remaining portion shall contain Landmark's information.
- C. Temporary facilities, utilities, and security and protection of facilities shall comply with regulations including building code requirements, health and safety regulations, utility company regulations, and environmental protection regulations.
- D. Facilities shall be maintained in good operating condition during construction.
- E. Protection of Adjacent Property
 - a. Contractor shall provide temporary shoring, bracing or other means as required to protect adjacent structures, adjacent streets and site improvements to remain from damage or collapse during the execution of the work.
 - b. Locate and protect existing utilities and utility easements from damage during all operations on or adjacent to the construction site including those in public ways abutting the site.
 - d. Contractor is responsible for design, means and method of achieving protection of adjacent property.
- F. Temporary facilities shall be removed when their need has ended, but no later than substantial completion.
 - a. Damaged work shall be repaired, and construction that can not be satisfactorily repaired shall be replaced.
 - b. Paving, curbs, and sidewalks damaged due to temporary access shall be repaired or replaced.

1.8 01700 TESTING LABORATORY SERVICES

- A. The Owner shall employ and pay for a qualified independent testing laboratory to perform specified services. The Contractor shall assist Landmark and shall coordinate the work. The Contractor shall notify the Owners testing and inspection laboratory for on-site testing and inspections as required in the specification sections.
- B. Written reports of inspections and tests shall be provided to the Owner, Landmark, and the Contractor within forty eight (48) hours of testing and inspection. Landmark and the Contractor shall be notified by phone or fax the same day any failing test is determined. Testing shall be required for, but is not limited to, the following:
 - a. Site Concrete testing and on-site inspections
 - b. Concrete Work testing and on-site inspections

- c. Structural Metal Framing bolt, weld, and ultrasonic testing and on-site inspections
 - d. Cold Formed Metal Framing testing and on-site inspections
 - e. Sprayed-On Fireproofing testing and on-site inspections
- C. The Contractor shall require testing by the sub-contractors of the following:
- a. Mechanical equipment testing, adjusting and balancing
 - b. Piping systems testing, adjusting, and balancing
 - c. HVAC systems testing, adjusting, and balancing
 - d. Electrical systems testing and start-up
- D. Additional testing and inspection services desired by the Owner which are in addition to those provided by Landmark or the Contractor shall be at the Owner's cost. The Contractor shall provide access to the site and materials for the Owner's testing agency. The Owner shall provide Landmark with quality control testing, and inspection reports by the Owner's testing agency for services provided to the Project.

1.9 01720 PROJECT COORDINATION

- A. Lines of Authority: Landmark shall establish on-site lines of authority and communication. All communication between the Owner and the Contractors shall be through Landmark. The Contractor is not authorized to take direction or receive approvals from the Owner.
- B. Layout of Work: The Contractor shall provide layout of Work by using a Professional Engineer or Land Surveyor licensed in the State of the Project shall be used to layout the location of the building and site improvements on the site, shall ensure work is performed in accordance with the site plan, construction drawings, and property survey furnished by the Owner and / or Hospital's Surveyor.
- a. Existing benchmarks established by the Hospital's Surveyor shall be maintained and protected during construction.
- C. Mechanical, Electrical Coordination: The Contractor shall provide the necessary coordination of General, Mechanical, Plumbing, Electrical, Fire Protection, and other Sub-contractors work for the duration of the project. Each sub-contractor shall be responsible for all of their work fitting into place in a neat and concise manner in accordance with the specifications, drawings, and intent of the design, and to the approval of the General Contractor and Landmark.
- D. Manufacturer Recommendations: Equipment and materials shall be installed according to the manufacturer's instructions, and recommendations, unless otherwise specifically direct otherwise in the contract documents. Installation shall be executed to ensure full manufacturer warranties and guaranties are secured.

- E. Changes in Work: When a change in specified or scheduled equipment including the size shown, is made or directed for any reason, the sub-contractor making the change shall be responsible for generating coordination drawings showing the new layout of all equipment affected including required clearances, connection points, and the rerouting of piping, ductwork, and conduit.
- F. Field Office: A copy of all contractor documents, shop drawings, technical data, samples, certifications, manufacturer recommendations, and test reports shall be maintained in the temporary field office.

1.10 01730 CUTTING AND PATCHING

- A. Cutting and Patching: Shall be provided as required for all cutting, patching, or materials properly fitting together as required to complete the Work.
- B. Where cutting and patching involves addition of reinforcement to structural elements, reinforcing shall be coordinated with original structure.
- C. Cutting and patching shall be accomplished in a manner to permit existing operating elements or safety related components to perform as intended.
- D. Existing construction shall be protected during cutting and patching to prevent damage.

1.11 01770 PROJECT CLOSEOUT

- A. Final Clean-up: All final clean-up is intended to leave the building in a condition acceptable for occupancy. Contractor shall be responsible for clearing all cleaned rooms with Landmark's Project Executive when complete. The work related to clean work shall include, but is not necessarily limited to, the following:
 - a. All rubbish, implements and surplus materials shall be removed from the premises.
 - b. All labels which are not permanent labels shall be removed.
 - c. All protective covers such as polyethylene film on light fixtures and elevator door jambs shall be removed.
 - d. Windows, doors, fixtures and floors shall be cleaned of paint specks, paint blemishes, glazing compound and stains and vinyl wallcovering and rubber base cleaned of adhesive, including any required scrapping to remove soiling accumulated during construction.
 - e. All windows shall be washed, inside and out. All glass inside of the building such as sidelights or guardrails shall be washed.
 - f. Clean light fixtures as required and necessary.
 - g. Clean all restrooms including toilets, lavatories, mirrors, grab bars, divider panels and etc.

- h. Plumbing fixtures shall be cleaned to a sanitary condition.
 - i. Clean and polish all stainless steel sinks and fixtures.
 - j. Clean mechanical rooms including equipment and ductwork.
 - k. Clean all mechanical diffusers, grilles and louvers.
 - l. Wash glass and mirrors after labels have been removed.
 - m. Plastic laminate cabinets, countertops, shelves, writing surfaces, and doors shall be dusted and wiped down. Clean-out all cabinet drawers. Remove all stains on plastic laminet
 - n. Carpets shall be vacuumed and all spots shall be removed where required.
 - o. Clean all rubber base and wipe down all vinyl wall finishes.
 - p. Wipe down all plastic laminate doors, door hardware and hollow metal frames.
 - q. Wash vinyl and sheet vinyl floors. Do not wax vinyl floors.
 - r. Granite floor tile and base shall be sealed by others. Refer to Section 09300 – Tile for sealing requirements in the Contract.
 - s. All hard surface flooring and concrete to be left permanently exposed shall be washed.
 - t. Lawns shall be left newly mowed.
 - u. Planters shall be left raked with a fine rake.
 - v. Snow shall be removed from parking lots and walks.
 - w. Paved areas shall be left broom clean.
- B. At completion, permanent facilities that have been used during construction shall be cleaned and renovated.
- a. Air filters shall be placed.
 - b. Toilet rooms shall be cleaned.
 - c. Lamps shall be replaced.
- C. All electrical and mechanical equipment and panels shall be properly labeled.
- D. Equipment concealed above ceilings shall be marked with colored tacks in the ceiling as follows:
- a. Shut off valves Red

- b. Air terminal devices Blue
 - c. Smoke detectors Yellow
 - d. HVAC sensors or devices Brown
 - e. Humidifiers or dehumidifier. Green
- E. Completed construction “as built” record drawings including color coded locations of the above tack identified equipment shall be turned over to Landmark.
- F. Required guarantees on Landmark’s Standard Form listed in each Specification Division and properly executed manufacturer’s guarantees and warranties shall be turned over to Landmark in a bound manual.
- G. “COMPLETION ITEMS” listed in each Specification Division shall be provided.
- H. Operation and Maintenance instructions, parts lists, and equipment brochures shall be provided to Landmark.
- I. Assignable service and maintenance contract proposals shall be provided.
- J. The key to the key cabinet shall be turned over to Landmark and all keys properly labeled within the cabinet.

1.12 01780 SUBMITTALS

- A. General Requirements: Submittals, in the type and quantity listed below, shall be sent to the Architect, “Attn. Quality Control.” The accompanying transmittal should clearly identify the project by name, city and state. The transmittal should identify if the submittal is for Review, for Information, or for Project Close-out. The transmittal should identify the specification section by number and name. A copy of the transmittal shall be sent to Landmark, “Attn. Project Executive.”
- a. Within ten (10) days of contract execution, Contractor must submit the completed “General Contractor Projected Submittal Schedule” listing all Shop Drawings, Samples, and Product Data included in the Specification Divisions under SUBMITTALS. All submittals shall be submitted within eight (8) weeks after start of construction.
 - b. Contractor shall provide a list in triplicate of all items he intends to install in the project for which he has a proprietary name option in the Specifications and which are not required to be submitted as a Shop Drawing. The list shall state the specific brand name or manufacturer, and model number or type for each item.
 - c. In those instances where submittal to Landmark and the Architect is not required by the Specifications, Contractor shall arrange for necessary submittals from his subcontractors and suppliers and coordinate the work of all parties involved.
 - d. All Submittals shall be reviewed by the General Contractor for conformance with the specifications, dimensions, quantities, details, and related work, before they are sent to the

Architect and Landmark. All Submittals shall be stamped "Approved" by the General Contractor. Submittals not indicating Contractor's approval shall be returned without review.

- e. More than two (2) reviews of the same submittal by the Architect necessitated by continuing errors and / or deficiencies will result in additional costs to Landmark. Contractor agrees to reimburse Landmark through a deductive Change Order to the Contract Sum, for all costs associated with such reviews.
- f. Two (2) copies of Submittals, after approval by Contractor and review by the Architect shall be maintained at the site.

B. Submittals For Review:

- a. Prior to fabrication and installation, submit Shop Drawings, and Product Data listed under SUBMITTALS FOR REVIEW in each Specification Division. Work shall be in accordance with reviewed submittals..
- b. Submittal drawings shall be sent to the Architect, and shall include six (6) full size prints (maximum size 30" X 42"), and six (6) Product Data, and Technical Data documents. The Architect shall return three (3) copies of the reviewed submittal to the General Contractor, and one (1) copy of the reviewed submittal to Landmark.
- c. The Architect will review shop drawings for general design compliance. Shop drawing review will require ten (10) working days (excluding mailing time) and does not guarantee completeness nor approval of a substitution.

C. Submittals For Information:

- a. Prior to starting Work, submit information listed under SUBMITTALS FOR INFORMATION in each Specification Division.
- b. Submittals for Information shall not be reviewed by the Architect and shall not be returned to the Contractor. The Contractor shall maintain copies of Submittals for Information as required to coordinate the work.
- c. One (1) copy of the Submittals for Information shall be sent to the Architect, and one (1) copy of the Submittal for Information shall be sent to Landmark.

D. Submittal for Substitution:

- a. A submittal which changes a specified material, product, or design must be accompanied by the reason for the change as well as the cost and schedule ramifications, on a separate letter attached to Contractor's transmittal.
- b. Landmark's or the Architect's review of submittal which change a specified material, product, or design does not constitute authorization to incorporate the item into the project.
- c. A Change Order must be executed before any changes to a specified material, product, or

design can be made.

- d. Contractor shall submit three (3) copies of each request for substitution identifying the product, fabrication, and installation method to be replaced by the substitution; include related Specification Section and Drawing numbers, and complete documentation showing compliance with the requirements for substitutions.
 - e. Include the following information, as appropriate, with each request:
 - i. Provide samples where applicable or requested.
 - ii. Provide a detailed comparison of the significant qualities including elements such as size, weight, durability, performance and visual effect where applicable.
 - iii. Provide complete coordination information. Include all changes required in other elements of the Work to accommodate the substitution, including work performed by separate contractors.
 - iv. Provide complete cost information, including a proposal of the net change, if any, in the Contract Sum.
 - f. By making a request for a substitution, Contractor:
 - i. Represents that Contractor has personally investigated the proposed substitute product and determined that it is equivalent or superior in all respects to that specified, and is suitable for the intended purpose
 - ii. Represents that Contractor will provide the same warranty for the substitution that Contractor would for that specified.
 - iii. Certifies that the cost data presented is complete and includes all related costs except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent.
 - iv. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
 - g. Once the change order has been executed, the contractor shall follow the Submittal for Review requirements listed above.
- E. Submittals For Project Closeout:
- a. Prior to Substantial Completion, submit information listed under Submittals for Project Closeout in each Specification Division.
 - b. Contractor shall compile all Submittals for Project Closeout, and shall submit a 100% complete set of documents to the Architect after review and confirmation that the Submittal is complete.
 - c. Submittals shall be sent to the Architect, and shall include three (3) original documents. The Architect shall return one original of the reviewed submittal to Landmark, and shall return two (2) originals of the reviewed submittal to the Owner.
 - d. The Architect will review Submittal for Project Closeout for conformance with the Contract Documents. Submittal review will require ten (10) working days (excluding mailing time) and does not guarantee completeness nor approval.

1.13 01781 GUARANTEES AND WARRANTIES

- A. Any defects due to faulty materials or workmanship, which appear during the progress of the Work or within a period of one year from the date of completion and acceptance of the Work shall be remedied. Any consequent damage caused by any such defect shall be corrected.
- B. Where there is a trade guarantee or special guarantee for a period in excess of one year, the longer period shall apply and any documents required to affect such guarantees shall be furnished. Neither the final payment nor final acceptance shall relieve Contractor for negligence or faulty materials, nor shall any defects be remedied promptly upon written notice.
- C. As part of the completion documents, specific guarantees from each subcontractor or supplier as required by the Specifications, on Landmark's Standard Guarantee Form shall be provided. In addition, manufacturer's guarantees and warranties for materials and equipment installed in the Work shall be provided. All guarantees shall be provided in triplicate.

1.14 01930 CLARIFICATION AND PROPOSALS (Change Orders)

- A. Written Change Orders will be issued for change occurring as follows:
 - a. Adjustments which occur as a result of incorporating final suite designs or changes to the building shall be made in accordance with the "ALLOWANCES AND UNIT COST ADJUSTMENT SCHEDULES".
 - b. Cash Allowance changes shall be adjusted on the basis of actual cost. All allowances set forth in the Specifications or Exhibits shall be an actual cost amount. No fee applies to these adjustments.
 - c. Changes in the Work may be required which are not anticipated by allowances or unit costs. The total cost for any added work shall not exceed a credit for the same or similar deleted work. Cost shall be defined as actual cost excluding supervision costs and office overhead which shall be included as part of the fee percentage set forth in EXHIBIT "G".
- B. Upon notification from Landmark of a proposed change, Contractor and his subcontractors shall prepare a quotation itemizing the detailed changes to the Contract Sum, in a breakdown form itemizing labor and material in detail showing quantities and unit prices if applicable, including written quotes from manufacturers and suppliers. The changes shall also be recapped by major billing categories with overhead and profit distributed. Quotes for any requested change shall be provided within ten (10) days.
- C. Should additional work be commenced without an executed Change Order, it shall be deemed an unconditional waiver of any additional compensation or to an extension of the time of completion.
- D. Should disagreement occur on the quoted amount of a change, Landmark may request three (3) independent written quotes on each item of the change, or, a Change Order may be issued to perform the Work required by the change on the basis of actual cost. In this event, all time sheets, material delivery tickets and invoices, and equipment rental receipts, and invoices

which document the Work performed each day shall be provided to Landmark for daily signature. Unused materials for the original work shall be credited in full as invoiced. Unused labor and equipment rental for the original work shall be credited in an amount equal to the cost of similar work for this project. Only added material cost, cost of equipment when in use, cost for added labor incorporated in the change shall be a proper charge. Labor rates shall not exceed the Local Rate Determination by the Secretary of Labor plus the proper and required fringe benefits. Equipment rental rates shall be no more than the rates as determined by Associated Equipment Distributors Index. All equipment shall be properly operated, maintained and insured. Only fees as set forth in EXHIBIT "G" shall apply to the net cost of any such change. The execution of a change in the Work under this paragraph shall not interfere with the normal and orderly job progress, which shall continue without interruption. On completion of the Work, an additional Change Order will be issued to adjust the final cost.

- a. Landmark's review of quotations does not constitute approval for or guarantee of the completeness of any change, which is specifically the responsibility of Contractor.
- b. At completion, a final Change Order will be issued to adjust the change in the cost of bond premiums, if any, resulting from changes to the original Contract Sum due to Change Orders issued during the course of construction. No fee applies to this adjustment.

1.15 01950 EQUAL OPPORTUNITY

- A. Contractor and Contractor's subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor's subcontractors shall agree to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.
- B. Contractor and Contractor's subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

END 01100

DIVISION 3 - CONCRETE
Section 03300 - Cast-In-Place Concrete

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete formwork, expansion filler, control joints, reinforcing, accessories, and cast-in-place concrete for footings, foundations, slab on grade, metal stair pan fill, metal deck fill, and rooftop mechanical equipment pads shall be provided as indicated on the Drawings.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Reinforcing drawings detailing of fabrication, bending, and placement prepared in accordance with ACI 315, "Details and Detailing of Concrete Reinforcing". Include material, grade, bar schedule, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcing.
- B. Product Data: Provide data on joint devices, attachment accessories, admixtures.
- C. Mix Design: Provide concrete mix design.
- D. Provide mill certification for all reinforcing steel.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Accurately record the actual locations of embedded utilities and components in concrete work which are concealed from view.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - a. ACI 117 "Specifications for Tolerances for Concrete Construction and Materials".
 - b. ACI 301 "Specifications for Structural Concrete for Buildings".
 - c. ACI 318 "Building Code Requirements for Reinforced Concrete".
 - d. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".
 - e. ACI 315 "Manual of Standard Practice."
 - f. ACI 347 "Recommended Practice for Concrete Formwork".
 - g. CRSI "Recommended Practice for Placing Reinforcing Bars".

- h. CRSI “Manual of Standard Practice”.
 - i. AWS 01.4 “Structural Welding Code – Reinforcing Steel.”
- B. Acquire cement and aggregate from same source for all work.
- C. Conform to ACI 305R when concreting during hot weather.
- D. Conform to ACI 306R when concreting during cold weather.
- E. Owner Testing:
- a. Owner shall employ and pay for a qualified testing and inspection laboratory to perform concrete testing and on-site inspection services during site concrete work. Written reports of the inspections, observations, and testing shall be provided to Landmark within 48 hours of test and inspections. Landmark shall notify by phone or fax the same day if any failing test is determined.
 - b. Contractor shall provide free access to the Work. Contractor shall notify the Owner’s independent testing laboratory of scheduled pours. If Contractor fails to notify the Owner’s independent testing laboratory, and as a result, no cylinders are taken, Contractor shall bear the cost of verifying that the in place concrete meets the strength requirements of these specifications. Cores shall be extracted and tested from the cast-in-place concrete in accordance with ASTM C42. Location of cores shall be determined by Landmark.
 - c. Contractor shall submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
 - d. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
 - e. A minimum of 4 test cylinders for each day’s pour shall be taken for every 100 or less cu yds of each class of concrete placed each day and standard 7 and 28 day compression tests, certified by the independent materials laboratory, shall be made. One cylinder shall be held for later use, if necessary.
 - f. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.
 - g. Test cylinders specified to exceed 3,000 psi and concrete deck fill shall be cast by the Owner’s independent materials laboratory.
 - h. All testing shall be in accordance with ACT 318.95 Section 5.6.
 - i. One slump test will be taken for each set of test cylinders taken.
 - j. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.
 - k. If any quality control testing paid for by the Owner indicates that materials do not meet

the requirements of these specifications, all retesting to verify compliance shall be paid for by the Contractor.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F. or surface is wet or frozen.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Type I – Normal, Type IA – Normal Air Entraining Type II – Moderate, Type IIA – Moderate Air Entraining, Portland type.
- B. Fine and Coarse Aggregates: Normal weight aggregates; ASTM C33. Light weight aggregates; C330. Local aggregates not complying with ASTM C33 or C330, but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used.
- C. Water: Potable complying with ASTM C94.

2.2 ADMIXTURES

- A. Chlorides and additives containing chloride ions shall not be used.
- B. Air Entrainment: ASTM C260
 - a. Concrete which will be exposed to temperatures below 32 degrees F. shall be air entrained.
 - b. Average air content shall be five (5) to seven (7) percent in accordance with ACE 302IR, Table 5.2.7a.
- C. Fly Ash: ASTM C618 Class C.
- D. Admixtures complying with ASTM C494, Type A may be used as a water reducer as required for placement and workability.

2.3 FORMWORK

- A. Formwork for Exposed Concrete; shall be “Duraply” metal, metal-framed, “Duraply” metal-faced or other panel-type materials, to provide continuous, straight, smooth, exposed surfaces.
 - a. Formwork shall be furnished in the largest practicable sizes, based on the forming system used, to minimize the number of joints.
 - b. Form material shall withstand pressure of newly-placed concrete without excessive bowing or deflecting.
- B. Formwork for Unexposed Concrete; shall be formed with plywood, lumber or metal.

- a. Lumber dressed on at least two edges and one side shall be provided for tight fit.
 - b. Forms shall be of material, size, and strength to resist movement during concrete placement, and to retain horizontal and vertical alignment.
 - c. Flexible spring steel or laminated boards shall be used to form curved surfaces.
 - d. Where excavation maintains a firm clean shape and can be held true to line and grade, earth forms may be used, if allowed by code.
- C. Form-coating compounds; One of the following equal manufacturers and products may be used:
- a. Symons Manufacturing Company, "Magic Kote Form Coating" (www.symons.com)
 - b. W.R. Meadows, Inc., "Durogard Plus" (www.wrmeadows.com)
 - c. Chem-Masters Corporation, "Formlock"
 - d. Additional approved equal products shall be considered

2.4 ACCESSORIES

- A. Vapor Retarder: 6 mil thick polyvinyl chloride vapor barrier, type recommended for below grade application.
- B. Non-Shrink Grout: ASTM C1107 and CRD C621, premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days; One of the following approved manufacturers shall be used:
 - a. Master Builders, Masterflow 928.
 - b. Additional approved equal products may be considered.
- C. Waterstop; shall be Vinylex Corporation, #RSB-9-316 (www.vinylex.com) or approved equal.
- D. Dowel caps; shall be 5" long plastic or steel of diameter required by bar size.
- E. Expansion bolts; shall be wedge anchors per Federal Specification FS-FF-S-325, Group II, Type 4, Class 1.
- F. Adhesive or bonding agent shall be two component epoxy for use on dry or damp surfaces complying with ASTM C881
- G. Patching and Surface Compounds: One of the following equal manufacturers and products shall be used:
 - a. H.B. Fuller, "Resiweld 7640 Serise with sand aggregate"

- b. Sika Chemical Company, “Colma Dur”
- c. Protex-A-Coat Inc., “Chemcrete”
- d. Additional approved equal products shall be considered..

2.5 JOINT DEVICES AND FILLER MATERIALS

- A. Concrete Expansion Filler: 1/4” thick asphalt impregnated compressible filler material conforming to ASTM D1751 shall be provided where slabs on grade meet vertical surfaces.
- B. Concrete Control and Construction Joints: Preformed bulkheads for slabs shall be rigid preformed material to provide indicated keyways. Control joints shall be saw-cut or tooled.

2.6 REINFORING

- A. Bars shall comply with ASTM A615, Grade 60.
- B. Welded wire mesh shall comply with ASTM A185.
- C. Form ties shall be factory fabricated, adjustable length, removable or snap off metal, designed to prevent concrete surfaces spalling and form deflection.
 - a. Furnish units that will leave no corrodible metal closer than 1” to the plane of the exposed concrete surface.
 - b. Furnish units that, when removed, will leave holes not larger than 1” in diameter in concrete surface.
 - c. Furnish units with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing membrane.
- D. Tie wires and spirals shall be sixteen (16) gauge annealed steel wire, per ASTM A82.
- E. Chairs, spacers, supports and other accessories shall be standard manufacture conforming to ACI 315.
- F. Anchor bolts and embedded plates conforming to ASTM A36
- E. Epoxy coated reinforcing bars shall conform with ASTM A615 and ASTM A775.

2.7 CONCRETE MIX

- A. Concrete Proportioning, and Design Mix: shall be prepared by an independent testing facility retained by Contractor and shall follow the requirements stated on the Drawings.
 - a. If no requirements existing on the Drawings, use the trial batch method as specified in ACI 301 and ACI 318, chapter 5, “Proportioning on the basis of field experience and / or trial mixtures”.

- b. Mixes shall meet the minimum requirements indicated on the Structural Drawings, and the following (whichever is greater):
 - i. Slabs on grade: 3500 psi (1800 psi at 3 days) 28 day compressive strength normal weight concrete.
 - ii. Footings, grade beams, pile caps and foundation walls: 3,000 psi 28 day compressive strength normal weight concrete.
 - iii. Composite deck fill: 4000 psi 28 day compressive strength [normal] light weight concrete.
 - iv. Other concrete: 3000 psi compressive strength normal weight concrete.
 - c. Fly ash shall be used as a pound for pound replacement for cement for up to 15 percent of the total cementitious content.
- B. Concrete Slump: Concrete shall arrive at the jobsite at 2” or 3” slump. After verification, a water reducing admixture may be added to increase slump to the specified level. Mixes shall result in concrete slump at point of placement as follows:
- a. Ramps and sloping surfaces: Not more than 3”.
 - b. Reinforced foundation systems: Not less than 2” and not more than 4”.
 - c. Other concrete: Not more than 4”.
- C. Use accelerating admixtures in cold weather only when approved by Landmark. Use of admixtures will not relax cold weather placement requirements.
- D. Ready mix concrete shall conform to ASTM C94.
- E. Chlorides and additives containing chloride ions shall not be used.
- F. Use set retarding admixtures during hot weather only when approved by Architect.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify that compacted subgrade and granular base elevations and condition is acceptable and ready to support slab on grade.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete,

- insert steel dowels and pack solid with non-shrink grout.
- C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.
 - D. Refer to Section 13090 – X-Ray Protection for special construction for RFI Shielding requirements and coordinate work with the Drawings for special concrete reinforcing requirements.
 - E. Notify Landmark minimum 24 hours prior to commencement of concreting operations.

3.3 FORMING

- A. Formwork design shall be the responsibility of the Contractor.
- B. Place and secure forms to correct location, dimension, profile, and gradient. Clean thoroughly of all wood, sawdust, dirt and other debris prior to placing concrete.
- C. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- D. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.
- E. Form Tolerance: Alignment of vertical face shall not deviate more than 1/4" in 10'-0", and the top of forms shall not deviate more than 1/8" in 10'-0".
- F. Formwork shall be readily removable without impact, shock or damage to cast-in-place concrete surface.
- G. Coordinate openings, recesses, chases, etc. with other trades.
- H. Locate temporary openings in formwork in inconspicuous locations for interior area where formwork would make area inaccessible for Work.
- I. Form Coating:
 - a. Contact surfaces of forms shall be coated with form-coating compound prior to placement of reinforcement.
 - b. Excess form-coating material shall not be allowed to accumulate in forms or to come into contact with in-place concrete surface against which fresh concrete will be placed.
 - c. Steel forms shall be coated with non-staining, rust-preventative from oil or shall be otherwise protected against rust.
 - d. Wood forms shall be moistened immediately before placing concrete when form coatings are not used.
- J. Form Removal:

- a. Formwork not supporting weight of concrete, such as sides of beams, walls and columns, may be removed after concrete has cumulatively cured at not less than fifty (50) degrees F. for 24 hours and provided curing and protection operations are maintained.
- b. Formwork supporting weight of concrete, such as slabs and other structural elements, shall remain in place until concrete has attained seventy five (75) percent of its twenty-eight day design strength.

3.4 REINFORCEMENT

- A. Place reinforcement as indicated, and support against displacement from concrete placement.
- B. Interrupt reinforcement at contraction and expansion joints.
- C. Clean reinforcement before placement of all materials that will reduce or destroy bond with concrete. These materials shall include, but not be limited to, rust, mill scale, earth, ice, etc.
- D. Place reinforcing to obtain at least the minimum coverage for concrete protection. Wire ties shall be set directing ends into concrete, not toward exposed concrete surfaces.
- E. Welded wire fabric shall be placed in lengths as long as practicable. Adjoining pieces shall be overlapped at least one (1) mesh plus 2" and laced with wire. Adjacent end laps shall be offset to prevent continuous laps in either direction.

3.5 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints.
- D. Place concrete continuously between predetermined expansion, control, and construction joints.
- E. Do not interrupt successive placement; do not permit cold joints to occur.
- F. Place floor slabs in checkerboard or saw cut pattern indicated.
- G. Install vapor retarder under interior slabs on grade. Lap joints minimum 6" and seal watertight by taping edges and ends.
- H. When hot weather conditions exist, ingredients shall be cooled before mixing to maintain concrete temperature at time of placement below 90 degrees F.
- G. Concrete work shall be protected from frost and freezing actions or low temperatures. When air temperature has fallen to or is expected to fall below 40 degrees F., water and aggregates shall be uniformly heated before mixing to obtain a concrete temperature of not less than 50 degrees F. and not more than 80 degrees F. at point of placement.

- H. Concrete shall not be placed on subgrade containing frozen materials and frozen materials shall not be used in the concrete mix.
- I. Reinforcing steel shall be covered with water soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete. Reinforcing steel, forms, and subgrade shall be fog sprayed just prior to concrete placement.
- J. Concrete shall be struck off and consolidated with a vibrator, keeping the vibrator away from side of forms. Segregation of mix shall be prevented.
- K. Bonding agent shall be used at locations where fresh concrete is placed against hardened or partially hardened concrete.
- L. Concrete shall be placed and spread in continuous operation. Construction joints shall be placed where pours are interrupted for 1/2 hour or more.
- M. Surface concrete shall be smoothed by screening and floating.
- N. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4" inch in 10 ft.

3.6 JOINTS

- A. Locate joints to avoid impairing strength and appearance.
- B. Separate slabs on grade from vertical surfaces with 1/4" inch thick joint filler.
 - a. Install joint fill devices in accordance with manufacturer's instructions.
 - b. Extend joint filler from bottom of slab to within 1/4" inch of finished slab surface.
- C. Control and construction joints shall be at column center lines and shall have a maximum panel size of 15'-0" x 15'-0", unless otherwise indicated on the Drawings.
 - a. Joints shall be accomplished by saw cutting within 4 to 16 hours after finishing using a 3/16" thick blade cutting into 1/4 depth of the slab thickness.
 - b. Run construction joints perpendicular to main reinforcing. Reinforcing shall be continuous through wall construction joints.
- D. Keyways at least 1 1/2" deep shall be provided in construction joints in walls. Bulkheads designed for this purpose may be used in slabs on grade.
- E. Joints between slab on grade and supported slab shall utilize embedded dowel system.
 - a. "Diamond Dowel System" as manufactured by PNA Construction Technologies, or approved equal.

- b. Location and spacing of dowels shall be as detailed on the Drawings.
- F. Interruption of concrete placement of one hour or more will require cold joint installation.
 - a. Surface laitance shall be removed and the surface slushed with a 1 to 1 cement grout or bonding agent shall be applied.
- b. Install adhesive or bonding agent in accordance with manufacturer's instructions.

3.7 FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301.
- B. Formed concrete not exposed to view shall be rough finished. Ties shall be removed, tie holes and defective areas in contact with soil shall be repaired, and patched, and fins and other projections exceeding 1/4" in height shall be rubbed down or chipped off.
 - a. Exterior concrete surfaces exposed to view, or that are to receive a finish coating, shall be smooth finish. Ties shall be removed, fins and other projections exceeding 1/4" in height shall be rubbed down or chipped off, and completely removed. Tie holes and defective areas shall be repaired and surface filled, sacked, rubbed, and left smooth with uniform texture.
 - b. Surfaces at top of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces shall be struck off smooth and finished with a texture matching adjacent formed surfaces.
 - c. Exposed concrete stair treads, ramps, and landing shall receive a medium broom finish to provide a non-slip surface.
 - d. Wood float surfaces which will receive quarry tile, or ceramic tile with full bed setting system.
- C. Float and steel trowel surfaces which will receive carpeting, resilient flooring, seamless flooring, thin set ceramic tile.
- D. Float and steel trowel surfaces which are scheduled to be exposed, other than exposed stair treads, ramps, and landings.
- E. Interior equipment pads or curbs shall receive monolithic finish by stripping forms while concrete is still green and steel trowel surfaces to a hard dense finish with corners, intersections, and terminations slightly rounded.
- F. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal, and be puddle free.

3.8 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold

- temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - C. Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 4 days.
 - D. Spraying: Spray water over floor slab areas and maintain wet for 7 days.
 - E. Absorptive Cover: AASHTO M182, Class 2, moisture-retaining cover complying with ASTM C171.
 - F. Liquid membrane forming curing compound complying with ASTM C309, Type I, Class A.
 - G. Moisture curing in accordance with ACI 308.

3.9 PATCHING

- A. Defective Concrete: Concrete with honeycomb, embedded items, or not conforming to required lines, details, dimensions, tolerances or specified requirements.
 - a. Repair or replacement of defective concrete will be determined by the Landmark.
 - b. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Landmark for each individual area.
 - c. Allow Landmark to inspect concrete surfaces immediately upon removal of forms.
- B. Patch imperfections as directed and in accordance with ACI 301.
- C. Surface defects in exposed exterior concrete such as color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning shall be repaired with cement mortar immediately after removal of forms.
 - a. Patching material for exterior exposed to view surfaces to remain unfinished shall be white Portland cement and standard Portland cement blended so that, when dry, patching mortar will match surrounding color.
 - b. A test area shall be provided in an inconspicuous location to verify mixture and color match.
 - c. Mortar shall be compacted in place and struck off slightly higher than the surrounding surface.
- D. High areas in slabs that would telegraph through finish floor coverings shall be corrected by grinding after concrete has cured at least 14 days.
- E. Low areas in slabs shall be corrected during or immediately after completion of surface finishing. Repair areas shall be finished to blend into adjacent concrete.

3.10 TOLERANCES

- A. Footings and grade beams, other than those supporting masonry construction: Variation of bearing surface from specified elevation - plus or minus 1/2".
- B. Footings and gradebeams supporting masonry construction:
 - a. Variation of center from specified location in plan: plus or minus 1/4" in any 10' but not to exceed plus or minus 1/2".
 - b. Variation of bearing surface from specified elevation: plus or minus 1/4" in any 10' but not to exceed plus or minus 1/2".
- C. Variation in the lines and surfaces of columns, piers and walls: 1/4" in any 10'.
- D. Thickness of walls and slabs:
 - a. 12" or less: plus 3/8", minus 1/4".
 - b. Greater than 12": plus 1/2", minus 3/8".
- E. Elevation from specified elevation for walls: plus or minus 1/2".
- F. Location of anchor bolts and sleeves:
 - a. From specified location in plan: plus or minus 1/4".
 - b. From specified elevation: plus or minus 1/4".
- G. Surface of flatwork: 1/8" as measured from a 10' straightedge.

3.11 SCHEDULE - CAST-IN-PLACE CONCRETE

- A. Refer to the Drawings for specific configurations.
- B. Footings shall be a minimum of 12" thick, and 6" wider than the supported wall. Footings supporting masonry walls shall be reinforced with a minimum of two #5 bars continuous.
- C. Interior slabs on grade shall be 4" thick reinforced with 6" x 6" x W1.4 x W1.4 wire fabric. Areas to be left undeveloped on grade shall not receive a floor slab to allow for the future installation of plumbing waste lines.
- D. Metal deck fill shall be minimum 3-1/2" thick measured from top of metal deck flutes and shall be reinforced with minimum 6" x 6" x W2.1 x W2.1 flat sheet wire fabric.
- E. 4" thick minimum, thickened edge, flat concrete platform beneath roof mounted HVAC equipment with mason curb. Provide concrete reinforced with 6" x 6" x W1.4 x W1.4 flat sheet wire fabric. Rigid insulation shall be installed below the concrete platform, and shall account for the sloping roof deck.

END 03300.

DIVISION 5 – METALS
Section 05120 - Structural Steel

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel for the building frame, floor structure, roof structure, framed openings, support for Tenant equipment, and miscellaneous other steel as indicated on the Drawings.

1.2 SUBMITTALS FOR REVIEW

- A. Steel Shop Drawings:
 - a. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, connections, and fasteners.
 - b. Indicate cambers, and loads.
 - c. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld size, length, and type. Distinguish between shop and field welds.
 - d. Anchor bolt setting plans.
 - e. Include embedment drawings.
 - f. Steel connections indicated to comply with design loads, include structural calculations prepared by qualified professional engineer responsible for their preparation.
- B. Certification and Test Results:
 - a. Mill certificates for all structural steel.
 - b. Fabricator certification that steel represented by the submitted mill certificates was used on the project and includes all structural steel used on the project.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - a. AISC “Code of Standard Practice for Steel Buildings”.
 - b. AISC Section 10.
 - c. AISC “Specification for Design, Fabrication, and Erection of Structural Steel for Buildings”.
 - d. AISC “Seismic Provisions for Structural Steel Buildings”, and “Supplement No. 2”.

- e. AISC “Specifications for Structural Steel Buildings – Allowable Stress Design and Plastic Design”.
 - f. AISC “Specification for the Design of Steel Hollow Structural Sections”.
 - g. AISC “Specification for Allowable Stress Design of Single – Angle Members”.
 - h. RCSC “Specification for Structural Joints using ASTM A325 or A490 Bolts”.
 - i. AWS D1.1 “Structural Welding Code – Steel”.
 - j. ASW “Standard Qualification Procedure”.
- B. Fabricator: Company specializing in performing the work of this section with minimum 10 years documented experience.
- C. Erector: Company specializing in performing the work of this section with minimum 10 years documented experience.
- D. Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.
- E. Owner Testing:
- a. Owner shall employ and pay for a qualified testing and inspection laboratory to perform steel testing and on-site inspection services during Work. Written reports of the inspections, observations, and testing shall be provided to Landmark within 48 hours of test and inspections. Landmark shall notify by phone or fax the same day if any failing test is determined.
 - b. Contractor shall provide free access to the Work. Contractor shall notify the Owner’s independent testing laboratory of scheduled Work. If Contractor fails to notify the Owner’s independent testing laboratory, and as a result, tests are not performed, Contractor shall bear the cost of verifying that the in place steel meets the requirements of these specifications.
 - c. Testing shall verify that gaps of direction tension indicator on high strength bolts are less than gaps specified in ASTM F-959, Table 2.
 - d. Field welds in structural steel, steel joists connections and steel deck shall be visually inspected. All suspect welds shall be magnetic particle tested.
 - e. Each welder’s certification shall be inspected for conformance to electrode and type of weld prior to commencement of welding.
 - f. Testing shall verify that automatic welding of headed and dowel type stud shear connections complies with the manufacturer’s printed instructions and that completed

welds meet the manufacturer's requirements for full strength development of the headed stud.

- g. Ultrasonic testing ASTM E164 shall be performed on all full penetration welds.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Structural steel for wide flange and tee shapes: ASTM A992, Grade 50.
- B. Structural steel plates, angles, channels, threaded rods, and bars: ASTM A36.
- C. Structural steel B-line clips: ASTM A36.
- D. Tube steel: ASTM A500, Grade B, $F_y = 46,000$ psi.
- E. Structural pipe: ASTM A53, Grade B, type E or S.
- F. Anchor rods shall comply with ASTM F1554, Grade 36 unless otherwise noted.
- G. Threaded rod shall comply with ASTM A36.
- H. Deformed bar anchors shall comply with ASTM A496 and ICBO Report ER-5217.
- I. High strength threaded fasteners shall be minimum 3/4" diameter and shall conform to ASTM A325 N with direct tension indicators conforming to ASTM F959, or break off -(twist-off) type bolts.
- J. Welded connections shall be made with type E70xx electrodes.
- K. Welding Materials shall comply with AWS D1.1; type required for materials being welded.
- L. Sliding bearing plates shall be Teflon coated.
- M. Headed stud shear connectors shall be cold finished carbon steel conforming to ASTM A108, Grade 1015 through 1020, Type B.
- N. Grout: As specified in specification Section 03300 – Cast-In-Place Concrete
- O. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
- P. Touch-Up Primer for Galvanized Surfaces: SSPC 20 Type I Inorganic

2.2 FABRICATION

- A. Fabricate and assemble structural steel in the shop to the greatest extent possible.
- B. Steel to remain permanently exposed shall be fabricated from materials which are smooth and

free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Blemishes shall be removed by grinding or by welding and grinding, prior to cleaning and application of shop paint.

- C. Space shear stud connectors at as indicated on the Drawings.
- D. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- E. Develop required camber for members.
- F. Plates for steel items bearing on masonry or concrete construction shall be made flat, free of warps or twists.
- G. Shelf angles and loose lintels shall be fabricated from steel angles and shapes of sizes required to support the structural loads, and as indicated on the Drawings.
- H. Splices and connections not shown on the Drawings shall be designed by the Contractor to develop the full strength of the largest connecting member and shall be submitted as a separate shop drawing.
- I. Mark and match mark materials for field assembly.
- J. Materials shall be fabricated for delivery sequence to expedite erection and minimize field handling of materials.
- K. Connections:
 - a. Field connections may be bolted, nut and washer or welded, as indicated on the Drawings.
 - b. High strength threaded fasteners shall be used for bolted connections.
 - c. Welded connections shall comply with AWS Code for procedures, appearance and quality of welds, and for methods used in correcting welding work.
 - d. Welds shall be ground smooth where steel is to remain permanently exposed.

2.3 FINISH

- A. Prepare structural component surfaces in accordance with SSPC SP2.
- B. Shelf angles and loose angle lintels located in exterior walls and other steel exposed to the exterior such as roof screen framing shall be galvanized. Galvanizing shall be hot dipped complying with ASTM A153 or ASTM A123.
- C. Steel to remain permanently exposed to view which is not galvanized, and which is scheduled to be painted, shall be cleaned of loose rust, loose mill scale, and spatter, slag, or flux deposits prior to painting.
 - a. Steel shall be cleaned and painted in accordance with the Steel Structures Painting Council

(SSPC).

- b. One-coat shop applied primer shall be provided with dry film thickness of 1.5 mils minimum meeting requirements of Federal Specification TT-P-636D. The primer shall be factory applied.
- D. Steel to receive sprayed on fireproofing shall be mill finished (not galvanized, primed or painted) and shall be cleaned of oil and other substances which may harm the adhesion of sprayed on fireproofing.
- E. All other steel shall be unfinished.

2.4 SOURCE QUALITY CONTROL AND TESTS

- A. Provide shop testing and analysis of structural steel sections, if required by code.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 ERECTION

- A. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- B. Align structural frame and adjust forming a part of a complete frame or structure before permanently fastening. Individual members shall be leveled and plumbed within specified AISC tolerances.
- C. Members shall be spliced only at designated locations indicated on the Drawings and Shop Drawings.
- D. Field weld components and shear studs indicated on Drawings and Shop Drawings.
- E. Field connect members with threaded fasteners; torque to required resistance.
- F. Do not field cut or alter structural members without approval of Landmark and the Engineer.
- G. On exposed welded construction, erection bolts shall be removed and holes filled with plug welds ground smooth.
- H. Improper holes shall not be enlarged in members by burning or by the use of drift pins. Holes that must be enlarged to admit bolts shall be reamed.
- I. Gas cutting torches shall not be used in the field for correcting fabrication errors in structural framing, except on secondary members which are not under stress.

- J. Brick shelf angles welded to structural elements shall be installed string-line straight and plumb. Juncture between adjacent angles shall be held to 3/8" apart to allow for expansion.
- K. Angles or steel support framing of size required to carry roof and equipment loads shall be provided with reinforced openings. Roof deck openings greater than 10" perpendicular to the deck flutes shall be supported.
- L. Grout under base plates and as indicated on Drawings. Trowel grouted surface smooth, splay neatly to 45 degrees.

3.3 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4" per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4".

END 05120.

DIVISION 5 - METALS
Section 05550 – Medical Equipment Support System

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Medical equipment support system including metal framing material, fittings, and related strut system accessories

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - a. Submit design calculations for the Medical Equipment Support System prepared by and stamped by a Professional Engineer registered in the State of the project.
- B. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.3 QUALITY ASSURANCE

- A. Products shall be designed to meet seismic design and product requirements to meet applicable codes.
- B. Products specified shall be installed to the following criteria, unless noted otherwise on the Drawings:
 - a. Support structure members at the ceiling plane shall be located to allow installation of standard modular 2'-0" ceiling tile grid, fixtures and other equipment indicated on the Drawings.
 - b. System shall be designed to allow attachment of medical equipment at any point of the support system.
 - c. Wherever possible, attachment to ceiling structure shall be by means of embedded concrete inserts, through-bolts or by direct attachment to structural framing.
 - d. The system shall be designed to a minimum safety factor of three based on the ultimate strength under static loading conditions.

1.4 QUALIFICATIONS

- A. Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel sections: ASTM A 36 and ASTM A 283, Grade C.
- B. Steel sheet for cold-forming: ASTM A 569
- C. Steel tubing: ASTM A 500, Grade B and ASTM A 513
- D. Pipe: ASTM A 53, Grade B, Schedule 40
- E. Bolts, Nuts, and Washers: ASTM A325
- F. Welding Material: AWS D1.1, type required for materials being welded.
- G. Threaded Rods: ASTM A 36, 77a
- H. A minimum 2.0 mil dry film thickness shop primer shall be applied to uncoated surfaces of metal fabrications except those with galvanized finish or to be embedded in concrete or masonry.

2.2 MEDICAL EQUIPMENT SUPPORT SYSTEM

- A. Channel members shall be fabricated from structural grade steel conforming to ASTM A 570 GR 33 or A 446 GR A. All fittings shall be fabricated from steel conforming to ASTM A575, A 576, A36 or A635. The mounting surfaces of the strut system shall be horizontal within the tolerance of 1/32" in 24" and within 1/16" in an 18' length. The elevation of one rail mounting surface to the other shall be within 1/16" in any 24" length of the rails.
- B. One of the following equal manufacturers and products may be used:
 - a. Unistrut Corporation (www.unistrut.com)
 - b. Additional approved equal products shall be considered

2.3 FABRICATION

- A. Steel to remain permanently exposed shall have welds ground smooth and comply with AISC specifications for Architecturally Exposed Structural Steel.
- B. Fit and shop assemble items in largest practical sections, for delivery to site.
- C. Fabricate items with joints tightly fitted and secured.
- D. Continuously seal joined members by [intermittent welds and plastic filler.] [continuous welds.]
- E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

- F. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- G. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.4 FABRICATION TOLERANCES

- A. Squareness: 1/8" maximum difference in diagonal measurements.
- B. Maximum offset between faces: 1/16".
- C. Maximum misalignment of adjacent members: 1/16".
- D. Maximum bow: 1/8" in 48".
- E. Maximum deviation from plane: 1/16" in 48".

2.5 FINISHES - STEEL

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime paint items with one coat.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on Drawings, and shop drawings.

- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.4 ERECTION TOLERANCES

- A. Maximum variation from plumb: 1/4" per story, non-cumulative.
- B. Maximum offset from true alignment: 1/4".
- C. Maximum out-of-position: 1/4".

END 05450

DIVISION 6 - WOOD AND PLASTICS
Section 06100 – Rough Carpentry

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Lumber, plywood, fasteners, adhesives, preservative treatment, fire treatment, and miscellaneous other rough carpentry as indicated on the Drawings.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide technical data and application instructions on wood preservative materials, and fire treatment.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following agencies:
 - a. Lumber Grading Agency: Certified by ALSC.
 - b. Plywood Grading Agency: Certified by APA.
- B. Grade stamp lumber and plywood in conformance with grading rules of the American Plywood Association, Western Spruce-Pine-Fir Association, and Western Wood Products Association as appropriate.
- C. In lieu of grade stamping exposed to view lumber and plywood, submit manufacturer's certificate certifying that products meet or exceed specified requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Dimensional Lumber; shall be Douglas Fir-Larch No. 2, visually graded by Standards of Western Wood Products Association, and WWPA, S4S, dried to 19% maximum moisture content.
- B. Grounds, nailers, bucks, and shims; shall be Douglas Fir, White Fir, Pine, Eastern Hemlock, or Spruce, No. 1, and WWPA, S4S, dried to 19% maximum moisture content
- C. Plywood, Interior Use; shall be APA A-C, Group 1, exterior, thickness as indicated on drawings
 - a. Telephone backboards shall be 3/4" fire-rated A-C plywood mounted with "A" side exposed at 2'-0" above the floor to the bottom of the backboard.
 - b. Miscellaneous Concealed Plywood: Exposure sheathing, span rating to suit framing in each location and thickness as indicated, but not less than 5/8".

2.2 ACCESSORIES

- A. Fasteners and Adhesives: Bolts, Studs, Nuts, Nails, Wood Screws, Spikes, Adhesives, Anchors, and similar items shall meet federal specifications, of type, size, material, and finish as best suited for the condition of use, and as required to sufficiently draw and rigidly secure members for which they are used. Fasteners shall be galvanized or corrosion resistant at exterior locations and at all treated wood applications.
- B. Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
- C. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.
- D. Structural Framing Connectors: Hot dipped galvanized steel, sized to suit framing conditions.

2.3 WOOD TREATMENT

- A. Preservative Treatment; shall be pressure impregnated in accordance with manufacturer's recommendations, and the maximum moisture content after treatment shall be 19 % for lumber, and 15% for plywood. Preservative treatment shall be used on dimensional lumber, grounds, nailers, bucks, and shims when material is in contact with flashing, waterproofing, masonry, concrete, or the ground. One of the following equal manufacturers and products may be used:
 - a. Koppers Company, "Wolmanized" (www.koppers.com)
 - b. Osmose Wood Preserving Company Inc., "K-33" (www.osmose.com)
 - c. Hoover Treated Wood Products Inc., "Dixie CCA" (www.frtw.com)
 - d. Additional approved equal products shall be considered
- B. Fire retardant: AWWPA Treatment C20, Interior Type, chemically treated and pressure impregnated; capable of providing a maximum flame spread/smoke development rating as required by code. One of the following equal manufacturers and products may be used:
 - a. Hoover Treatment Wood Products, Inc, "Pyro-Guard"
 - b. Additional approved equal products shall be considered

PART 3 EXECUTION

3.1 FRAMING AND BLOCKING

- A. Set structural members and blocking level and plumb, in correct position.
- B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Place horizontal members, crown side up.
- D. Construct load bearing framing members full length without splices.
- E. Provide blocking, grounds, furring strips, and nailers of adequate size and strength for the intended purpose for all trim, shelving, countertop supports, reception window countertops, building directories, hardware items, etc. Minimum 16 gauge sheet metal straps or metal studs may be substituted for wood blocking.

3.2 SHEATHING

- A. Secure wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered.
- B. Install sheathing to two span continuous.
- C. Install telephone and electrical panel back boards with plywood sheathing material where required. Size the back board by 1'-0" beyond size of electrical panel.

3.3 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment and fire retardant treatment in accordance with manufacturer's instructions.
- B. Brush apply one coat of preservative treatment on wood in contact with cementitious materials, roofing and related metal flashings. Treat site-sawn cuts.
- C. Allow preservative to dry prior to erecting members.
- D. Install fire retardant treatment in accordance with conditions and limitations listed in NER 457 as issued by the National Evaluation Services, Inc.
 - a. Do not install in areas where it is exposed to precipitation, direct wetting or regular condensation.

3.4 TOLERANCES

- A. Framing Members: 1/4" from true position, maximum.
- B. Surface Flatness of Floor: 1/4" inch in 10'-0" maximum, and 1/2" in 30'-0" maximum.

END 06100

Rough Carpentry
06100-4

DIVISION 6 - WOOD AND PLASTICS
Section 06200 - Finish Carpentry

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior finish carpentry materials include handrails, base, casing, and miscellaneous trim, paneling, and other finish carpentry as indicated on the Drawings.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data:
 - a. Provide data on fire retardant treatment of materials and application instructions.
 - b. Provide instructions for attachment hardware, and finish hardware.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
- C. Samples:
 - a. Submit two samples of finish plywood, 1'-0" x 1'-0" illustrating wood grain and specified finish.
 - b. Submit two samples of solid wood trim, 1'-0" x 1'-0" illustrating wood grain and specified finish.

1.3 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Architectural Woodwork Quality Standards, Custom Grade, WIC Manual of Millwork, Custom Grade.
- B. Fabricator: Company specializing in fabricating the products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

- A. Interior Finish Carpentry Items: Wood shall have a maximum moisture content of 12% for exterior finish lumber, and 9% for interior trim.
- B. Interior finished carpentry; shall be plain slice cherry in First and Second Grades (verify with Landmark) using rectangular cross sections, unless noted otherwise on Drawings.
- C. Solid Wood Valances; shall be plain slice cherry in First and Second Grades (verify with

- Landmark) and shall be provided at the heads of sliding and bi-fold doors to conceal hardware tracks.
- D. Wood handrails shall be plain slice cherry in First and Second Grades (verify with Landmark).
 - E. Wood veneer panels shall be manufacturer's stock hardwood veneer plywood paneling complying with HPVA HP-1. (verify with Landmark).
 - a. Face Veneer Species and Cut, "Plain Sliced Cherry"
 - b. Veneer matching; Selected for similar color and grain.
 - c. Veneer Thickness; 1/42" minimum thickness before sanding.
 - d. MDF Backing: ANSI A208.2, made with binder containing no ureaformaldehyde resin.
 - e. Paneling adhesive: shall comply with veneer manufacturer's written recommendations. Use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - f. One of the following approved manufacturers and products may be used:
 - i. Crown Veneer Corporation
 - ii. Dooge Veneers Inc.
 - iii. Additional approved equal manufacturers and products will be considered._

2.2 FASTENERS

- A. Fasteners: Of size, type, material, and finish to best suit application, and as required to sufficiently draw and rigidly secure members for which they are used.
 - a. Fasteners shall meet federal specifications.
 - b. Fasteners shall be galvanized or corrosion resistant at exterior locations and at tall treated wood applications.
 - c. Concealed Joint Fasteners: Threaded steel.
 - d. Concealed fasteners shall be used wherever possible.
- B. Fasteners for veneered wood panels shall be fully concealed of size, type and finish to best suit application and as required to sufficiently draw and rigidly secure members for which they are used.

2.3 ACCESSORIES

- A. Primer: Alkyd primer sealer type.
- B. Wood Filler: Solvent base, tinted to match surface finish color.
- C. Coat Hook: shall be stainless steel, satin finish, installed at height to meet ADA requirements. One of the following approved manufacturers and products may be used:
 - a. American Specialties, “7345”
 - b. Bobrick, “B-76727”
 - c. Additional approved equal manufacturers and products will be considered.
- D. Closet pole hardware shall include the following:
 - a. Closet Pole shall be Baer Supply Company “DS1751CHR”, or approved equal
 - b. Closet Support shall be Baer Supply Company “DS504SCH”, or approved equal
- E. Coat Rack shall be Emco Custom Coat Rack, “R1” in stain finish, or approved equal.

2.4 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.
- C. Shop prepare and identify components grain matching during site erection.
- D. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.2 INSTALLATION

- A. Use only sound, thoroughly seasoned materials of the longest practical lengths and sizes to minimize joints.
- B. Trim and Moldings:
 - a. Install in single, unjoined lengths for openings and for runs of less than 10'-0". For

longer runs, use only one piece which is less than 10'-0" in any straight run.

- b. Stagger joints in adjacent members.
- c. Cope moldings at returns and miter at corners.
- C. Set and secure materials and components in place, plumb and level. Joints shall be tight fitting and mitered. Place uniform joints providing for thermal and building movement. Blind nail where possible.
- D. Carefully scribe work abutting other components, with maximum gaps of 1/32". Do not use additional overlay trim to conceal larger gaps.
- E. Install paneling with full bed contact adhesive applied to substrate.
- F. Install hardware in accordance with manufacturer's instructions, and Shop Drawings
- G. Concealed fasteners shall be used wherever possible. All nail holes shall be countersunk and puttied flush.
- H. Shelving Installation: Supports shall be spaced not more than 3'-0" on center and within 1'-0" of end of shelf. Bottom support shall be mounted 1'-0" above the floor, unless indicated otherwise on the Drawings.
- I. Provide hardwood valances at the heads of sliding and bi-fold doors to conceal hardware tracks and match adjacent door finish.

3.3 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth. Filler shall match the finish if wood is sealed or stained
- B. Site Finishing: Refer to Section 09900 - Painting.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.4 ERECTION TOLERANCES

- A. Maximum Variation from True Position: 1/16".
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32".

END 06200

DIVISION 6 - WOOD AND PLASTICS
Section 06400 – Plastic Laminate Casework

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Modular cabinets, countertops, writing ledges, wall caps, exposed shelving, other modular casework items and accessories as indicated on the Drawings.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- B. Product Data: Provide data for hardware accessories.

1.3 QUALITY ASSURANCE

- A. Perform work in accordance with AWI and WIC Custom quality.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wood material; shall have a maximum moisture content of twelve percent (12%) for exterior finish lumber, and nine percent (9%) for interior trim.
- B. Cabinets, countertops, wall caps and shelving shall receive high pressure plastic laminate finish.
 - a. Cabinets, countertops, wall caps and shelving shall receive Wilsonart plastic laminate in one of Landmark's six standard color schemes which include two plastic laminate colors per scheme.
 - b. One color will be used for the exposed to view shelving, base cabinets, wall cabinets, aprons and pencil drawings. A second color will be used for countertops, backsplashes writing ledges and wall caps.

2.2 FINISHES

- A. PLAM-1: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Khaki Brown, D50-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- B. PLAM-2: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Amber Cherry, 7919-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- C. PLAM-3: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Mission Adobe, 4849-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- D. PLAM-4: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Natural Tigris, 4669-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- E. PLAM-5: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Amazon, D478-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- F. PLAM-6: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Monticello Maple, 7925-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- G. PLAM-7: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high

- pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Mission Stone, 4853-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- H. PLAM-8: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Green Soapstone, 4885-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- I. PLAM-9: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Natural Almond, D30-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- J. PLAM-10: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Shaker Cherry, 7935-07 (7935-7).
 - b. Additional approved equal manufacturers and products shall be considered.
- K. PLAM-11: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Desert Zephyr, 4841-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- L. PLAM-12: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Antique Copper LS, D494-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- M. PLAM-13: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:

- a. Wilsonart Pebble, D337-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- N. PLAM-14: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Blond Echo, 7939-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- O. PLAM-15: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Evening Tigris, 4674-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- P. PLAM-16: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Sable Soapstone, 4883-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- Q. PLAM-17: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart Beige, 1530-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- R. PLAM-18: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonart River Cherry, 7937-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- S. PLAM-19: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
- a. Wilsonrt Mission Shadow, 4852-38.

- b. Additional approved equal manufacturers and products shall be considered.
- T. PLAM-20: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Antique Bronze LS, D493-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- U. PLAM-21: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Fashion Gray, D381-60.
 - b. Additional approved equal manufacturers and products shall be considered.
- V. PLAM-22: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonrt Mission Smoke, 4847-38.
 - b. Additional approved equal manufacturers and products shall be considered.
- I. PLAM-23: Plastic laminate shall be minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Pearl Soapstone, 4886-38.
 - b. Additional approved equal manufacturers and products shall be considered.

2.2 CABINETS

- A. Cabinet construction shall be flush overlay design, and shall be constructed of industrial grade particle board meeting ANSI A 208.1 Grade 1-M-2, in accordance with AWI, Section 400 requirements for laminated-clad cabinets.
 - a. Vertical exposed surfaces, except for wall cabinet bottoms and tops, shall receive a minimum .028" (nominal 1/32") vertical surfacing grade high pressure decorative laminate conforming to NEMA LD3-2000.
 - b. Wall cabinet bottoms shall receive a white melamine laminated panel.
 - c. Interior and other semi-exposed surfaces except edges, shall receive cabinet liner, or polyester or melamine laminated panels. Backs and drawer bottoms may be painted.

- d. Edges of laminated components shall receive a plastic “T”, self edge or PVC edge matching the decorative laminate face.
- e. Unrestrained cabinet components such as adjustable shelves shall receive the same thickness of finish material on both faces. Door insides shall receive white cabinet liner.
- f. Thickness and materials for laminate clad cabinet components shall be as follows:

<u>Cabinet Component</u>	<u>Material</u>	<u>Minimum Thickness of Materials</u>
i. Body Members	Panels	3/4”
ii. Rails	Solid Lumber or Panel	3/4”
iii. Shelves	Panels Medium Density Particleboard or Fiberboard	3/4” for spans up to 36” 1” for spans up to 48”
iv. Backs	Hardboard	3/16”
v. Drawer Sides, Backs and Subfronts	Solid Lumber or Particleboard Panel	3/4” Lumber 3/4” (50# density or more)
vi. Drawer Bottoms	Hardboard	1/4”
vii. Drawer Fronts	Panels	3/4”
viii. Doors	Panels	3/4”

2.3 COUNTERTOPS AND WRITING LEDGES

- A. Countertops and writing ledges shall be constructed of plywood, 3/4” minimum thickness.
- B. Horizontal exposed surfaces, edges and back splashes shall receive .042” plastic laminate conforming to NEMA Standards and ANSI A 161.2-1979 “Performance Standards for Fabricated High-Pressure Decorative Laminate Countertops”.
- C. All post formed tops shall receive backer sheets.
- D. All edge veneer tops shall receive backer sheet or white melamine.
- E. 3-1/2” high aprons shall be provided beneath countertops at knee spaces adjacent to pencil drawers or typewriter drops.
- F. Writing ledges and reception window tops shall be 1’-0” wide and be centered on the wall or within the opening, unless otherwise shown on Drawings. All exposed edges shall be laminated.

- G. Countertop joints shall not occur at sink openings.

2.4 WALL CAPS AND SHELVING

- A. Shelving exposed to view shall be 3/4" particle board finished with minimum .028" (nominal 1/32") laminate on faces and plastic "T", self edge or PVC edge matching the decorative laminate face on all edges. Depth shall be 1'-4" unless shown otherwise on Drawings.
- B. Storage Room shelving and other shelving not exposed to view shall be 3/4" white Melamine or Kortron coated, minimum nine (9) mil thickness with finished edges. Shelving shall be 16" deep, unless otherwise shown on Drawings, mounted on adjustable brackets attached to wall mounted standards.
- C. Support hardware shall be clear anodized manufactured by Knape-Vogt. Hardware shall be furnished by the cabinet manufacturer.
 - a. Standards: No. 80 – 24", 36", 48", 72" and in lengths as shown on Drawings.
 - b. Brackets: No. 180 – 16" coordinated with shelf depth.
 - c. Shelving supports shall be spaced not more than 2' on center and within 6" of the end of shelving. Bottom supports shall be mounted 1' above floor unless otherwise required.

2.5 FASTENERS

- A. Fasteners: Of size, type, material, and finish to best suit application, and as required to sufficiently draw and rigidly secure members for which they are used.
 - a. Fasteners shall meet federal specifications.
 - b. Fasteners shall be galvanized or corrosion resistant at exterior locations and at tall treated wood applications.
 - c. Concealed Joint Fasteners: Threaded steel.
 - d. Concealed fasteners shall be used wherever possible.
- B. Adhesive: Type recommended by AWI, WIC, and laminate manufacturer to suit application.

2.6 ACCESSORIES

- A. Wire Access Grommets; shall be Doug Mockett and Co. "TG-2", or approved equal, 2" hole, 1 7/8" clear opening, black color.
- B. Keyboard Tray; shall be Articulating Arm, with height adjustment lever lock. One of the following equal manufacturers and products may be used:
 - a. Allsteel, "Lift-to-Adjust Platform" (www.allsteeloffice.com)

- b. Additional approved equal products shall be considered
- C. Chart Holders; shall be 12" x 10" x 2" deep clear acrylic with two screw fasteners with toggle bolts - no blocking. Mount at 54" from floor to top of chart holder. One of the following equal manufacturers and products may be used:
 - a. Medical Arts Press, "No. 32270 ", (www.medicalartspress.com)
 - b. Additional approved equal products shall be considered.
- D. File Drawer Hardware; All file drawers to have appropriate file hanger hardware to accommodate both letter and legal size folders.
- E. Inside Countertop Support Brackets; shall be A&M Hardware, Inc.- (888)-647-0200 (www.AandMHardware.com)
 - a. "Work Station Brackets" 18" x 24" and 8" x 12" "Shelf Support Brackets" with 3" x 3" – 45 degree notch for wire management. Finish to be white powder coat. Support brackets to be installed @ 32" O.C. maximum under countertops at inside locations or where indicated on construction drawings.
- F. Outside or Exposed Countertop Support Brackets; shall be manufactured by casework provider. Plastic laminate finish shall match casework finish. Plastic laminate support brackets to be installed where exposed condition occurs or indicated on construction drawings. See construction drawings for more information.

2.7 HARDWARE

- A. Pulls shall be 5/16" diameter equal to Amerock No. PUL-4-26D in dull chrome finish.
- B. Hinges shall be 3 dimensional independent adjustable, fully concealed self-closing 170 degree swing European hinges equal to Blum No. 71T6580. (www.blumhinge.com)
- C. Drawer slides shall be self-closing epoxy coated bottom mount with captive nylon rollers and one hundred (100) pound static load test rating equal to Blum 230M Series. (www.blumhinge.com)
- D. File drawer slides shall be full extension epoxy coated bottom mount with double captive nylon rollers and one hundred (100) pound static load test rating equal to Blum 430E series. (www.blumhinge.com)
- E. Shelf supports shall be double pin design with a depressible tab to prevent shelf from tilting, 256, as manufactured by Knape-Vogt mounted on silver finish 255 or 233 standards (4 per cabinet) (www.knapeandvogt.com) or removable nylon molded shelf clips (4 per cabinet) inserted in pre-drilled holes at the side of the cabinet equal to Handy Button.
- F. Air vents shall be 3" aluminum louvers as manufactured by Midget Louvers, "Regular Series" (www.midgetlouver.com)
- G. Cam locks shall be satin chrome assembled pin tumbler as manufactured by National Cabinet

Lock.

- H. Gang locks shall be “Front Mount System 100” as manufactured by CompX – (864)297-6655 (www.compx.com).

2.8 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- C. Door and Drawer Fronts: 3/4” thick; flush style.
- D. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- E. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate counter butt joints minimum 2’-0” from sink cut-outs.
- F. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
- G. Mechanically fasten back splash to countertops with steel brackets at 1’-4” on center.
- H. Provide cutouts for plumbing fixtures, inserts, and fittings. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.2 INSTALLATION

- A. Install hardware in accordance with manufacturer’s recommendations.
- B. Set and secure casework in place; rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32”. Do not use additional overlay trim for this purpose.

- a. Care shall be taken to install joints properly with hairline seams. Where contractor is unable to achieve a hairline seam, provide sealant in joints in color to match plastic laminate surface
- F. Secure cabinet and counter base to floor using appropriate angles and anchorages.

3.3 ADJUSTING

- A. Adjust moving or operating parts to function smoothly and correctly.
- B. Doors shall be aligned top and bottom and shall be adjusted to operate properly.

3.4 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures in accordance with cabinet and plastic laminate manufacture's recommendations.

END 06400

DIVISION 6 - WOOD AND PLASTICS
Section 06415 – Stone Countertops

PART 1 GENERAL

1.1 SECTION

- A. This Section includes stone countertops and vertical face where indicated.

1.2 SUBMITTALS

- A. Product Data: For each variety of stone.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work.
- C. Samples: For each stone type indicated.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Source Limitations for Stone: Obtain each variety of stone from a single quarry with resources to provide materials of consistent quality in appearance and physical properties.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify dimension of construction to receive stone countertops by field measurements before fabrication.

PART 2 PRODUCTS

2.1 GRANITE

- A. Granite: As specified in Finish Materials List.

2.2 ADHESIVES, GROUT, SEALANTS, AND STONE ACCESSORIES

- A. Water-Cleanable Epoxy Adhesive: ANSI A118.3
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Bonsal, W.R. Company
 - b. Bonstone Materials Corporation
 - c. C-Cure
 - d. Custom Building Products
 - e. Laticrete International, Inc.
 - f. MAPEI Corp.
 - g. Summitville Tiles, Inc.
- B. Water-Cleanable Epoxy Grout: ANSI A118.3, chemical-resistant, water cleanable, tile-setting and grouting epoxy to match granite in color as determined by the Architect.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Boiardi Products Corporation
 - b. W.R. Bonsal Company
 - c. Bostik Findley Inc.
 - d. C-Cure
 - e. Custom Building Products
 - f. Laticrete International, Inc.
 - g. MAPEI Corp.
 - h. Summitville Tiles, Inc.
 - i. TEC Incorporated; H.B. Fuller Company.
- C. Sealant for Countertops: Manufacturer's standard sealant of characteristics indicated below, that comply with applicable requirements in Division 7 Section "Joint Sealants" and will not stain the stone it is applied to.
1. Single-component, neutral curing silicone sealant.
 2. Color: Clear
- D. Stone Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik Findley Inc.
 - b. Custom Building Products
 - c. Hillyard, Inc.
 - d. HMK Stone Care System
 - e. Miracle Sealants Company

- f. Stone Care International Inc.
- g. Summitville Tiles, Inc.

2.3 STONE FABRICATION

- A. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
- B. Fabricate stone countertops in sizes and shapes required to comply with requirements indicated, including details on Drawings and Shop Drawings.
 - 1. Dress joints straight and at right angle to face, unless otherwise indicated.
 - 2. Fabricate molded edges with machines having abrasive shaping wheels made to reverse contour of edge profile to produce uniform shape throughout entire length of edge.
 - 3. Finish exposed faces of stone to comply with requirements indicated. Provide matching finish on exposed edges of countertops, splashes, and cutouts.
- C. Provide ½” Durock board as substrate to granite on counter and vertical surfaces at Reception Desk.
- D. Comply with recommendations in MIA’s “Dimension Stone – Design Manual.”
- E. Nominal Thickness: Provide thickness indicated, but not less than 1-1/4 inches. Gage backs to provide units of identical thickness.
- F. Splashes: Provide 1 ¼” thick backsplashes and end splashes, unless otherwise indicated.
- G. Joints: Fabricate countertops in sections for joining in field, with joints at locations indicated and as follows:
 - 1. Grouted Joints: 1/16 inch (1.5mm) in width.
 - 2. Sealant-Filled Joints: 1/16 inch (1.5 mm) in width.
- H. Cutouts and Holes:
 - 1. Counter-Mounted Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
 - 2. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

PART 3 EXECUTION

3.1 INSTALLATION OF COUNTERTOPS

- A. General: Install countertops over plywood subtops with full spread of water-cleanable epoxy adhesive.
- B. Set stone to comply with requirements indicated on Drawings and Shop Drawings. Shim and adjust stone to locations indicated, with uniform joints of widths indicated and with edges and faces aligned according to established relationships.
- C. Space joints with 1/16-inch (1.5-mm) gap for filling with grout sealant. Use temporary shims to ensure uniform spacing.
 - 1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- D. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Use power saws with diamond blades to cut stone. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
- E. Install backsplash and end splash by adhering to wall with water-cleanable epoxy adhesive. Leave 1/16-inch (1.5mm) gap between countertop and splash for filling with sealant. Use temporary shims to ensure uniform spacing.
- F. Grout joints to comply with ANSI A108.10. Remove temporary shims before grouting. Tool grout uniformly and smoothly with plastic tool.
- G. Apply sealant to gaps specified for filling with sealant; comply with Division 7 Section "Joint Sealants." Remove temporary shims before applying sealant.

3.2 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
- B. Clean stone countertops not less than six days after completion of installation, using clean water and soft rags. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers or other materials or methods that could damage stone.
- C. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions.

END 06415

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
Section 07260 - Vapor Retarder & Air In Filtration Barriers

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Vapor retarder, air infiltration barrier, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data indicating material characteristics, and performance criteria.

1.3 SUBMITTAL FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate preparation and installation recommendations.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for requirements of application.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

- A. Polyethylene vapor retarder; shall be minimum six (6) mils thick, and shall be installed on the warm air side of exterior wall areas receiving unfaced fiberglass insulation, secured in place with adhesives. One of the following approved manufacturers may be used:
 - a. Fortifiber Corporation, 19342 Lake Montcalm Road, Howard City, MI 49329
Phone: (800) 442-2587
 - b. Griffolyn, Reef Industries, Inc., P.O. Box 750250, Houston, TX 77275
Phone: (713) 507-4200.
 - c. Additional approved equal products shall be considered
- B. Fireproof Polyethylene vapor retarder; shall be used above ceiling in exposed plenum return spaces, and shall be 3 ply, 8 mil fire retardent vapor barrier, and shall be installed on warm side of exterior wall areas receiving unfaced fiberglass insulation, secure in place with adhesives. Vapor barrier shall be Reef Industries, "Griffolyn Type TX-120 FR" or approved equal.

2.2 SEALANTS

- A. Sealant: As recommended by air infiltration barrier and vapor barrier manufacturer
 - a. Primer: Recommended by manufacturer to suit application.

- B. Sealing Tape and Fasteners: Tape, screws and nails as recommended by air infiltration barrier and vapor barrier manufacturer.
- C. Cleaner: Non-corrosive type; recommended by manufacturer; compatible with adjacent materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

- A. Do not install vapor retarder or air infiltration barrier until items penetrating either of these are in place.
- B. Remove loose or foreign matter which might impair adhesion or damage vapor retarder and air infiltration barrier.
- C. Clean and prime substrate surfaces to receive adhesive and sealants in accordance with manufacturers' instructions.

3.3 INSTALLATION – VAPOR BARRIER

- A. Install materials in accordance with manufacturer's instructions.
- B. Vapor Retarder For Stud Framed Walls: Secure sheet barrier to stud faces with adhesive. Lap edges over stud faces, lap ends onto adjacent construction; caulk ends to ensure complete seal.

3.5 PROTECTION OF FINISHED WORK

- A. Do not permit adjacent work to damage work of this section.

END 07260.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
Section 07600 – Flashing and Sheet Metal

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flashing and sheet metal including, flashing, counter flashing, and all required accessories, and fasteners for a complete and operational flashing system.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- B. Product Data: Provide data on sheet metal material and prefabricated components.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Warranty: Submit manufacturer's 20 year material warranty. Ensure forms have been completed in Owner's name and registered with manufacturer.
- B. Warranty: Submit contractor's two year workmanship warranty.

1.4 QUALITY ASSURANCE

- A. Sheet Metal Flashings: Conform to the following criteria of SMACNA "Architectural Sheet Metal Manual."
- B. Roofing Manufacturer Warranty: Conform to the roofing manufacturers recommendations in support of securing the roofing system warranty.

1.5 WARRANTY

- A. Sheet Metal Contractor shall issue a guarantee of workmanship to correct defective work occurring within a two year period after Date of Substantial Completion. Defective work includes, but is not limited to, failure of water-tightness or seals, and oil canning due to rupture, restricted expansion/contraction, or faulty workmanship.
- B. Material warranty from the sheet metal manufacturer for a period of 20 years against deterioration of color, chalking and film integrity.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

- A. Metal flashing: Metal Flashings shall be of .040" aluminum for up to 8" wide and .050" for greater than 8" wide, and .063" for greater than 12" wide, pre-finished aluminum, color as selected by Landmark from manufacturers standard colors. All fasteners locations shall have pre-drilled holes.

2.2 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal with soft neoprene washers.
- B. Protective Backing Paint: FS TT-C-494, Bituminous.
- C. Sealant: Polyurethane type. One of the following equal manufacturers and products may be used:
 - a. Tremco: Dymeric
 - b. Sonnoborn: NPI.
 - c. Additional approved equal products shall be considered.
- D. Plastic Cement: ASTM D4586, Type I.
- E. 1/8" x 1" Stainless Steel bar stock.
- F. Reglets: Surface mounted type when out of view, and recessed type when in view, galvanized steel; face and ends covered with plastic tape

2.3 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate continuous cleats of same materials as coping minimum 3 inches wide, interlocking with sheet a min. of 1/2".
 - a. Drill pilot holes at 4" o.c. for attachment to wood.
 - b. Drill pilot holes at 6" o.c. for attachment to masonry or concrete.
- C. All fastener locations shall have predrilled pilot holes:
 - a. Nails - 1/4" diameter @ 4" o.c.
 - b. Screw Fasteners - 5/16" diameter @ 1'-0" o.c.
- D. Form pieces in longest possible lengths.
- E. Hem exposed edges on underside 1/2"; miter and seam corners.

- F. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- G. Fabricate vertical faces with bottom edge formed outward 1/2" and hemmed to form drip.
- H. Seal metal joints.

2.4 FACTORY FINISHING

- A. Finish: Primed and finished on one side with a fluoropolymer coating 1.0 +/- 0.1 mil total dry film thickness. A wash coat, having dry film thickness of 0.3 / 0.4 mil shall be applied to the unfinished side of the sheet metal. Re-finishing at the welds shall be with Valspar Air Dry Kynar Spray, or approved equal system. Color as selected by Landmark from manufacturers standard colors.
- B. All metal materials to be delivered to the site with protective, strippable plastic film.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.
- C. Verify that surfaces to receive sheet metal are smooth and clean will not impinge upon the integrity of the sheet metal.
- D. Verify that all wood blocking to receive sheet metal is properly installed, anchored without warps and covered with EPDM.
- E. Do not start sheet metal work until conditions relevant to sheet metal work are acceptable. Commencing of work will indicate acceptance of condition.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- C. Lay out joints to be symmetrical about the building corners. May require more than one run be cut down to attain symmetry.
- D. Paint dissimilar metals with bituminous paint to form a complete barrier.

3.3 INSTALLATION

- A. Secure flashings in place using concealed fasteners.

- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles. Install work watertight, without buckles, warps, fastening stresses or distortion. Allow for expansion and contraction.
- D. Extreme care should be taken by Sheet Metal Contractor not to puncture the roofing membrane with metal. All metal trimmings shall be placed in an on-roof-top container.
- E. Verify height of aluminum roof base flashing termination bar allows for installation of counterflashing and sealant below weep holes and throughwall flashing.
- F. Continuous Cleats:
 - a. Set in water cut-off mastic supplied by the Roofing Contractor or sealant.
 - b. Secure to the surface with nail fasteners through 1/4" predrilled pilot holes at 4" on center.

3.4 INSTALLATION - COUNTERFLASHING

- A. Overlap the base flashing a minimum of 3".
- B. Install continuous butyl caulk tape to vertical portion of the counterflashing.
- C. Secure to the masonry with 1 1/4" x 3/16" tapcons with climaseal corrosion resistive coating and neoprene washers at 1'-0" on center through 5/16" pre-drilled pilot holes. Cover with sealant.
- D. Lap counterflashing pieces 3", provide bead of sealant and between pieces.
- E. Cover fastener heads with sealant after the Architect's approval.
- F. Fill sealant reservoir with sealant to shed water.
- G. Counterflashing Corner Pieces: Install pieces per requirements listed above.

3.5 INSTALLATION – END WALL FLASHING

- A. Set in full bed of water cut-off mastic.
- B. Secure with screw fasteners through 1/4" pre-drilled pilot holes as indicated on drawings.
- C. Coordinate installation with roofing contractor.
- D. Have the roofing contractor flash in vertical flange of end wall flashing.
- E. Install coping, or standing seam siding, over the end wall flashing by either:
 - a. Securing to vertical flange of end wall flashing and pulling coping over the wood blocking of the roof edge.

- b. Securing to the continuous clip and laying against mansard.

3.6 INSTALLATION – THRU WALL FLASHING

- A. Coordinate with masonry contractor.
- B. Set backer plates.
- C. Set thru wall flashing atop masonry over EPDM flashing, lap 2" and set lopped pieces in sealant. Set in sealant over backer plate.
- D. Notch and remove portion of receiver so that horizontal flanges lap 3" and receivers butt. Set lap in sealant and pop rivet. Cover lap with ice and water shield.
- E. At corners, lap horizontal flanges in sealant and pop rivet.
- F. Following installation of tile coping piece, install counterflashing up into receiver.

3.7 CLEANING

- A. Leave material clean and free of stains.
- B. Remove all sheet metal debris from roof top daily.
- C. Remove all sheet metal debris from site daily.

END 07600

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
Section 07810 - Sprayed-On Fireproofing

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sprayed on fireproofing at metal deck, structural steel, and joists as indicated on the Drawings.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data indicating product characteristics, performance criteria, limitations of use, and rating requirements.

1.3 SUBMITTALS FOR INFORMATION

- A. Test Reports: Reports from reputable independent testing agencies for proposed products, indicating the following:
 - a. Bond Strength of Fireproofing: ASTM E736.
 - b. Bond Impact: ASTM E760.
 - c. Compressive Strength: ASTM E761.
 - d. Fire test reports of fireproofing application to substrate materials, including primers, similar to project conditions, conducted in conformance to ASTM E84 and ASTM E119.
- B. Manufacturer's Installation Instructions: Indicate special procedures, and conditions requiring special attention.
- C. Certificate of Compliance: Provide for fireproofing materials to authority having jurisdiction, if required, indicating approval for use on this project

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section, with minimum five continuous years of documented experience as an approved application of one of the specified.
- B. Owner Testing
 - a. Owner shall employ and pay for a qualified testing and inspection laboratory to perform fireproofing testing and on-site inspection services during the Work. Written reports of the inspections, observations, and testing shall be provided to Landmark within 48 hours of test and inspections. Landmark shall notify by phone or fax the same day if any failing test is determined.

- b. Contractor shall provide free access to the Work. Contractor shall notify the Owner's independent testing laboratory of scheduled Work. If Contractor fails to notify the Owner's independent testing laboratory, and as a result, no tests are taken, Contractor shall bear the cost of verifying that the in place fireproofing meets the requirements of these specifications.
- c. Testing of completed fireproofing shall take place in successive stages in each bay, 10,000 square feet of floor area, or total floor area, whichever produces the greatest number of test areas. Fireproofing of next area shall not proceed until test results for previous completed fireproofing show compliance with requirements.
- d. The testing agency shall randomly select one structural member of each type (primary beam, secondary beam, joist, truss, steel deck and column). And test fireproofing as follows:
 - i. For cohesion and adhesion per ASTM E736.
 - ii. For thickness per ASTM E605.
 - iii. Lower flanges and webs of beams, column webs, column flanges, and floor deck for density per ASTM E605 or Appendix A "Alternate Method for Density Determination" of AWCI Technical Manual 12-A.
- e. If testing paid for by the Owner discovers fire proofing not in compliance with requirements, all retesting to verify compliance and all additional random testing in the area of non-compliance to determine extent of noncompliance, shall be paid for by the Contractor.

1.5 REGULATORY REQUIREMENTS

- A. Fire Rated Assemblies: Provide fire rated assembly rating conforming to the applicable building code. Refer to drawings for rating and assembly requirements.
- B. Provide sprayed on fireproofing which is identical in materials and construction to the system tested.
- C. Acceptable testing agencies include Underwriters Laboratories, Inc. and Warnock Hersey International, Inc.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Sprayed on Fireproofing shall not be installed when ambient or substrate temperatures are forty (40) degrees F. and falling unless temporary protection and heat is provided.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Isolatek International, "Blaze-Shield" (www.isolatek.com)
- B. Grace Construction Products, "Monokote" (www.na.graceconstruction.com)
- C. A/D Fire Protection Systems, "A/D Type 5GP" (www.adfire.com)

- D. Additional approved equal U.L. assembly products shall be considered.

2.2 FIREPROOFING

- A. Low Density Cementitious Type: Factory mixed, cementitious material blended for uniform texture with vermiculite or lightweight synthetic aggregate, and conforming to the following requirements:
 - a. Bond Strength: ASTM E736, 200 psi when set and dry.
 - b. Bond Impact: ASTM E760, no cracking, flaking or delamination.
 - c. Dry Density: ASTM E605, minimum average density of 14 lb/cu ft, with minimum individual density of any test sample of 13 lb/cu ft.
 - d. Compressive Strength: ASTM E761, minimum 7.0 psi.
 - e. Surface Burning Characteristics: Maximum flame spread of 0 and maximum smoke developed of 0, per ASTM E84.
- B. Materials shall be asbestos-free. One of the following equal manufacturers and products may be used:

2.3 ACCESSORIES

- A. Primer and Adhesive Coating: If required, of type recommended by fireproofing manufacturer.
- B. Water: Clean, potable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive fireproofing.
- B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
- C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.
- D. Verify that voids and cracks in substrate have been filled. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

3.2 PREPARATION

- A. Do not allow roof traffic during installation of roof fireproofing and drying period.
- B. Do not install on roof deck until roofing Work is completed.

- C. Perform tests as recommended by fireproofing manufacturer in situations where adhesion of fireproofing to substrate is in question.
- D. Remove incompatible materials that could affect bond by scraping, brushing, scrubbing, or sandblasting.
- E. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.
- F. Apply fireproofing manufacturer's recommended bonding agent on primed steel.
- G. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.
- H. Close off and seal duct work in areas where fireproofing is being applied.

3.3 APPLICATION

- A. Install metal lath over structural members as indicated or as required by the fire rated assembly Design Numbers.
- B. Apply fireproofing and accessories in accordance with manufacturer's instructions.
- C. Apply fireproofing in sufficient thickness and density to achieve required ratings, with as many passes as necessary to cover with monolithic blanket of uniform density and texture.
- D. In areas where fireproofing has been disturbed because of installation of other building systems or other additional construction, fireproofing shall be reapplied in accordance with manufacturer's instructions. Patch the areas as required to conform with requirements of the system UL design.

3.4 CLEANING

- A. Remove excess material, overspray, droppings, and debris.
- B. Remove fireproofing from materials and surfaces not required to be fireproofed.

3.5 SCHEDULE

- A. Spray on Fireproofing shall be provided to the following criteria, unless noted otherwise on the Drawings:
 - a. 1, 2 and 3 Hour Rated Floor Assemblies (where concrete floor thickness is greater than 3 1/2" for 1-hour, 4 1/2" for 2-hour and 5 1/4" for 3-hour); shall comply with UL Design No. D916 or approved equal.
 - b. 1, 2 and 3 Hour Rated Floor Assemblies (where concrete floor thickness is less than required above); shall comply with UL Design No. D743 or approved equal.
 - b. 1 and 2 Hour Rated Roof Assemblies; shall comply with UL Design No. P701 or

approved equal.

- c. 1, 2 and 3 Hour Rated “W” Columns; shall comply with UL Design No. X772 or approved equal.
- d. 1, 2, and 3 Hour Rated Tube Steel Columns; shall comply with UL Design No. X771 or approved equal.

END 07810

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
Section 07840 – Penetration Seals

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Firestopping, fire safing insulation, smoke seal, and accessories to maintain the designated fire resistance rating of the floor, wall, or roof assembly.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on product characteristics, performance, limitation criteria, and test results.
- B. System Description: Provide a complete UL approved system identification and description for each application of penetration seals.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in performing the work of this section with minimum three (3) years documented experience.
- B. Firestopping material shall be asbestos free.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code, and UL listing for fire resistance ratings and surface burning characteristics.
- B. Fire Rated Assemblies: Refer to the Drawings for rating and assembly requirements. Provide penetration seals of fire rating equal to that of the construction within the actual depth and thickness of the construction.
- C. Provide penetration seal which is identical in materials and construction to the system tested. Acceptable testing agencies include Underwriters Laboratories, Inc. and Warnock Hersey International, Inc.
- D. Firestopping material; shall comply with applicable building codes and shall have been tested in accordance with UL 1479 or ASTM E 814.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when temperature of substrate material and ambient air is below 40 degrees F. Maintain a minimum of 40 degrees F. temperature of substrate for 24 hours before, during and 24 hours after application of firestopping materials.
- B. Provide ventilation in areas to receive solvent cured materials, and as recommended by manufacturer.

PART 2 FIRESTOPPING PRODUCTS

2.1 MANUFACTURERS

- A. Dow Corning
- B. 3M
- C. Bio Fireshield
- D. Additional approved equal manufacturers shall be considered.

2.2 PRODUCTS

A. <u>Metal pipe or conduits through round opening:</u>	<u>Dow Corning</u>	<u>3M</u>	<u>Bio Fireshield</u>
	C-BJ-1001	C-AJ-1001	W-L-0001
	C-BJ-1005	C-AJ-1007	W-L-1012
	C-AJ-1009	C-AJ-1013	C-AJ-1031
	C-AJ-1010	C-AJ-1014	C-AJ-0033
	C-AJ-1012	C-AJ-1015	
B. <u>Insulated metal pipe through round opening:</u>	<u>Dow Corning</u>	<u>3M</u>	<u>Bio Fireshield</u>
		C-AJ-5001	C-AJ-5006
		F-A-1002	
C. <u>Metal pipes or conduit through large opening:</u>	<u>Dow Corning</u>	<u>3M</u>	<u>Bio Fireshield</u>
	W-J-1003	C-AJ-1006	W-L-0001
	C-BJ-1002	F-A-1001	W-L-1012
			C-AJ-1031
			C-AJ-0033
D. <u>Busway through rectangular opening:</u>	<u>Dow Corning</u>	<u>3M</u>	<u>Bio Fireshield</u>
		F-A-6001	
		C-AJ-6001	
E. <u>Cables through opening:</u>	<u>Dow Corning</u>	<u>3M</u>	<u>Bio Fireshield</u>
	W-J-3003	C-AJ-3001	C-BJ-3004
	W-J-3004	C-AJ-3002	C-BJ-3005
	C-BJ-3001	F-B-3002	C-BJ-3006
	C-AJ-3007		

	C-AJ-8002		W-L-3011 C-AJ-3024
F. <u>Metal pipe or conduit and cables through large opening:</u>	<u>Dow Corning</u> C-BJ-1003 C-BJ-1004 C-AJ-8003 C-AJ-8004	<u>3M</u> C-BJ-1015	<u>Bio</u> <u>Fireshield</u> C-BJ-3004 C-BJ-3005
G. <u>Cable tray:</u>	<u>Dow Corning</u> C-BJ-4001 C-BJ-4002 C-BJ-4003 C-BJ-4004 C-BJ-4005	<u>3M</u> C-BJ-4011 C-AJ-4003 F-B-4002	<u>Bio</u> <u>Fireshield</u> W-K-4002 W-K-4003 C-BJ-4006 C-BJ-4007 C-AJ-4010
H. <u>Glass pipe through opening:</u>	<u>Dow Corning</u>	<u>3M</u> C-AJ-2006	<u>Bio</u> <u>Fireshield</u> C-AJ-0033
I. <u>Blank opening:</u>	<u>Dow Corning</u> W-J-0001 C-BJ-0001 C-BJ-0002 C-AJ-0034	<u>3M</u> C-AJ-0001 C-AJ-0002 C-AJ-0004	<u>Bio</u> <u>Fireshield</u> C-AJ-0033
J. <u>Non-metallic (plastic) pipe through opening:</u>	<u>Dow Corning</u>	<u>3M</u> C-AJ-2001	<u>Bio</u> <u>Fireshield</u> Device per UL XHCR
K. <u>Metal pipe or conduit through gypsum board wall:</u>	<u>Dow Corning</u>	<u>3M</u> W-L-0001 C-AJ-1031	<u>Bio</u> <u>Fireshield</u>
L. <u>Non-metallic (plastic) pipe through gypsum board wall:</u>	<u>Dow Corning</u>	<u>3M</u> W-L-2004	<u>Bio</u> <u>Fireshield</u> Device per UL XHCR
M. <u>Cables through gypsum board:</u>	<u>Dow Corning</u>	<u>3M</u> W-L-3001	<u>Bio</u> <u>Fireshield</u> W-L-3011
N. <u>Insulated metal pipe:</u>	<u>Dow Corning</u>	<u>3M</u>	<u>Bio</u>

2.3 FIRESTOPPING AND SMOKE SEAL AT FLOOR LINE

- A. Steel Stud Firestopping at Floor Lines
 - a. Safing system and components to be part of an overall system to be compliant with Omega Point Laboratories CEJ 121 P, or approved equal system. The following basic materials shall be used (refer to Omega Point System for complete listing / description of materials and installation).
 - b. Metal stud wall safing insulation shall be 4", 4pcf nom. thick mineral wool batt insulation faced on one side aluminum foil/scrim vapor retarder held in place with impaling pins and secured to wall framing with 4" wide pressure sensitive foil tape.
 - c. Forming (horizontal) safing Insulation: Nom. 4pcf density mineral wool batt insulation.
 - d. Thermal attachment clips required to hold forming material in place.
 - e. Fire and Smoke Seal at slab edges shall be an elastomeric spray.
- B. Firestopping at top of interior wall steel stud partitions at intersection to metal deck.
 - a. Safing system and components shall be part of an overall system that is compliant with Underwriters Laboratories as indicated on the Drawings, or approved equal system. The following basic materials shall be used (refer to Omega Point System for complete listing and description of materials and installation):
 - b. Mineral wool safing and fire rated sealant as indicated on the Drawings.
- C. Mineral Wool; One of the following equal manufacturers may be used:
 - a. Thermafiber
 - b. 3M Companies
 - c. Additional approved equal manufacturers will be considered.
- D. Fire and Smoke Seals; One of the following equal manufacturers may be used:
 - a. Specified Technologies, "SpecSeal AS200 Elastomeric Spray"
 - b. 3M Companies

- c. Additional approved equal manufacturers will be considered.

2.4 ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces.
- B. Dam Material: Mineral fiberboard, of fiber matting.
- C. Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which may affect bond.
- C. Install damming materials to arrest liquid material leakage.

3.3 INSTALLATION

- A. Install material at walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- B. Holes and voids made by penetrations in non-rated assemblies shall be sealed to ensure an effective smoke barrier.
- C. Where floor openings are 4" or more in width and subject to traffic or loading, install firestopping materials capable of supporting the same load as the floor.
- D. Apply primer and materials in accordance with manufacturer's instructions.
- E. Apply firestopping material in sufficient thickness to achieve rating.
- F. Compress fibered material to achieve a density of 40 percent of its uncompressed density.

3.4 INSTALLATION – STEEL STUD FIRESTOPPING AT FLOOR LINES

- A. Install in accordance with manufacturer's instructions and in strict accordance with designated Testing Laboratory requirements.
- B. Clean substrates of substances harmful to insulation, including removing projections capable of puncturing foil face or of interfering with insulation attachment.
- C. Cut and fit tightly around obstructions and fill voids with insulation.
- D. Set foil (vapor retarder) faced units with vapor retarder on warm / interior side of construction, unless otherwise indicated on the Drawings.
- E. Tape joints and ruptures in foil face (vapor retarder) and seal each continuous area of insulation to surrounding construction with tape to ensure air tight installation.
- F. Spray apply fire and smoke seals to cover the exposed surfaces of the mineral wool installed in the perimeter joint in accordance with manufacturer's recommendations and Testing Laboratory requirements.

3.5 INSTALLATION – TOP OF STEEL STUD TO METAL DECK

- A. Install in accordance with manufacturer's instructions and in strict accordance with designated Testing Laboratory requirements.
- B. Clean substrates of substances harmful to insulation, including removing projections capable of puncturing foil face or of interfering with insulation attachment.
- C. Cut and fit tightly around obstructions and fill voids with insulation.
- D. Apply fire and smoke seals to cover the exposed surfaces of the mineral wool installed and overlaps the gypsum board a minimum of 1" on both sides and in accordance with manufacturer's recommendations and Testing Laboratory requirements.

3.6 CLEANING

- A. Clean adjacent surfaces of firestopping materials.
- B. Remove damming materials after curing if made of other than fire resistant materials.

3.7 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

B. Protect Work from damage on surfaces subject to traffic.

END 07840

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
Section 07900 – Caulk and Sealants

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Caulk, sealant, and backer rods for joints as indicated on the Drawings.
 - a. Seal around exterior frames and sills of all windows, storefront, curtain wall, doors, louvers, other openings in exterior walls, control and expansion joints and changes in material in exterior wall construction to prevent leakage and other locations indicated on the Drawings.
 - b. Caulk around interior frames, plumbing fixtures, casework, and other locations indicated on the Drawings.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- B. Manufacturers standard color charts for color selections.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

1.4 SUBMITTAL FOR PROJECT CLOSEOUT

- A. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. All caulk and sealant shall be supplied by the same manufacturer, except for joints greater than 1" and for fire resistive joints.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.7 WARRANTY

- A. Defective Work occurring within a 10 year period after Date of Substantial Completion shall be corrected immediately.

- B. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, and / or watertight seal, and exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 EXTERIOR SEALANTS

- A. For exterior and interior expansion and control joints, shall be silicone weatherproof sealant, one-part neutral-cure architectural sealant to form a durable, flexible silicone rubber seal. An equal product from one of the following manufacturers may be used:
 - a. Dow Corning, “790” (www.dow.com)
 - b. Tremco Inc., “Spectrem 1” (www.tremcosealants.com)
 - c. GE “Silpruf”.
 - d. Additional approved equal products shall be considered.

- B. For expansion joints between buildings greater than 1”:
 - a. GE “Silpruf”.
 - b. Additional approved equal products shall be considered.

- C. Fire resistance Joints:
 - a. Tremco Dymeric.
 - b. Additional approved equal products shall be considered.

2.2 INTERIOR CAULKS

- A. For hidden and exposed metal to metal joints and metal to gypsum board joints, shall be silicone weatherproof sealant, one-part neutral-cure architectural sealant to form a durable, flexible silicone rubber seal. An equal product from one of the following manufacturers may be used:
 - a. Dow Corning, “791” (www.dowcorning.com)
 - b. Tremco Inc., “Spectrem 4-TS” (www.tremcosealants.com)
 - c. GE “Silpruf”.
 - d. Additional approved equal products shall be considered.

- B. For exposed metal to metal or metal to gypsum board joints:

- a. Dow Corning, “891” (www.dowcorning.com)
 - b. Additional approved equal products shall be considered.
- C. For wet sanitary areas, joints shall be silicone weatherproof sealant, one-part neutral-cure architectural sealant to form a durable, flexible silicone rubber seal. An equal product from one of the following manufacturers may be used:
- a. Tremco Inc, “Tremsil 200” (www.tremcosealants.com)
 - b. Additional approved equal products shall be considered.
- C. For expansion and control joints:
- a. Dow Corning, “790”. (www.dowcorning.com)
 - b. Tremco Inc., “Spectrem 4-TS” (www.tremcosealants.com)
 - c. GE, “Silpruf”
 - d. Additional approved equal products shall be considered.

2.3 ACCESSORIES

- A. Primer: Required, non-staining type, as recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Fillers; shall be compatible with sealant used. For elastomeric sealants, backer rod shall be extruded closed-cell polyethylene foam or polyethylene jacketed polyurethane foam, non-bleeding, non-staining, oversized to 30 – 50%. An equal product from one of the following manufacturers may be used:
 - a. Contech Sonneborn Building Products, “Sonofoam backer rod”
 - b. Dow Corning, “Ethafaom”
 - c. W.R. Meadows Inc, “Backer Rod”
 - d. Additional approved equal products shall be considered.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces and joint openings are ready to receive work.

3.2 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

- A. Perform installation in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer [, except where specific dimensions are indicated].
- D. Prime joint surfaces to come in contact with sealants.
- E. Install bond breaker where joint backing is not used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints concave, unless noted otherwise on the Drawings.
- I. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/4" below adjoining surface.
- J. Compression Gaskets: Avoid joints except at ends, corners, and intersections; seal all joints with adhesive; install with face 1/4" below adjoining surface.

3.4 CLEANING

- A. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

- A. Protect caulks and sealants until cured

END 07900.

DIVISION 8 - DOORS AND WINDOWS
Section 08100 – Hollow Metal Doors and Frames

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Work Includes: Stock hollow metal doors, frames, and accessories.
- B. Refer to specification section 13090 – X-Ray Radiation Protection for lead lined hollow metal frame requirements.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Indicate door configurations, location of cut-outs for hardware reinforcement.
- B. Shop Drawings: Indicate door and frame elevations, internal reinforcement, and cut-outs for glazing.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special installation instructions.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of Steel Door Institute, “Recommended Specifications: Standard Steel Doors and Frames” (SDI-100) and ANSI A117.1
- B. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.5 REGULATORY REQUIREMENTS

- A. Fire Rated Door, Frame, and Panel Construction: Conform to ASTM E152, NFPA 252, and UL 10B.
- B. Provide doors and frames which are identical in materials and construction to the systems tested.
- C. Installed Door, Frame, and Panel Assembly: Conform to NFPA 80, and UL fire rated label for fire rated class as scheduled on the Drawings.

PART 2 PRODUCTS

2.1 DOORS

- A. Exterior Hollow Metal Doors:

- a. G-60 galvanized, flush type 1 3/4" thick 18 gauge stretcher leveled seamless hollow metal.
 - b. Foam filled in place with insulation to provide a minimum R value of 11.1.
 - c. Doors shall be mortised and reinforced to receive hardware.
 - d. A weatherproof closure channel shall be provided at tops of exterior doors.
 - e. Openings for lights shall be provided when shown on Drawings.
- B. Interior Hollow Metal Doors:
- a. Type SDI, Type II, unless noted otherwise on the Drawings
 - b. Flush style, beveled front edge for proper swing.
 - c. Doors shall be mortised and reinforced to receive hardware.
 - d. Openings for lights shall be provided when shown on Drawings.

2.2 FRAMES

- A. Exterior Hollow Metal Door Frames or Door Frames in Masonry; shall be welded, cold-rolled 16 gauge, factory G-60 galvanized hollow metal with strike boxes.
- B. Shell and Core Interior Hollow Metal Door Frames; shall be drywall wrap-around type, welded, cold-rolled, factory primed, 18 gauge for openings to 4'-0"; 16 gauge for openings greater than 4'-0".
 - a. Shell and Core interior door frames include areas such as stair, public toilet rooms, mechanical / electric rooms, doors to public corridors and doors to lobbies.
- C. Borrowed-Light Frames; shall be drywall wrap-around type, welded, cold-rolled, factory primed, 18 gauge.
- D. Special Procedure Room Hollow Metal Door Frames; such as surgical rooms, cardiac catheterization laboratories, CT Scan, and other rooms which require a sterile environment, shall be drywall wrap-around type, welded, cold-rolled, factory primed, 14 gauge with hospital stops at 45 degrees and capped.
- E. All Other Interior Hollow Metal Door Frames; shall be drywall wrap-around type, knock down, cold-rolled, factory primed, 18 gauge for openings to 4'-0"; 16 gauge for openings greater than 4'-0".

2.3 ACCESSORIES

- A. Glass: In accordance with Section 08800 – Glass and Glazing

- B. Primer: Zinc chromate type.

2.2 FABRICATION

- A. Fabricate doors with hardware reinforcement welded in place.
- B. Finish Hardware Preparation:
 - a. All frames shall be die cut and reinforced for 4-1/2" x 4-1/2" template hinges.
 - b. Hinge reinforcement shall be seven (7) gauge, 1-1/2" wide x 6" longer than the hinge secured by not less than six (6) spot welds.
 - c. Frames shall be reinforced for closers and all necessary hardware and shall be punched for 4-7/8" strike plate.
 - d. Frames shall be drilled for 3 GJ-64 or Hager 307D silencers on single swing frames and 2 GJ_64 or Hager 307D silencers on heads of double swing frames, except for frames to receive weatherstripping.
 - e. Frames shall be furnished with strike boxes.
- C. Attach fire rated label to each fire rated door unit.
- D. Configure exterior doors with special profile to receive recessed weatherstripping.
- E. Fabricate hollow metal units to be rigid, neat in appearance and free from defects, accurately formed to the required sizes and profiles.
- F. Wherever possible, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be factory assembled before shipment, to assure proper assembly at the project site.
- G. Weld and dress all welded joints on exposed surfaces flush and smooth, to be invisible when prime painted.
- H. Use of metallic filler to conceal manufacturing defects is not acceptable.
- I. Bevel front edge of all doors for proper swing.

2.3 FINISH

- A. Clean, treat, and prime paint all surfaces of fabricated hollow metal units in shop, including galvanized surfaces, whether concealed or exposed in the finished work. Cleaning process shall be compatible with prime paint and other requirements of products listed in Section 09900 Painting.
- B. Remove mill scale, rust, oil, grease, dirt and other foreign materials before application of the shop coat of paint.

- C. Apply shop coat of baked-on prime paint of even consistency to provide a uniform finished surface ready to receive field applied paint.
- D. Paint: In accordance with Section 09900 – Painting.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that opening sizes and tolerances are acceptable.

3.2 PREPARATION

- A. Coordinate frame installation with size, location, and installation of service utilities.
- B. Coordinate the work with door opening construction, door frame, and door hardware installation.
- C. Coordinate the throat dimension of the frame with the partition thickness.
- D. Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

3.3 INSTALLATION

- A. Install doors and frames in accordance with SDI-100 and DHI.
- B. Coordinate installation of glass and glazing.
- C. Doors shall be installed with uniform 3/32" jamb and head margins and 1/8" sill clearance above the threshold.
- D. Provide three anchors per jamb, at hinge and strike levels, in masonry construction.
- F. Touch-up factory primer.

3.4 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16" measured with straight edge, corner to corner.
- B. Do not erect members which are observed to be warped, bowed, deformed, or otherwise damaged or defaced to such extent as to impair strength or appearance. Remove and replace members which have been damaged in the process of erection.

3.5 ADJUSTING

- A. Adjust door for smooth and balanced door movement.

END 08100.

Hollow Metal Doors and Frames
08100-5

DIVISION 8 - DOORS AND WINDOWS
Section 08220 – Plastic Laminate Doors

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flush plastic laminate doors and accessories.
- B. Refer to specification section 13090 – X-Ray Radiation Protection for lead lined plastic laminate door requirements.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- B. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, blocking for hardware, plastic laminate selection, and cutouts for glazing.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special installation instructions.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Quality Standard Section 1300, Custom Grade.
- B. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. All interior plastic laminate doors shall be supplied by the same manufacturer.

1.5 SUBMITTAL FOR PROJECT CLOSEOUT

- A. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 REGULATORY REQUIREMENTS

- A. Fire Rated Door, Frame, and Panel Construction: Conform to ASTM E152, NFPA 252, UL 10B, and AWI type "FD" construction.
- B. Provide doors and frames which are identical in materials and construction to the systems tested.
- C. Installed Door, Frame, and Panel Assembly: Conform to NFPA 80, and UL fire rated label for fire rated class as scheduled on the Drawings.

1.7 WARRANTY

- A. Manufacturers standard warranty for not less than 2 year, guaranteeing the material and lamination of veneer, warping beyond installation tolerances, defective material and telegraphing core construction.
- B. Manufacturer's standard written lifetime warranty.

PART 2 PRODUCTS

2.1 PLASTIC LAMINATE DOORS

- A. General:
 - a. All flush door facing shall be high pressure decorative laminate general purpose Grade 50 (GP50 - .050" thick) complying with NEMA Standard LD-3.
 - b. Interior Doors shall be factory finished in color selected by Landmark. A maximum of two plastic laminate colors shall be used throughout the building.
- B. Interior hinged plastic laminate doors; shall be
 - a. Flush, 1-3/4" particleboard core meeting or exceeding ANSI A208.1 for I-LD-2 door core and conforming to AWI type "PC" construction.
 - b. Stiles and rails shall be bonded to the core. Provide UL labeling for 20, 45, and 60 minute fire rated applications.
- C. Interior sliding, bi-fold and pocket doors;
 - a. Flush, 1-3/8" hollow core.

2.2 FINISHES

- A. PLD-1: One of the following approved manufacturers and products may be used:
 - a. Formica, "7759-43 Select Cherry (Artisan Finish)"
 - b. Additional approved equal manufacturers and products shall be considered.

***** OR *****

- A. PLD-1: One of the following approved manufacturers and products may be used:
 - a. Formica, "7012-58 Amber Maple (Matte Finish)"
 - b. Additional approved equal manufacturers and products shall be considered.

2.3 ACCESSORIES

- A. Glazing Stops: Plastic Laminate of same color and pattern as door facing, with metal clips for rated doors, rolled steel channel shape with mitered corners, prepared for countersink style tamper proof screws.
- B. Glass: In accordance with Section 08800 – Glass and Glazing

2.4 FABRICATION

- A. Provide lock blocks at lock edge, and top of door for closer for hardware reinforcement.
- B. Vertical Exposed Edge of Stiles: Of same plastic laminate color as facing.
- C. Fit door edge trim to edge of stiles after applying veneer facing.
- D. Bond edge banding to cores.
- E. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through bolted hardware.
- F. Factory fit doors for frame opening dimensions identified on Shop Drawings.
- G. Provide edge clearances in accordance with AWI 1600.
- H. Smoke tight and fire rated doors shall be fabricated to close the opening with the minimum clearance necessary for operation and as required to meet the code requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that opening sizes and tolerances are acceptable.
- B. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 PREPARATION

- A. Coordinate the work with door opening construction, door frame and door hardware installation.

3.3 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions.
- B. Install fire rated doors in accordance with AWI Quality Standard, and NFPA and building code requirements.
- C. Door Clearances:
 - a. Allow 1/8" clearance between door and frame at head and jambs, and undercut 1/2" from

concrete floors to provide clearance of resilient tile, carpet, and ceramic floor finish.

- b. Extent of undercut at other floor finishes shall be verified with Contractor.
 - c. Trim non-rated door width by cutting equally on both jamb edges.
 - d. Trim door height by cutting bottom edges to a maximum of 3/4". Trim fire door height at bottom edge only, in accordance with fire rating requirements.
- D. Machine cut for hardware and lights.
- E. Coordinate installation of glass and glazing.

3.4 INSTALLATION TOLERANCES

- A. Conform to AWI requirements for fit and clearance tolerances.
- B. Conform to AWI Section 1300 requirements for maximum diagonal distortion.

3.5 ADJUSTING

- A. Adjust door for smooth, balanced, and snug fit door movement without rattling.
- B. Adjust closer for full closure.

END 08220.

DIVISION 8 - DOORS AND WINDOWS
Section 08310 - Access Doors

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal access doors, fasteners and accessories for a complete installation.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- B. Shop Drawings: Indicate exact position of all access door units.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate installation requirements, and rough-in dimensions.

1.4 REGULATORY REQUIREMENTS

- A. Provide fire rated access doors in walls and ceilings which carry a fire rating, as indicated on the Drawings.
- B. Fire Rated Access Door Construction: Conform to ASTM E152, NFPA 252, and UL 10B.
- C. Provide doors and frames which are identical in materials and construction to the systems tested.
- D. Installed Door, Frame, and Panel Assembly: Conform to NFPA 80, and UL fire rated label for fire rated class as scheduled on the Drawings.

PART 2 PRODUCTS

2.1 WALL AND CEILING UNITS

- A. Wall and Ceiling Metal Access Doors: Shall be provided in all drywall ceilings, soffits or partitions that do not require a fire rating, and shall be one of the following approved manufacturers and products:
 - a. Milcor Incorporated, "DW" (www.milcorinc.com)
 - b. J.L. Industries, "Model WB" (www.jlindustries.com)
 - c. Karp Associates, "Model KDW" (www.karpinc.com)
 - d. Additional equal manufacturers and products may be considered.

- B. Fire Rated Wall and Ceiling Metal Access Doors: Shall be provided in fire-rated ceilings, soffits, or partitions, and shall bear a UL rating conforming to the rating requirements of the wall or Soffit as indicated on the Drawings. One of the following approved manufacturers and products may be used:
 - a. Milcor Incorporated, “UFR” (www.milcorinc.com)
 - b. J.L. Industries, “Model FDWB” (www.jlindustries.com)
 - c. Karp Associates, “KRP 450FR” (www.karpinc.com)
 - d. Additional equal manufacturers and products may be considered

2.2 FABRICATION

- A. Access Doors; shall be flush panel style, with concealed hinges, factor primed painted with cylinder locks all keyed alike.
 - a. Access doors shall be provided with a flange that will accept drywall compound for a concealed frame appearance.
 - b. Provide two keys per lock.
- B. Weld, fill, and grind joints to ensure flush and square unit.
- C. Hardware:
 - a. Hinge: 175 degree steel piano hinge with removable pin concealed constant force closure spring type.
 - b. Lock: Screw driver slot for quarter turn cam lock

2.3 FINISHES

- A. Base Metal Protection: Prime coat units with baked on primer.
- B. Finish: In accordance with Section 09900 – Paint.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings for door and frame are correctly sized and located.

3.2 PREPARATION

- A. Coordinate the work with all other work requiring access doors.

- B. Access doors shall be provided in gypsum board, plaster, and EIFS ceilings, soffits, and partitions where required to access fire or smoke dampers, plumbing shutoffs, equipment, and cleanouts. Refer to the Drawings for finish materials.

3.3 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in opening. Secure rigidly in place.
- C. Position the unit to provide convenient access to concealed work requiring access.

END 08310.

DIVISION 8 - DOORS AND WINDOWS
Section 08410 - Aluminum Entrances and Storefronts

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum entrances and storefronts including all components, anchors, fasteners, for a complete and operational system.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide component dimension, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AAMA SFM-1 and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Conform to requirements of ANSI A117.1.
- C. Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience.
- D. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State where the Project is located.
- E. Entrances and storefronts shall be supplied by the same manufacturer.
- F. Entrances and storefronts shall be supplied by the same manufacturer supplying aluminum windows.
- G. Coordinate installation to comply with fire rated safing and smoke seals requirements at floor line as required in section 07840 – Penetration Seals.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install sealants when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.6 WARRANTY

- A. Warranty: Include coverage for complete system for any failure to meet specified requirements.
- B. Workmanship: Defective Work occurring within a five (5) year period after date of Substantial Completion shall be corrected immediately.
- C. Provide manufacturer written three (3) year guarantee for aluminum entrance doors.
- D. Provide manufacture written two (2) year guarantee for aluminum entrance and storefront system material. Include coverage for product failure and finish warranty.
- E. Provide manufacturer written ten (10) year guarantee for insulated glass.
- F. Glazing: Written five (5) year joint guarantee from the glazing contractor and general contractor for aluminum entrance and storefront including glazing water-tightness.

PART 2 PRODUCTS

2.1 STOREFRONT SYSTEM

- A. Aluminum Storefront with Un-Insulated Glazing: shall be installed on the interior of the building, and shall consist of 1 3/4" x 4 1/2" frame members and shall accept 1/4" or 3/8" infills. Front glass applications, with glazing on the inside of the building. One of the following approved manufacturers and products may be used:
 - a. Kawneer Company, Inc., "TrifabVG 450" (www.kawneer.com)
 - b. YKK, "45FI" (www.ykkap.com)
 - c. EFCO Corporation, "System 401" (www.efcocorp.com)
 - d. Vistawall Architectural Products, "FG 2000" (www.modu-line.com)
 - e. Additional equal manufacturers and products may be considered
- B. Aluminum Storefront with Insulated Glazing: Units shall be thermally broken for insulated glass, and shall consist of 2" x 4 1/2" frame members and shall accept up to

1 1/8" infills. Framing members shall provide for flush neoprene glazing on both sides for the head, sill and jamb. Front glass application, with glazing on the inside of the building. One of the following approved manufacturers and products may be used:

- a. Kawneer Company, Inc., "Trifab VG 451 T" (www.kawneer.com)
 - b. YKK, "45TU" (www.ykkap.com)
 - c. EFCO Corporation, "System 403 T" (www.efcocorp.com)
 - d. Vistawall Architectural Products, "FG 3000" (www.modu-line.com)
 - e. Additional equal manufacturers and products may be considered
- C. Aluminum Storefront with Insulated Butt Glazing: Units shall be thermally broken for insulated glass, and shall consist of 2" x 4 1/2" frame members and shall accept 1 1/8" infills. Framing members shall provide for flush neoprene glazing on both sides for the head, sill and jamb. Front butt glazing application for all interior mullions, and butt glass application with glazing on the outside of the building, for head, sill and jamb. One of the following approved manufacturers and products may be used:
- a. Kawneer Company, Inc., "Trifab VG 451 T" (www.kawneer.com)
 - b. YKK, "40D Narrow Stile" (www.ykkap.com)
 - c. EFCO Corporation, "System 403 T" (www.efcocorp.com)
 - d. Vistawall Architectural Products, "FG 3000" (www.modu-line.com)
 - e. Additional equal manufacturers and products may be considered
- D Storefront Trim and Flashing Components:
- a. Aluminum Trim Accessories; for head and jamb closures and mullion covers shall be .062" thick and shall be factory pre-finished to match the storefront frame color.
 - b. Aluminum Flashing; shall be factory pre-finished and match the storefront frame color unless otherwise shown on Drawings and shall be .050" thick for widths up to 4", .062" thick for widths greater than 4" but less than 7" and .090" thick for widths greater than 7".

2.2 ENTRANCE DOORS

- A. Aluminum Entrance Doors: shall be narrow stile entrance with 2 1/8" vertical stile, 2 1/4" top rail and 3 7/8" bottom rail. Door operation shall be single acting. Door

frame widths and depths shall match adjacent store front. Door infill shall be 1” for the exterior building doors, and 1/4” for the interior building doors. Door shall meet ADA accessibility requirements. One of the following approved manufacturers and products may be used:

- a. Kawneer Company, Inc., “190 Narrow Stile” (www.kawneer.com)
 - b. YKK, “20D Narrow Stile (www.ykkap.com)
 - c. EFCO Corporation, “System D200 Narrow Stile” (www.efcocorp.com)
 - d. Vistawall Architectural Products, “212 Narrow Style” (www.modu-line.com)
 - e. Additional equal manufacturers and products may be considered
- B. Aluminum Entrance Door Components: The following component specification is based on the Kawneer Swing Entrance Door, “190 Narrow Stile”, to establish style and quality. All components shall be supplied by a single manufacturer. Equal components from one of the other approved manufacturers listed above shall be acceptable.
- a. Weather-stripping; shall be provided on exterior building doors and shall be equal to Sealair and EPDM blade gasket sweeps.
 - b. Sill Sweep Strips: Retracting resilient seal type, of neoprene compound.
 - c. Thresholds; shall be aluminum mill finished, complying with applicable handicapped codes. One of the following approved manufacturers and products may be used
 - i. Reese #S245A
 - ii. National Guard Products #325
 - iii. Hager #431SAL
 - d. Exterior Building Door hardware:
 - i. Kawneer top and bottom offset pivots.
 - ii. Kawneer Dor-o-matic 1990 concealed rod panic devices with cylinder.
 - iii. Kawneer Style CO-9 Pull.
 - iv. Kawneer Concealed SAM II (single acting manual) with Husky PN 37-624 overhead closers with adjustable closing and latching speeds and adjustable operating resistance (8 ½ pound pull maximum). Closers shall be provided without hold open feature.
 - e. Interior Vestibule Building Door Hardware:

- i. Kawneer top and bottom offset pivots.
- ii. Kawneer Style CO-9 Pull with CP-II Push Bar.
- iii. Kawneer Concealed SAM II with Husky PN 37-621 overhead closers with adjustable closing and latching speeds and adjustable operating resistance (5-1/2 pound pull maximum). Closers shall be provided without hold open feature.

2.3 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08800 – Glass and Glazing
- B. Glass shall be replaceable from the interior.
- C. Spandrel glass shall be replaceable from the exterior.
- D. Provide flush neoprene gaskets on both sides.

2.4 SEALANT MATERIALS

- A. Sealant Material: As specified in Section 07900 – Caulk and Sealants.

2.5 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Reinforce interior horizontal head rail to receive blind track brackets and attachments.
- F. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.
- G. Reinforce framing members for imposed loads.
- H. Permit internal drainage weep holes and channels to migrate moisture to exterior.
- I. Provide internal drainage of glazing spaces to exterior through weep holes

2.6 FINISHES

- A. Aluminum Finish and Color; shall be factory applied polyvinylidene fluoride based

with resin to contain a minimum of 50 percent PVDF at interior and 70 percent PVDF at exterior, color as selected by Landmark.

- B. Shop and Touch-Up Primer for Steel Components: SSPC Paint 25 red oxide.
- C. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with treated wood, cementitious, or dissimilar materials.
- D. Aluminum finish and color shall match aluminum windows, unless noted otherwise.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

3.2 PREPARATION

- A. Coordinate the work of the power door operator at the main entry doors including exterior door and interior vestibule door.

3.3 INSTALLATION

- A. Install water tight in accordance with ASTM E331, E1105, and E283.
- B. Install wall system in accordance with manufacturer's instructions and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- C. Hidden dissimilar metals and cementitious materials shall be separated with bituminous paint, gaskets, nonabsorptive plastic or elastomeric tape or a suitable sealant to prevent corrosion.
- D. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- E. Provide alignment attachments and shims to permanently fasten system to building structure.
- F. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, and aligning with adjacent work.
- G. Provide thermal isolation where components penetrate or disrupt building insulation.

- H. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- I. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- J. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- K. Set thresholds in bed of mastic and secure.
- L. Install hardware using templates provided. Refer to Section 08700 – Finished Hardware for installation requirements.
- M. Install glass and infill panels in accordance with Section 08800 – Glass and Glazing,
- N. Install perimeter sealant, backing materials, and installation criteria in accordance with Section 07900 – Caulk and Sealants.

3.4 INSTALLATION – TRIM AND FLASHING COMPONENTS

- A. Install aluminum trim accessories for head and jamb closures and mullion covers where indicated on the Drawings.
- B. Install aluminum flashing where indicated on the Drawings.
 - a. Turn up ends and edges; seal to adjacent work to form water tight dam to stop water penetration.
 - b. Install sill flashing behind system weep holes to ensure weeps drain water to exterior of building.
- C. Install perimeter sealant, backing materials, and follow installation criteria in accordance with Section 07900 – Caulk and Sealants.

3.5 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/16” every 3’-0”, non-cumulative or 1/8” per 12’-0”, 1/4” in any total length, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/16”.
- C. Maximum out-of-plane offset of framing at corners shall not exceed 1/32”.

3.6 ADJUSTING AND CLEANING

- A. Adjust operating hardware for smooth operation.

- B. Remove protective material from pre-finished aluminum surfaces.
- C. Exposed fasteners and unfinished metal shall be touched up to match the frame finish color.
- D. Clean all surfaces in accordance with manufactures recommendations.
 - a. If manufacturer does not provide recommendations, wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths.
 - b. Take care to remove dirt from corners.
 - c. Wipe surfaces clean.
- E. Remove excess sealant by method acceptable to sealant manufacturer.

3.7 PROTECTION OF FINISHED WORK

- A. Protect finished Work from damage.

END 08410

DIVISION 8 - DOORS AND WINDOWS
Section 08520 - Aluminum Windows

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum fixed windows including all components, anchors, fasteners, for a complete and operational system.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide component dimensions; describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AAMA 101, AAMA SFM-1 and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Conform to requirements of ANSI A117.1.
- C. Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience.
- D. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State where the Project is located.
- E. Windows shall be supplied by the same manufacturer supplying entrances and storefronts.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install sealants when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.6 WARRANTY

- A. Warranty: Include coverage to repair or replace as required, the complete system for any failure to meet specified requirements.

- B. Workmanship: Defective Work occurring within a five (5) year period after date of Substantial Completion shall be corrected immediately.
- C. Provide manufacture written two (2) year guarantee for aluminum entrance and storefront system material. Include coverage for product failure and finish warranty.
- D. Provide manufacturer written ten (10) year guarantee for insulated glass.
- E. Glazing: Written five (5) year joint guarantee from the glazing contractor and general contractor for aluminum entrance and storefront including glazing water-tightness.
- F. Defective Work occurring within five (5) year period after date of Substantial Completion shall be corrected immediately.

PART 2 PRODUCTS

2.1 WINDOW SYSTEM

- A. Aluminum Windows: Window units shall be thermally broken for insulating glass. Framing members shall provide for flush neoprene glazing on both sides. Strip window installations (window openings greater than 10'-0") shall utilize "Screw-Spline" with head receptors and individual or short length installations (window openings less than 10'-0") shall utilize "Shear-Block". Front glass applications, with glazing on the inside of the building. One of the following approved manufacturers and products may be used:
 - a. Kawneer Company, Inc., "Trifab VG 451 T" (www.kawneer.com)
 - b. YKK, "YES 45 TU" (www.ykkap.com)
 - c. EFCO Corporation, "System 403 T" (www.efcocorp.com)
 - e. Vistawall Architectural Products, "FG 3000" (www.modu-line.com)
 - e. Additional equal manufacturers and products may be considered
- B. Aluminum Windows with Insulated Butt Glazing: Window units shall be thermally broken for insulating glass. Framing members shall provide for flush neoprene glazing on both sides for the head, sill and jamb. Strip window installations (window openings greater than 10'-0") shall utilize "Screw-Spline" with head receptors and individual or short length installations (window openings less than 10'-0") shall utilize "Shear-Block". Butt glazing application for all interior mullions, with glazing on the outside of the building. One of the following approved manufacturers and products may be used:
 - a. Kawneer Company, Inc., "Trifab VG 451 T" (www.kawneer.com)
 - b. EFCO Corporation, "System 403 T" (www.efcocorp.com)
 - c. Vistawall Architectural Products, "FG 3000" (www.modu-line.com)

- d. Additional equal manufacturers and products may be considered.
- C. Window Trim and Flashing Components:
- a. Aluminum Trim Accessories; for head and jamb closures and mullion covers shall be .062" thick and shall be factory pre-finished to match the window frame color.
 - b. Aluminum Flashing; shall be factory pre-finished and match the window frame color unless otherwise shown on Drawings and shall be .050" thick for widths up to 4", .062" thick for widths greater than 4" but less than 7" and .090" thick for widths greater than 7".

2.2 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08800 – Glass and Glazing
- B. Glass shall be replaceable from the interior.
- C. Spandrel glass shall be replaceable from the exterior.
- D. Provide flush neoprene gaskets on both sides.

2.3 SEALANT MATERIALS

- A. Sealant Material: As specified in Section 07900 – Caulk and Sealants.

2.4 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Reinforce interior horizontal head rail to receive blind track brackets and attachments.
- F. Reinforce framing members for imposed loads.
- G. Provide internal reinforcement in mullions to maintain rigidity.
- H. Permit internal drainage weep holes and channels to migrate moisture to exterior.
- I. Provide internal drainage of glazing spaces to exterior through weep holes

2.5 FINISHES

- A. Aluminum Finish and Color; shall be factory applied polyvinylidene fluoride based with

resin to contain a minimum of 50 percent PVDF at interior and 70 percent PVDF at exterior, color as selected by Landmark.

- B. Shop and Touch-Up Primer for Steel Components: SSPC Paint 25 red oxide.
- C. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with treated wood, cementitious, or dissimilar materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

3.2 INSTALLATION

- A. Install the wall system in accordance with manufacturer's instructions and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Hidden dissimilar metals and cementitious materials shall be separated with bituminous paint, gaskets, nonabsorptive plastic or elastomeric tape or a suitable sealant to prevent corrosion.
- D. Provide alignment attachments and shims to permanently fasten system to building structure.
- E. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- F. Provide thermal isolation where components penetrate or disrupt building insulation.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install glass and infill panels in accordance with Section 08800 – Glass and Glazing,

3.3 INSTALLATION – TRIM AND FLASHING COMPONENTS

- A. Install aluminum trim accessories for head and jamb closures and mullion covers where indicated on the Drawings.
- B. Install aluminum flashing where indicated on the Drawings.
 - a. Turn up ends and edges; seal to adjacent work to form water tight dam to stop water

penetration.

- b. Install sill flashing behind system weep holes to ensure weeps drain water to exterior of building.
- C. Install perimeter sealant, backing materials, and follow installation criteria in accordance with Section 07900 – Caulk and Sealants.

3.4 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/16” every 3’-0”, non-cumulative or 1/16” per 10’-0”, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32”.

3.5 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Clean all surfaces in accordance with manufactures recommendations.
 - a. If manufacturer does not provide recommendations, wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths.
 - b. Take care to remove dirt from corners.
 - c. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work from damage.

END 08520.

DIVISION 8 - DOORS AND WINDOWS
Section 08700 - Finished Hardware

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Finish hardware including hinges, butts, pivots, locksets, latches, bolts, closers, and other miscellaneous hardware.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings:
 - a. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
 - b. Submit manufacturer's parts lists, and templates.
 - c. Submit riser diagrams and wiring diagrams for all electrical hardware items.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.4 SUBMITTALS AT PROJECT CLOSEOUT

- A. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- B. Keys: Deliver with identifying tags to Landmark by security shipment direct from hardware supplier.
- C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- D. Maintenance Products:
 - a. Provide special wrenches and tools applicable to each different or special hardware component.
 - b. Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following requirements:
 - a. AWI.
 - b. BHMA A156 series.
 - c. DHI - A115 series.
 - d. DHI - WDHS.3.
 - e. NFPA 80.
 - f. NFPA 101.
 - g. NFPA 252.
 - h. UL 10B.
 - i. Americans with Disabilities Act (ADA) 1990-28 CFR Part 36.
 - j. Handicapped accessibility requirements adopted by the authority having jurisdiction.
 - k. ANSI 117.1

1.6 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.
- B. Listed and labeled hardware shall be provided for fire rated door openings complying with NFPA 80 and NFPA 101. Labeling shall satisfy requirements of code authorities having jurisdiction.
- C. Conform to applicable building code and ANSI A117.1 for requirements for the physically handicapped for provisions for the disabled.
- D. Conform with UL 10C and UB7-C positive pressure requirements.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.8 WARRANTY

- A. Provide minimum five year manufacturer warranty for door closers.
- B. Provide minimum ten year manufacturer warranty for cylinder locksets.
- C. Provide minimum five year manufacturer warranty for mortise locksets.

D. Provide minimum five year manufacturer warranty for exit devices

PART 2 PRODUCTS

2.1 MATERIAL

A. Hinges, Butts and Pivots: All 7'-0" high hinged doors, except for lead lined or special procedure room doors, shall be provided with one and one half pair 4 1/2" x 4 1/2" square cornered US 26D finish with stainless steel pins. One of the following approved manufacturers and products may be used:

	<u>Stanley #</u> www.stanleycommercialhardware.com	<u>McKinney #</u> www.mckinneyhinge.com	<u>Hager #</u> www.hagerco.com
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- | | | | |
|---|-------------|--------------|------------|
| a. Hollow metal exterior doors up to 40" wide: | FBB-191-NRP | TB-2314-NRP | BB1191-NRP |
| b. Hollow metal exterior doors in excess of 40" wide (5" x 4 1/2" hinge): | FBB-199-NRP | T4B-3386-NRP | BB1199-NRP |
| c. Reverse handed locked interior doors: | FBB-179-NRP | TB-2714-NRP | BB1279-NRP |
| d. Ball bearing butts for interior doors doors greater than 36" and doors with closers: | FBB-179 | TB-2714 | BB1279 |
| e. Standard butts for all other doors not specified: | F-179 | T-2714 | BB1279 |

B. Pivot hinges for lead lined or special procedure room doors shall be US 26D as follows (lead-lined pivot hinges are only required where indicated in physics' report and where lead-lined doors do not have two sheets of lead under each skin of the door):

- | | <u>Rixson #</u> | <u>Dorma #</u> |
|----------------------------|-----------------|----------------|
| a. Top and bottom: | L147 | OPL-440 |
| b. Side jamb intermediate: | ML19 | 75240 |

C. Pivot hinges for toilet room emergency rescue assistance (double swing) doors shall be US 26D as follows :

	<u>Stanley #</u> www.stanleycommercialhardware.com	<u>Rixson #</u>	<u>Dorma #</u>
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- | | |
|---------------------------------|--|
| a. Emergency rescue toilet room | Pivot DAP-3
Strike DLS-1
Stop ES-1 |
|---------------------------------|--|

D. Locks, Latches and Bolts: Door hardware shall be lever design Institutional Grade #1, dull

chrome (US 26D) with standard (2-3/4") backset. Provide interchangeable cores. One of the following approved manufacturers and products may be used:

Corbin/
Russwin # Sargent # Schlage # Best #
www.corbin-russwin.com www.sargentlock.com www.schlage.com www.bestaccess.com

- | | | | | |
|---|----------|----------|------------|-------------|
| a. Key locksets for suite entry (Classroom) | CL 3355 | 10G37-LL | ND70PD-RHO | 93K-R-15D |
| b. Key locksets (6 pin) (Office) | CL 33561 | 10G24-LL | ND50PD-RHO | 93K-E-15D |
| c. Key locksets (6 pin) (Storage) | CL 3357 | 10G04-LL | ND80PD-RHO | 93K-D-15D |
| d. Passages sets | CL 3310 | 10U15-LL | ND10S-RHO | 93K-N-15D |
| e. Privacy sets | CL 3320 | 10U65-LL | ND40S-RHO | 93K-L-15D |
| f. Half (single) dummy trim including strike and pressure latch mounted at the head of door and frame | CL3350 | 10U93-LL | ND170-RHO | 93K-1DT-15D |
| g. Key lockset for elevator equipment room and doors equipped with an electric strike | CL 3357 | 10GO4-LL | ND66PD-RHO | 93K-D-15D |
| h. Lead lined hardware | ML2030 | 8265 | L9040 | 45H-L-15D |
| i. Strike, 4-7/8" with 1-1/4" lip | Standard | 808 | 10-025 | S3 |
| j. Hardware Usage (unless indicated otherwise on Drawings): | | | | |
| i. Locksets: Suite entry doors from public corridors, offices, storage rooms, mechanical rooms, janitor closets and exterior metal doors. | | | | |
| ii. Privacy sets: Toilet rooms for individual occupancy, dark rooms, X-ray rooms, EKG rooms, waiting room doors into suite corridors, consultation and private offices. | | | | |
| iii. Passage sets: All other hinged wood doors except multiple occupancy toilet rooms and doors with panic devices. | | | | |
| iv. Full dummy trim: All pairs of closet doors. | | | | |

E. Electro-Mechanical Cylinder Lock, Latch and Bolt - Key Pad and Card Reader:

- a. Door hardware shall be lever design Institutional Grade, dull chrome (US 26D) with standard (2-3/4") backset. Door hardware on fire rated door shall provide code required latch at all times.
- b. Provide interchangeable cores.
- c. Keypad and proximity reader operated product with minimum of 100 user codes. Locking, and unlocking, shall be done with motor-drive battery powered unit.
- d. Inside lever is always free for egress.
- e. Provide lever design which matches the rest of the building.
- f. Provide 25 HID Proximity Cards, and coordinate card reading capabilities with existing hospital cards.
- g. Insure existing hospital card system will work with these locks.
- h. One of the following approved manufacturers may be used:

Corbin/
Russwin # Sargent # Schlage # Best #
www.corbin-russwin.com www.sargentlock.com www.schlage.com www.bestaccess.com

- i. Product as required to meet specification listed above.

F. Exit Device Hardware:

Corbin/
Russwin # Sargent # Von Duprin #
www.corbin-russwin.com www.sargentlock.com www.vonduprin.com

- a. Wood / Metal Door Panic Hardware:

Rim/ Surface mounted/			
Concealed vertical rods	5000 Series	80 Series	98 Series II
- b. Narrow Stile Aluminum/ Metal Door Panic Hardware:

Rim/ Surface mounted/			
Concealed vertical rods	4000 Series	80 Series	33A Series
- c. Exit Device Usage: Use where required by the building code and as called out in the drawings.

G. Closers and Door Control Devices: shall be sized as required for door size, with adjustable closing and latching speeds, and operating resistance. Closers on doors required to be fire rated shall be listed for the opening requirements.

Norton # Corbin/
Russwin # LCN #
www.nortondoorcontrols.com www.russwin.com www.lcnclclosers.com

- a. Door Closers 8501 Series 6000 Series 4041 Series

- b. Closer Usage: Waiting room to public corridor, doors leading directly from suite corridors to public corridors, stair, exterior hollow metal entrance, public toilet, doors separating corridors, and fire-rated doors. Closer arm adjustment must meet ADA requirements.

H. Other Hardware:

- a. Wall Mounted Door Stops: Shall be provided at all doors swinging against partitions. US 26D finish

<u>Ives #</u> www.ives.ingersollrand.com	<u>Hager #</u> www.hagerco.com
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- b. Hard Surface Floor Mounted Door Stops: Shall be provided at doors without adjacent partition, mounted 1'-6" from the hinge edge of door swing into room, US 26D finish

<u>Ives #</u> www.ives.ingersollrand.com	<u>Hager #</u> www.hagerco.com
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- c. Carpet Floor Mounted Door Stops: Shall be provided at doors without adjacent partition, mounted 1'-6" from the hinge edge of door swing into room, US 26D finish

<u>Ives #</u> www.ives.ingersollrand.com	<u>Hager #</u> www.hagerco.com
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- d. Light and Sound Seal Gasket: Shall be provided at toilet room doors with emergency rescue hardware, dark room, elevator equipment room, compressor room, and audio room doors, and where noted on Drawings.

<u>Reese #</u> www.reeseusa.com	<u>Pemko #</u> www.pemko.com	<u>National Guard #</u> www.ngpinc.com
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- | | | | |
|--|------|---------|--------|
| i. Door jambs and head: | 33C | 379 | --- |
| ii. Door bottom: | 330C | 4301 | --- |
| iii. 20 Min. Door Gasket
(where required by code) | --- | PF114PS | PF-180 |

- e. Door Silencers; shall be provided for all hollow metal door frames, except those scheduled to receive weatherstripping. Provide three (3) per side at typical doors, plus two (2) at the head of double doors.

<u>Ives #</u> www.ives.ingersollrand.com	<u>Hager #</u> www.hagerco.com
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- i. Door Silencer SR64 307D
- f. Sweep and Weather-stripping; shall be aluminum mill finish, and provided at exterior hollow metal doors.
- | | <u>Reese #</u>
www.reeseusa.com | <u>Pemko#</u>
www.pemko.com | <u>National Guard #</u>
www.ngpinc.com |
|----------------------|--|---|---|
| i. Sweep | 323A | 315 | 200NA |
| ii. Weatherstripping | 815A | 303PK | 160SA |
- g. Aluminum Thresholds; shall be aluminum mill finish, and provided at exterior hollow metal doors. Comply with ADA and applicable handicap codes.
- | | <u>Reese #</u>
www.reeseusa.com | <u>Pemko #</u>
www.pemko.com | <u>National Guard #</u>
www.ngpinc.com |
|--|--|--|---|
| i. At Carpet, Entrance Mat, or Hard Tile | S245A | 229 | 325 |
| ii. At Resilient Floor | S205A | 171 | 425 |
- h. Sliding Door Hardware; shall be Stanley, “BPD-60” (www.stanleycommercialhardware.com)
- i. Adjustable floor guide; shall be Stanley, “BP150-71”
 - ii. Bumper stops; shall be Stanley, “BP250-75/BP75-76” as required
 - iii. Pulls; shall be Ives, “22B26D”
- i. Bi-folding Door Hardware; shall be Stanley heavy duty folding door hardware, “BF30” (www.stanleycommercialhardware.com)
- i. Hinges; shall be one and one half pair 3 1/2” x 3 1/2” hinges, US26D finish, Stanley “F179” or Hager “1279”
 - ii. Pulls; shall be 1 1/2” Ives, “522B US26D finish with special length screws.
- j. Pocket Door Hardware; shall be Stanley, “40-5940” (www.stanleycommercialhardware.com)
- i. Pulls; shall be 1 1/2” Ives, “522B US26D finish with special length screws.
 - ii. Edge pull; shall be Ives, “230B26D”.
- k. Astragals; shall be Reese, “92”, (www.reeseusa.com) unless otherwise required by code.
- l. Door coordinator; shall be provided on pairs of doors with astragals, and without a center mullion, and shall be Ives, “Cor Series” (www.schlagelock.com) with USP and painted to match frame finish.
- m. Push / Pull Plates; Push plates shall be McKinney PO52 provided on toilet room doors with more than two fixtures, and shall be 15” x 3 1/2”. Pulls shall be McKinney DP502 with 5 1/2” grip for the pull side, US26D finish.

2.2 KEYING

- A. Key Control Box: with a position for each lockset and 150% future expansion. Each pair of keys shall be individually tagged and placed in the box. One of the followings approved manufacturers and products may be used:
 - a. Lund, "1204A"
- B. Two nickel silver keys stamped "Do Not Duplicate" for each lock shall be provided with keying requirements as follows:
 - a. Each suite shall be keyed differently from every other suite and all locks within any one suite will be keyed alike.
 - b. All building entrance doors to public areas shall be keyed alike and master keyed so that individual suite keys will open them.
 - c. All janitor closet and mechanical room locks shall be keyed alike, so that no individual suite key will open them.
 - d. All locks shall be grand mastered so that a grand master key opens all locks in the building.
 - e. Final keying to be determined by Landmark.
 - f. Provide temporary cores during construction.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on Shop Drawings.
- B. Verify that electric power is available to power operated devices and is of the correct characteristics.

3.2 PREPARATION

- A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- C. Coordinate Owner's keying requirements during the course of the Work.

3.3 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions.
- B. Use templates provided by hardware item manufacturer.
- C. Unless otherwise noted on the Drawings, mounting heights for hardware from finished floor to center line of hardware item shall be as follows:
 - a. Locksets: Standard hollow metal door frame / door locations
 - b. Push/Pulls: 3'-10"
 - c. Dead Locks: 46" to meet ADA
 - d. Exit Devices: 40" or manufacturer's recommended location

3.3 ADJUSTING

- A. Adjust hardware for smooth operation.

3.4 PROTECTION OF FINISHED WORK

- A. Do not permit adjacent work to damage hardware or finish.

END 08700

DIVISION 8 - DOORS AND WINDOWS
Section 08710 – Power Door Operators

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Power door operators.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings:
 - a. Indicate layout and dimensions; head, jamb, and sill conditions; elevations; components, anchorage, recesses, materials, and finishes, electrical characteristics and connection requirements.
 - b. Identify installation tolerances required, assembly conditions, routing of service lines and conduit, and locations of operating components and boxes.
- B. Product Data: Provide data on system components, sizes, features, and finishes.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.

1.4 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data: Include manufacturer's parts list and maintenance instructions for each type of hardware and operating component.
- B. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for automatic release of control drive unit to permit manual opening of doors.
- B. Conform to NFPA 101.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc.
- D. Listed and labeled hardware shall be provided for fire rated and emergency exit door openings complying with NFPA 80.

1.6 WARRANTY

- A. Provide five (5) year manufacturer warranty for operating unit.

PART 2 PRODUCTS

2.1 POWER DOOR OPERATOR

- A. Electro-mechanical devices for door push, and manual push plate operation.
- B. The operator shall comply with ANSI A 156.19 for low energy (handicap assist) door operation.
- C. The operator shall be sized as recommended by the manufacturer for the door size, weight and movement, for condition of exposure, and for long-term maintenance free operation.
 - a. Operator control shall be the manufacturer's standard semi-flush wall mounted push plate for operation by touch of elbow by occupants.
 - b. Operator shall be fully adjustable for opening, closing, and checking speed, and for length of time door is to remain open.
- D. Door shall open manually, or with movement of three (3) degrees, it shall automatically open.
- E. Push Plate Control Device; shall be manufacturer's standard wall mounted, recessed, momentary contact type push plate.
- F. One of the following approved manufacturers and products may be used:
 - a. LCN Closer / Dor-O-Matic, "Benchmark" (www.lcnclosers.com)
 - b. Stanley, "Magic Access Operator" (www.stanleyaccesstechnologies.com)
 - c. Additional equal manufacturers and products may be considered

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces, openings, and recesses are ready to receive work and dimensions are as indicated on the Shop Drawings., and as instructed by the manufacturer.
- B. Verify that electric power is available and of the correct characteristics.

3.2 PREPARATION

- A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

3.3 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Provide for thermal expansion and contraction of door and frame units and live and dead loads that may be transmitted to operating equipment.
- C. Provide for dimensional distortion of components during operation.
- D. Coordinate installation of components with related and adjacent work; level and plumb.

3.4 ADJUSTING

- A. Adjust door equipment for correct function and smooth operation.

3.5 CLEANING

- A. Remove temporary protection, clean exposed surfaces.

END 08710

DIVISION 8 - DOORS AND WINDOWS
Section 08800 – Glass and Glazing

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glazing materials and accessories.
- B. Refer to specification section 13090 – X-Ray Radiation Protection for lead barium glass requirements.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- C. Samples: Submit two samples 1'-0" x 1'-0" minimum in size, exemplifying glass coloration and design.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with FGMA "Glazing Manual", FGMA "Sealant Manual", SIGMA and Laminators Safety Glass Association "Standards Manual" for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- C. Quality Control Testing: Contractor shall perform one field water test on a major portion of the glazed wall or window system in a location determined by Landmark.
 - a. The test shall be conducted in accordance with AAMA 501.2-83 "Field Check of Metal Curtain Walls for Water Leakage."
 - b. Glazing failing the test shall be corrected or replaced, and necessitate an additional test in a location determined by Landmark to be conducted by Contractor.

1.5 REGULATORY REQUIREMENTS

- A. Fire Rated Windows: Conform to ASTM E152, NFPA 252, and UL 10B.
- B. Provide windows which are identical in materials and construction to the systems tested.
- C. Installed Window Assembly: Conform to NFPA 80, and UL fire rated label for fire rated glass as scheduled on the Drawings.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.7 WARRANTY

- A. Provide a minimum five 5 year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.
- B. Provide a minimum five 5 year warranty to include coverage for delamination of laminated glass and replacement of same.

PART 2 PRODUCTS

2.1 INTERIOR GLAZING MATERIALS

- A. Rated Clear Glass; shall be FireLite NT or FireLite Plus, premium grade, as manufactured by Nippon Electric Glass Co. Ltd. (distributed by Technical Glass Products); Or approved equal.
- B. Non-rated interior glazing; for sidelights, windows where rated glass is not required, glass areas within 18” of floors, lights in doors or other hazardous locations shall be minimum 1/4” tempered float glass or laminated safety glass. Other interior glazing shall be 1/4” clear float glass.
- C. Reception by-pass window assemblies; for tenant reception desks, shall be glazed with 1/4” tempered float glass or laminated safety glass installed in Masterroll Overhead Track System (Alternate Assembly for By-Passing Panels) as manufactured by C.R. Laurence Co., Inc in anodized satin finish with Silver Showcase Stick-On Finger Pull and optional chrome plated sliding glass door lock. Exposed glass edges shall be polished. Provide 3-1/2” metal valance to conceal Masterroll Overhead Track System – finish to match Overhead Track.

2.2 GLAZING COMPOUNDS

- A. Modified Oil: ASTM C669, non-hardening, knife grade consistency; Grey color.
- B. Butyl Sealant: ASTM C920, single Component; Shore A hardness of 10 to 20 black color; non-skinning.

- C. Acrylic Sealant: ASTM C920, Type S, Grade NS, single component, solvent curing, non-bleeding; cured Shore A hardness of 15 to 25 color as selected by Landmark.
- D. Polysulfide Sealant: ASTM C920, Type M, Grade NS, two component; chemical curing, non-sagging type; cured Shore A hardness of 15 to 25; color as selected by Landmark.
- E. Polyurethane Sealant: ASTM C920, Type S, Grade NS, single component, chemical curing, non-staining, non-bleeding, Shore A Hardness Range 20 to 35; color as selected by Landmark.
- G. Silicone Sealant: ASTM C920, Type S, Grade NS, single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining, cured Shore A hardness of 15 to 25; color as selected by Landmark.

2.3 GLAZING ACCESSORIES

- A. Setting Blocks: ASTM C864 Neoprene, 80 to 90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4" x width of glazing rabbet space minus 1/16" x height to suit glazing method and pane weight and area.
- B. Spacer Shims: ASTM C864 Neoprene, 50 to 60 Shore A durometer hardness, minimum 3" long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
- D. Glazing Gaskets: ASTM C864 Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; black color.
- E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealant in accordance with manufacturer's instructions.

3.3 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

- A. Cut glazing tape to length and set against permanent stops, projecting 1/16" above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6" from corners.
- C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glazing in same manner described above.
- E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- F. Knife trim protruding tape.

3.4 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

3.5 PROTECTION OF FINISH WORK

- A. Do not permit adjacent work to damage glass and glazing systems.

END 08800

DIVISION 9 - FINISHES
Section 09249 – Adjustable Partition Closure

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manufactured metal closure with insulation

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on components, material, and finish.

PART 2 PRODUCTS

2.1 ADJUSTABLE PARTITION CLOSURE

- A. Partition closures shall be adjustable aluminum with finish to match the aluminum window. One of the following approved manufacturers and products may be used:
 - a. For 2” to 4 1/2” space, Gordon, Inc, Bossier City, LA., “Mullion/Mate I” (www.gordongrid.com)
 - b. For 4 1/2" to 6 1/2" space, Gordon, Inc, Bossier City, LA. “ Mullion/Mate II” (www.gordongrid.com)
 - c. Additional approved equal products shall be considered.
- B. Acoustical sound batt insulations shall be provided at closures and shall provide an STC rating of 38.

PART 3 EXECUTION

3.1 ADJUSTABLE PARTITION CLOSURE

- A. Verify that surface conditions are ready to receive work.
- B. Install Work in accordance with manufacturer's instructions.
- C. Coordinate installation of components with related and adjacent work; level and plumb.

3.2 CLEANING

- A. Remove temporary protection, clean exposed surfaces.

END 09249

DIVISION 9 - FINISHES
Section 09250 - Gypsum Drywall Partitions and Ceilings

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Gypsum drywall partitions, gypsum sheathing, smoke-stop partitions, fire walls, and ceilings including steel studs, steel furring, suspension systems, gypsum board, trim and accessories.
- B. Refer to specification Section 13090 – X-Ray Radiation Protection for lead lined gypsum board requirements.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on metal framing, gypsum board, and joint tape.

1.3 SUBMITTAL FOR INFORMATION

- A. Drywall system manufacturer's brochure including manufacturer's recommendations for joint, embedding and finishing compounds.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- B. Contractor shall design and engineer suspension system components, when required to satisfy code required seismic bracing and support, in accordance with applicable building code.
- C. All work shall comply with the Recommended Specification for the Application and Finishing of Gypsum Board published by the Gypsum Association.
- D. Finishing of gypsum board shall conform to ASTM C840.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for fire rated assemblies.
- B. Provide fire rated gypsum drywall partitions and ceilings as indicated on the Drawings.
- C. Provide fire rated gypsum drywall partitions and ceilings which are identical in materials and construction to the systems tested.
- D. Partitions shall be permanently marked with 2" high stenciling on both sides of wall construction above ceilings with the words "Fire (or Smoke) Barrier of ---- Hour Rating – Do Not Penetrate.

- a. Stenciling shall be repeated every 20'-0" with a minimum of one in each room, unless otherwise required by code.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. A temperature of not less than fifty-five (55) degrees Fahrenheit shall be maintained in areas where joint treatment and compound finishing is being performed for a period twenty-four (24) hours prior to commencing treatment until joint and finishing compounds have dried.

PART 2 PRODUCTS

2.1 FRAMING MATERIALS

- A. Interior Steel Studs: Non load bearing framing systems shall be light gauge cold-formed metal framing consisting of minimum 20 and 25 gauge, 1 1/2", 2 1/2", 3 5/8", and 6" galvanized G-60 steel studs and runners, 24 gauge galvanized steel metal angles, and 8 gauge galvanized power driven screws, tie wires, and fasteners. One of the following approved manufacturers and products may be used:
 - a. Clark Steel Framing Systems, (www.clarksteel.com)
 - b. Dale Industries, (www.daleinc.com)
 - c. Dietrich Metal Framing, (www.dietrichindustries.com)
 - d. Additional approved equal manufacturers shall be considered.
- B. Interior Steel Furring; for masonry or concrete walls, or for conceal structural components or electrical panels and boxes shall be 1 5/8" "C" or 1 1/2" "Z" type, minimum 25 gauge, galvanized G-60 furring channels. One of the following approved manufacturers and products may be used:
 - a. Clark Steel Framing Systems, (www.clarksteel.com)
 - b. Dale Industries, "1 1/2" DWC" (www.daleinc.com)
 - c. Dietrich Metal Framing, (www.dietrichindustries.com)
 - d. Additional approved equal manufacturers shall be considered.
- C. Shaft Wall Studs; shall be light gauge cold-formed metal framing consisting of minimum 20 and 25 gauge, 2 1/2", and 4" C-H galvanized G-60 steel studs and runners and power driven screws and fasteners. One of the following approved manufacturers may be used:
 - a. Clark Steel Framing Systems, (www.clarksteel.com)
 - b. Dale Industries, (www.daleinc.com)
 - c. Dietrich Metal Framing, (www.dietrichindustries.com)

- d. Additional approved equal manufacturers shall be considered.
- D. Horizontal Shaft Wall Studs shall be light gauge cold-formed metal framing consisting of minimum 20 gauge, 2 1/2", 4", 6" E, C-H or I Studs, and J track galvanized steel studs and runners and power driven screws and fasteners conforming to ASTM A525. One of the following approved manufacturers may be used:
- a. United States Gypsum Company (www.usg.com)
 - b. National Gypsum Company (www.nationalgypsum.com)
 - c. Additional approved equal manufacturers shall be considered.
- E. Interior Steel Studs for Lead Lined Walls: Non load bearing framing systems shall be light gauge cold-formed metal framing consisting of minimum 20 gauge, 3 5/8" galvanized G-60 steel studs and runners, 24 gauge galvanized steel metal angles, and 8 gauge galvanized power driven screws, tie wires, and fasteners. One of the following approved manufacturers and products may be used:
- a. Clark Steel Framing Systems, (www.clarksteel.com)
 - b. Dale Industries, (www.daleinc.com)
 - c. Dietrich Metal Framing, (www.dietrichindustries.com)
 - d. Additional approved equal manufacturers shall be considered.
- F. Gypsum Board Ceiling Suspension Components:
- a. Main Runners: 1 1/2" channels weighing not less than 0.475 pounds per lineal foot, factory painted, conforming to ASTM A109 and ASTM C635
 - b. Cross Furring: 3/4" channels, spaced at 24" on center, weighing not less than .300 pounds per lineal foot, factory painted, conforming to ASTM A109 and ASTM C635.
 - c. Wire: 9 gauge for hangers and 16 gauge for tying; galvanized.
 - d. Suspension components; shall be modified as required to comply with seismic design.
 - e. One of the following approved manufacturers may be used:
 - i. Clark Steel Framing Systems, (www.clarksteel.com)
 - ii. Dale Industries, (www.daleinc.com)
 - iii. Dietrich Metal Framing, (www.dietrichindustries.com)
 - iv. Additional approved equal manufacturers shall be considered.

2.2 GYPSUM BOARD MATERIALS

- A. Interior Gypsum Board: shall be shall be 1", 5/8", 1/2", and 1/4" thick as indicated on the Drawings. Edges shall be tapered or eased.
 - a. Fire rated partitions; shall be 5/8" type "C" or type "X" fire rated gypsum board.
 - b. Fire rated shaft walls; shall be constructed of gypsum drywall thickness (typically 1") by the manufacturer, and of the thickness required by the U.L. tested assembly.
 - c. Moisture resistant gypsum board; shall be 5/8" and shall be provide in bathrooms, and other wet areas noted on the Drawings.
 - d. Ceiling, headers, and soffit gypsum board; shall be 1/2" thick.
 - e. Interior Gypsum Board provided above finish ceilings at non-rated exterior walls shall be 1/4" non-rated gypsum board.
 - f. Refer to specification section 13090 – X-Ray Protection for lead lining requirements.
 - g. One of the following approved manufacturers may be used:
 - i. United States Gypsum Company (www.usg.com)
 - ii. Georgia Pacific (www.gp.com)
 - iii. National Gypsum Co, Gold Bond Building Products (www.gold-bond.com)
 - iv. Additional approved equal manufacturers shall be considered.
- B. Glass Mesh Mortar Unit: One of the following approved manufacturers and products may be used:
 - a. Georgia-Pacific 1/2" "Dens-shield" (www.gp.com)
 - b. Glascrete 7/16" "Wonderboard"
 - c. United States Gypsum, 1/2" "Durock" (www.usg.com)
 - d. Additional approved equal products shall be considered.

2.3 ACCESSORIES

- A. Slip-Type Head Joints: Where indicated, provide one of the following:
 - a. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
 - b. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

- c. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - i. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Brady Innovations: Sliptrack Systems, SLP-TRK
 - b. Steel Network Inc.; VertiClip Series.
 - c. Metal Lite Inc – The System.
 - d. Additional approved equal manufacturers shall be considered

- B. Mineral Wool Insulation: shall be friction fit type, un-faced, 2” thick 2 1/2” pound density sound attenuation mineral wool. Shaft wall insulation shall be mineral wool sound attenuating insulation conforming to the requirements of the UL assembly listed. One of the following equal manufacturers and products may be used:
 - a. Certain Teed, “Thermafiber” (www.certainteed.com)
 - b. Johns Manville, “Minwool 1200” (www.jm.com)
 - c. Additional approved equal products shall be considered

- C. Fill, Void or Cavity Material: Min 1/16 in. dry, (1/8 in. wet) thickness of fill material sprayed or brushed on each side of the wall in the flutes of the steel floor units and between the top of the gypsum board and the bottom of the steel floor units to completely cover mineral wool and overlap a min of 1/2 in. onto gypsum board and steel deck on both sides of wall. Products must conform to the requirements of the UL assembly listed. One of the following equal manufacturers and products may be used:
 - a. 3M Company – Firedam Spray 200
 - b. Additional approved equal products shall be considered

- D. Fiberglass Sound Batt Insulation: shall be friction type, un-faced thermal batt type fiberglass insulation, 3 1/2”, R-11, complying with ASTM C665, Type III, Class A at all walls with a gypsum drywall finish. One of the following equal manufacturers and products may be used:
 - a. Certain Teed Corp., “CentraPro AcoustaTherm” (www.certainteed.com)
 - b. Johns Manville Corp., “Easy Fit” (www.jm.com)
 - c. Owens-Corning Fiberglass Corp., “Unfaced Thermal Batt Insulation” (www.owenscorning.com)
 - d. Additional approved equal products shall be considered

- E. Acoustical sealant; shall be as recommended by the manufacturer of the gypsum board.

- a. Sealant shall be highly elastic, water-based, non-hardening, non-drying, non-bleeding, or staining conforming to ASTM 919.
 - b. One of the following approved manufacturers and products may be used:
 - i. United States Gypsum Company, “Acoustical Sealant” (www.usg.com)
 - ii. Additional approved equal products shall be considered.
- F. Fasteners: ASTM C1002, Type S12, W, and GA-216.
- G. Metal Trim:
- a. Metal trim features for gypsum board shall be formed from 25 gauge minimum zinc-coated steel and shall conform to FS QQ-S-775, Type I, Class D or E.
 - b. Corner beads shall be combination metal and paper wings, bonded together, not less than 1 1/4” wide suitable for joint treatment conforming to ASTM C1047 standards.
 - i. United States Gypsum Company - Sheetrock - Paper Faced Metal Bead
 - ii. Additional approved equal products shall be considered.
 - c. Zinc control joints shall be 1/4” in width, 7/16” deep equal to No. 093, suitable for joint treatment.
 - d. J- Bead trim shall be equal to USG B9 Series.
- H. Setting Type Joint Compound/Adhesive: Factory prepackaged, job mixed, chemical-hardening powder products; Use for moisture resistant gypsum board. One of the following approved manufacturers and products may be used:
- a. Georgia Pacific, “Speed Set” (www.gp.com)
 - b. National Gypsum Co, Gold Bond Building Products, “Sta-Smooth” (www.gold-bond.com)
 - c. United States Gypsum, “Durabond” (www.usg.com)
 - d. Additional approved equal products shall be considered.
- I. Ready-Mixed Joint Compound: Ready-mix compound for filling/tape bedding and topping; use for standard gypsum board. One of the following approved manufacturers and products may be used:
- a. Georgia-Pacific, “Ready Mix All Purpose Compound” (www.gp.com)
 - b. National Gypsum Co, Gold Bond Building Products, “Ready Mix Joint Compound (all purpose)” (www.gold-bond.com)
 - c. United States Gypsum, “Ready Mixed Joint Compound” (www.usg.com)

- d. Additional approved equal products shall be considered
- J. Miscellaneous Materials and Accessories:
- a. Reveals shall be extruded aluminum alloy 6063 TS, 5/8" deep by 1" high, manufactured by Fry Reglet #DRM-625-100 or equal by MM Systems Corporation. Finish shall be clear anodized.
 - b. Self-tapping, shouldered flathead screws; shall be not less than 1" long, specially designed for use with the power-driven tools shall be provided for fastening gypsum board and gypsum sheathing in place. Exterior wall sheathing screws shall be corrosion resistant, either cadmium plated or with a proprietary coating.
 - c. Sheathing tape for exterior wall sheathing; shall be designed and manufactured to seal joints against water and air infiltration and formulated with an adhesive that permanently bonds to the sheathing as recommended by the manufacturer.
 - d. Joint Tape: shall be paper reinforcing tape.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and opening dimensions are as indicated on Drawings.
- B. Alignment of framing members shall be checked and necessary adjustments made prior to proceeding with application of gypsum board.

3.2 COORDINATION

- A. Interior Partitions:
 - a. Unrated interior partitions forming the corridor and the tenant demising wall of the undeveloped areas (future tenant suite) shall have gypsum board omitted on the undeveloped area side.
 - b. Smoke tight or full height gypsum board partitions shall extend the one layer of gypsum board on the developed side of the partition to the full height, from floor to structure above, smoke tight.
 - c. Acoustical Insulation shall be provided as detailed on the Drawings.
- B. Exterior Walls:
 - a. Undeveloped areas (future tenant suite) shall have the gypsum board omitted on the undeveloped area side of the partition from the floor up to the suspended ceiling.

- b. Gypsum board shall be installed above the ceiling, and form a complete building envelope.
- c. Thermal insulation and vapor barrier shall be installed for the full height of the partition as detailed on the Drawings.

3.3 METAL STUD INSTALLATION

- A. Install studs in accordance with ASTM C754, GA201, GA216, GA600, and manufacturer's instructions.
- B. Metal Stud Spacing: 24" on center, with top and bottom tracks, unless noted otherwise on the Drawings.
- C. Metal Furring Spacing: 16" on center, with top and bottom tracks, unless noted otherwise on the Drawings.
- D. Lead Lined Gypsum Board Stud Framing: 16" on center, with top and bottom tracks, extending full height from floor to structure above.
- E. Refer to Drawings for indication of partitions extending stud framing through the ceiling to the structure above.
 - a. Maintain clearance under structural building members to avoid deflection transfer to studs.
 - b. Provide extended leg ceiling runners.
- F. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.
- G. Blocking: Nail wood blocking to studs, or screw steel channels to studs.
 - a. Wood blocking shall be provided in accordance with Section 06100 – Rough Carpentry.
 - b. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame opening, toilet accessories, hardware, medical equipment, etc.
 - c. Provide extra nailers, and metal reinforcing plates for solid support of fixture attachments where necessary.
 - d. Minimum sixteen (16) gauge sheet metal straps or metal studs may be substituted for wood blocking.
- H. Non-full height partitions longer than 8'-0" between intersection partitions or structural columns shall be braced at 4'-0" o.c. to underside of structure above by diagonal stud braces or full height studs.
- I. Bracing and full height studs shall be installed after dead loads above the partitions have been imposed.

- J. Building expansion joints shall not be bridged with framing. Frame both sides of the joint with studs or furring.

3.4 GYPSUM BOARD CEILING FRAMING INSTALLATION

- A. Install in accordance with ASTM C754, GA201, GA216, and manufacturer's instructions.
- B. Coordinate location of hangers with other work.
- C. Install ceiling framing independent of walls, columns, and above ceiling work.
- D. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24" past each end of openings.
- E. Laterally brace entire suspension system.

3.5 ACOUSTIC ACCESSORIES INSTALLATION

- A. Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
- B. Install acoustic sealant within partitions in accordance with manufacturer's instructions. Install two beads under metal track.
 - a. Caulk all penetrations of partitions by conduit, pipe, duct work, and rough-in boxes.
- C. Install gypsum board in partitions receiving acoustical accessories with a 1/4" to 1/2" isolation joint at the floor and structure above, after installation of metal trim. Embed gypsum board on each side at the floor in acoustical sealant.

3.6 GYPSUM BOARD INSTALLATION

- A. Install gypsum board in accordance with GA201, GA216, GA600, and manufacturer's instructions.
- B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing. Install vertically where possible to minimize or eliminate exposed end-butt joints.
- C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
- D. Install gypsum board with face side out, with adjacent boards in moderate contact and not more than 1/16" open space between boards. Do not force into place.

- E. Imperfect, damaged or damp boards shall not be installed. Do not piece-in gypsum board above doors or around other openings.
- F. At internal and external corners, the cut edges of boards shall be concealed by overlapping uncut edges of abutting boards. Boards shall be staggered so that corners of any four boards do not meet at a common point except at vertical corners.
- G. All joints shall be located over supports. End-butt joints shall be located as far from center of walls and ceilings as possible, staggered not less than 2'-0" in alternate courses of board.
- H. Boards shall be positioned so that similar edge conditions abut. Tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field cut ends.
- I. Vertical joints shall be staggered over different studs on opposite sides of partitions.
- J. Provide gypsum board returns for window head, jamb, and sill, at sliding and bi-fold door heads and jambs, and at other openings in partitions.
- K. Gypsum board ceilings shall be installed with long dimension of the board at right angles to the supporting members, except that boards may be installed with the long dimension parallel to supporting members that are spaced at 16" on center when attachment members are provided at end joints.
- L. Provide aluminum reveals in gypsum board as indicated on the Drawings.
- M. Use screws when fastening gypsum board to metal furring or framing. Screws shall be driven with clutch-controlled power screwdrivers, spaced at 1'-0" on center at ceilings and at walls, and 8" on center at all edges, unless otherwise required by fire rated UL listed assembly requirements.
- N. Double Layer Applications: Use gypsum backing board for first layer, placed perpendicular to framing or furring members. Use fire rated gypsum backing board for fire rated partitions and ceilings.
 - a. Secure second layer to first in accordance with UL fire rated requirements.
 - b. Place second layer perpendicular to first layer, unless otherwise required by UL or code. Offset joints of second layer from joints of first layer.
- O. Treat cut edges and holes in moisture resistant gypsum board with sealant.
- P. Place control joints consistent with lines of building spaces, and as indicated on the Drawings.
 - a. Install control joints in corridors at minimum 30'-0" o.c. spacing.
 - b. Coordinate control joints in corridors with suite entry door detail indicated on the Drawings.
- Q. Place corner beads at external corners. Use longest practical length. Place edge trim where

gypsum board abuts dissimilar materials.

3.7 METAL TRIM INSTALLATION

- A. External corners shall receive a corner bead fitting neatly over the corner and secured with joint compound.
- B. Wall control joints shall be provided where indicated on Drawings with legs attached to back-to-back studs with a 1/2" space between.
 - a. Space shall receive fire safing and acoustical sealant at each face directly behind the metal control joint at fire-rated partitions.
 - b. Space shall receive acoustical insulation and sealant at non-fire rated partitions receiving acoustical insulation.
- C. Ceiling control joints shall be provided where indicated on Drawings with legs attached to back-to-back suspension members with a 1/2" space between.
- D. J-Bead trim shall be installed where gypsum board abuts the bottom of plastic laminate writing ledges, wall caps, reception window counters and other similar conditions.

3.8 GLASS MESH MORTAR UNITS

- A. Install glass mesh mortar units at all ceramic tile showers, tub enclosures, and similar "wet" areas.

3.9 JOINT TREATMENT

- A. Joint treatment and finishing compound shall be applied by machine or hand tool.
- B. Drying time shall be a minimum of twenty-four (24) hours between coats with additional drying time provided in poorly ventilated areas.
- C. Embedding compound shall be applied to joints and fastener heads in a thin uniform layer. Finishing compound shall be applied to all joints and fastener heads feathered to not less than 12" wide.
- D. Compound shall be spread not less than 3" wide at joints, with reinforcing tape centered in the joint, and the tape embedded in the compound. A thin layer of compound shall then be spread over the tape.
- E. On walls to be finished, a second coat of embedding compound shall be applied to joints and fastener heads, spreading in a thin uniform coat not less than 6" wide at joints with feathered edges. When thoroughly dry, treatment shall be sanded to eliminate ridges and high points.
- F. When thoroughly dry, surfaces shall be sanded to obtain uniformly smooth surfaces, taking care to not scuff the paper surface of the gypsum board.

- a. Joints shall not be visible through finish materials.
- b. Feather coats on to adjoining surfaces so that camber is maximum 1/32".
- G. The base of partitions shall be sufficiently finished so that joints do not show through the rubber base.
- H. Corner Treatment:
 - a. Internal corners shall be finished as specified for joints, except that the reinforcing tape shall be folded lengthwise through the middle and fitted neatly into the corner.
 - b. External corners shall receive manufactured paper faced corner bead as specified and shall be treated with joint compounds, feathering the compound out a minimum of 8" on each side of the corner.
- I. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.
- J. Fill and finish joints and corners of glass mesh mortar units.
- K. Finish in accordance with GA214 Level:
 - a. Level 1: Above finished ceilings concealed from view, plenum areas, and concealed areas, unless a higher finish is required for fire rated assembly and sound rated assembly.
 - b. Level 2: Where water resistant gypsum backing board forms the substrates for ceramic tile.
 - c. Level 3: Walls to receive vinyl wall covering.
 - d. Level 4: Walls and ceilings exposed to view.
 - e. Level 5: Lobbies and Atriums walls and ceilings exposed to view.

3.10 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8" in 10 feet in any direction.

3.11 SCHEDULE

- A. Drywall partitions and column enclosures shall be provided to the following criteria, unless noted otherwise on the Drawings:
 - a. 2-Hour Rated Drywall Partition; shall comply with UL Design No. U412 or approved equal.

- b. 1-Hour Rated Drywall Partition; shall comply with UL Design No. U465 or approved equal.
- c. 2-Hour Rated Drywall Shaft Partition; shall comply with UL Design No. U438 or approved equal.
- d. 1-Hour Rated Drywall Shaft Partition; shall comply with UL Design No. U469 or approved equal.
- e. 1 and 2-Hour Rated Drywall Column Enclosure; shall comply with UL Design No. X528 or approved equal.

END 09250

DIVISION 9 - FINISHES
Section 09300 - Tile

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Ceramic floor, base and wall tile and granite floor, base, and wall tile, adhesives, mortar, grout and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide instructions for using grouts and adhesives.
- B. Grout color samples for selection.
- C. Granite floor tile and base samples; provide a minimum of two 12" x 12" samples of each granite tile scheduled to be used on the project.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.
- B. Extra Material: Identify Owner's storage room location, and store extra material in original cartons.
- C. Granite Tile Sealer Warranty: Provide 15 year performance warranty.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- B. Install tile in conformance with the Tile Council of America's "Handbook for Ceramic Tile Installation".
- C. Provide tile in conformance with Americans with Disability Act (ADA) 1990-28 CFR Part 36, recommended static coefficient of friction of 0.6.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install adhesives in an unventilated environment.
- B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.6 EXTRA MATERIAL

- A. A minimum of three (3) percent of each color ceramic tile, and three (3) percent or ten (10) pieces, whichever is greater, of granite tile and base.

PART 2 PRODUCTS

2.1 CERAMIC TILE MATERIALS

- A. CT-1: Porcelain Floor/Wall/Base Tile shall be “Cross Sheen” finish, 12” x 12” thin-set wall tile with bullnose top. One of the following approved manufacturers and products may be used:
 - a. Crossville, “Color Blox, Treehouse A1114” (www.crossvilleinc.com)
 - i. GR-1 Grout color shall be Custom Building Products, “52 Tobacco Brown” (www.custombuildingproducts.com)
 - b. Additional approved equal products shall be considered.
- B. CT-2: Porcelain Floor/Wall/Base Tile shall be “Cross Sheen” finish, 12” x 12” thin-set wall tile with bullnose top. One of the following approved manufacturers and products may be used:
 - a. Crossville, “Color Blox Sidewalk Chalk A1109” (www.crossvilleinc.com)
 - i. GR-2 Grout color shall be Custom Building Products, “9 Natural Gray” (www.custombuildingproducts.com)
 - b. Additional approved equal products shall be considered.
- C. CT-3: Porcelain Floor/Wall/Base Tile shall be “Cross Sheen” finish, 12” x 12” thin-set wall tile with bullnose top. One of the following approved manufacturers and products may be used:
 - a. Crossville, “Color Blox, Chocolate Candy A1118” (www.crossvilleinc.com)
 - i. GR-3 Grout color shall be Custom Building Products, “105 Earth” (www.custombuildingproducts.com)
- D. CT-4: Porcelain Floor/Wall/Base Tile shall be “Cross Sheen” finish, 12” x 12” thin-set wall tile with bullnose top. One of the following approved manufacturers and products may be used:
 - a. Crossville, “Color Blox, I See The Moon A1117” (www.crossvilleinc.com)
 - i. GR-4 Grout color shall be Custom Building Products, “335 Winter Gray” (www.custombuildingproducts.com)
- E. CT-5: Porcelain Floor/Wall/Base Tile shall be “Cross Sheen” finish, 12” x 12” thin-set wall tile with bullnose top. One of the following approved manufacturers and products may be used:
 - a. Crossville, “Color Blox, Sea Otter A1108” (www.crossvilleinc.com)
 - i. GR-5 Grout color shall be Custom Building Products, “145 Light Smoke” (www.custombuildingproducts.com)

- b. Additional approved equal products shall be considered.
- F. CT-6: Porcelain Floor/Wall/Base Tile shall be “Cross Sheen” finish, 12” x 12” thin-set wall tile with bullnose top. One of the following approved manufacturers and products may be used:
 - a. Crossville, “Color Blox, Slinky A1103” (www.crossvilleinc.com)
 - i. GR-6 Grout color shall be Custom Building Products, “386 Oyster Gray” (www.custombuildingproducts.com)
 - b. Additional approved equal products shall be considered.

2.3 SOLID SURFACING MATERIAL

- A. Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.
- B. Available Products: Subject to compliance with requirements. One of the following approved manufacturers and products may be used:
 - a. Wilsonart Gibraltar - Acrylic Solid Surface.
 - b. Additional approved equal products shall be considered.

2.4 ACCESSORIES

- A. Trowelable underlayment and patching compounds shall be latex modified Portland cement based formulation provided or approved by tile setting manufacturer.
- B. Transition strip: Zinc “L” shaped transition strips provided at all ceramic tile and granite stone tile floor transitions to carpet, and to vestibule rugs. Height shall match the height of the adjacent tile surface.
 - a. Manhattan American Terrazzo Strip Company
 - b. Additional approved equal products shall be considered.
- C. Wall trim strip: Clear satin anodized aluminum edge protection from outside tile-to-tile corner applications. Select trim strip according to tile thickness. One of the followings approved manufacturers and products may be used:
 - a. Schluter, “Rondec-AE” (www.schluter.com)
 - b. Additional approved equal products shall be considered
- D. Isolation Membrane Barrier: Isolation barrier shall provide a monolithic film over floor to stop in-plane cracks from transferring through tile. One of the following approved manufacturers and products may be used:
 - a. TEC, “Roll on Crack Isolation Membrane” (www.tecspecialty.com)

- b. Additional approved equal products shall be considered.
- E. Sealant: Elastomeric sealants. Refer to Section 07900 – Caulks and Sealants for more information. Color shall match grout.

2.5 ADHESIVE, MORTAR AND GROUT MATERIALS

- A. Approved manufacturers; Subject to compliance with requirements, one of the following approved manufacturer's may be used:
 - a. Custom Building Products (Polyblend Grout)
 - b. TEC
 - c. Bostik Company
 - d. MAPEI
 - e. Additional approved equal manufacturers may be considered.
- B. Adhesive:
 - a. Organic Adhesive: ANSI A136.1, thin-set bond type; use Type I in areas subject to prolonged moisture exposure. (TCA W242).
 - b. Epoxy Adhesive: ANSI A118.3, thin-set bond type.
 - c. Tile Setting Adhesive: Elastomeric, waterproof, liquid applied.
- C. Latex Portland Cement Mortar (thin set): ANSI A118.4
 - a. Prepackaged dry-mortar mix containing dry additive to which only water must be added.
 - b. Prepackaged dry-mortar mix combined with liquid latex additive.
 - c. For wall application, provide non-sagging mortar.
- D. Bond Coat Materials:
 - a. Dry-Set Portland Cement Type: ANSI A118.1
 - b. Latex-Portland Cement Type: ANSI A118.4
- E. Standard Grout: ANSI A118.6, Latex-Portland cement.
- F. Polymer Modified Tile Grout: ANSI A118.7
 - a. Polymer Type; dry redispersible form, prepackaged with other dry ingredients.
 - b. Polymer Type; liquid latex form for addition to prepackaged dry grout mix.
- G. Water Cleanable Epoxy Grout: ANSI A118.8 modified epoxy emulsion grout.

H. Schedule:

- a. Ceramic floor tile and base shall be thin-set:
 - i. Mortar shall be dry-set or latex Portland cement mortar bond coat.
 - ii. Grout shall be standard sanded cement grout.
- b. Ceramic wall tile over gypsum board shall be thin-set:
 - i. Organic adhesive.
 - ii. Grout shall be polymer modified sanded grout.

2.6 GRANITE TILE SEALER

- A. Granite tile sealer shall be stain proof, penetrating, invisible and breathable sealer that protects exposed granite tile and grout from damage caused by weather, salts and oil based stains. One of the following approved manufacturers and products may be used:
 - a. Drytreat, "Stain-Proof Sealer" (www.drytreat.com)
 - b. Additional approved equal products shall be considered.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Surface to be tiled shall fall within maximum variations as follows:
 - a. Floors: 1/8" in 10'-0".
 - b. Walls: 1/8" in 8'-0"

3.2 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances, and as compatible with tile mortar.
- D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.3 INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through

- A108.10, manufacturer's instructions, and TCA Handbook recommendations.
- B. Lay tile as specified below. Do not interrupt tile pattern through openings.
 - a. Suite Toilet Room Ceramic Tile Floor and Base: 12" x 12" ceramic tile floor shall start with a full tile at the entry door wall with ceramic centered in the other direction. Universal cove base tile 6" high x 12" wide to be installed throughout. Ceramic tile base joints shall align with joints in floor tile.
 - b. Granite and other Ceramic Tile Floor and Base: Center in room or as indicated on the Drawings.
 - C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor, base and wall joints.
 - D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
 - a. Ceramic Tile Floor, Base, and Walls: Joints shall be aligned with even 1/16" width, with 3/32" maximum at room perimeter.
 - b. Porcelain Tile Floor and Base: Joints shall be aligned with even 3/16" width, with 1/4" maximum at room perimeter.
 - E. Install zinc "L" shaped floor transition strip at all ceramic tile and porcelain tile floor transitions to carpet, to vestibule mat, and to vestibule rugs.
 - a. Height shall match the height of the adjacent tile surface.
 - b. Nail or screw floor attachment before thin set of tile is placed.
 - c. Install "L" shaped transition strip in accordance with manufacturers instructions and recommendations.
 - F. Form internal angles square and external angles bullnosed.
 - G. Install ceramic accessories rigidly in prepared openings.
 - H. Sound tile after setting is complete. Replace hollow sounding units.
 - I. Keep expansion, and control joints free of adhesive or grout.
 - J. Allow tile to set for a minimum of 48 hours prior to grouting.
 - K. Grout tile joints. Use standard grout unless otherwise indicated. Grout shall be mixed in a single batch for a given room or area so as to provide uniform color and texture.
 - L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.4 EXPANSION JOINTS

- A. Locate sealant filled joints where indicated on the Drawings and as noted herein. Locate joints during installation of setting material, mortar beds and tile. Do not saw-cut joints after installation.
- B. Locate joints in concrete substrate. Install isolation membrane barrier over substrate joint. Install tile joint adjacent to substrate joint without cutting tile.
- C. Locate tile expansion joints as recommended by tile manufacturer and by TCA Handbook recommendations.

3.5 INSTALLATION – CERAMIC FLOORS TILE - THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCA Handbook Method F113, dry-set or latex-portland cement bond coat F116, organic adhesive, with standard grout, unless otherwise indicated.

3.6 INSTALLATION – CERAMIC WALL TILE

- A. On glass mesh mortar board walls in showers install in accordance with TCA Handbook Method W244, thin-set.
- B. On water resistant gypsum board walls, install in accordance with TCA Handbook Method W244, thin set.

3.7 INSTALLTION – GRANITE FLOOR AND WALL TILE

- A. Install in accordance with granite floor quarry recommendations and TCA Handbook, Method F113 dry-set or latex Portland cement bond coat F116, organic adhesive, with standard grout, unless otherwise indicated.

3.8 CLEANING – CERAMIC FLOOR AND WALL TILE

- A. Clean ceramic tile floor and wall tile and grout surfaces of all foreign material.
- B. Acid solutions shall be used only when permitted by and in accordance with the ceramic floor and wall tile and grout manufacturer's printed instructions.
- C. Do not seal ceramic floors or wall tile.

3.9 CLEANING – GRANITE FLOOR AND WALL TILE

- A. Clean granite and grout surfaces of all foreign material.
- B. Acid solutions shall be used only when permitted by and in accordance with the granite floor and wall tile and grout manufacturer's printed instructions.
- C. Seal granite floor and wall tile with Granite Tile Sealer
 - a. Seal in accordance with manufacturers recommendations.

3.10 PROTECTION OF FINISHED WORK

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END 09300

DIVISION 9 - FINISHES
Section 09510 - Acoustical Ceilings

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Suspended acoustical tile ceilings including ceiling tile, grid, suspensions systems, and miscellaneous trim for a complete installation.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on metal grid system components, and acoustic units.

1.3 SUBMITTALS AT PROJECT CLOSEOUT

- A. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- B. Extra Material: Identify Owner's storage room location, and store extra material in original cartons.
- C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the following the CISCA, "Ceiling Systems Handbook"
- B. Contractor shall design and engineer ceiling suspension system components, when required to satisfy code required seismic bracing and support, in accordance with applicable building code.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F and maximum humidity of 40 percent prior to, during, and after acoustic unit installation.

1.6 EXTRA MATERIALS

- A. Provide a minimum of 100 square feet of ceiling tile shall be left at the jobsite for ceiling repair.

1.7 WARRANTY

- A. Provide minimum ten year manufacturer warranty against sag in normal humidity locations.

PART 2 PRODUCTS

2.1 SUSPENSION SYSTEM

- A. Suspension System: Ceiling suspension system; main runners, cross tees, variable placement tees and grid adapters and other trim shall be cold rolled electro-galvanized steel and steel cap with a standard soft white factory applied paint finish. Main runners shall conform to the intermediate duty classification of ASTM C635. One of the following approved manufacturers and products may be used:
- a. Chicago Metallic Corp., “No. 211” (www.chicago-metallic.com)
 - b. USG, “Donn DX intermediate duty series” (www.usg.com)
 - c. Additional approved equal products shall be considered.
- B. Washable Ceiling Suspension System: Ceiling suspension system; main runners, cross tees, variable placement tees and grid adapters and other trim shall be the same as Suspension System specified above. Provide cleaning protection systems for the tile including a minimum of two retention clips per tile, and gaskets, as required by health department. One of the following approved manufacturers and products may be used:
- a. Chicago Metallic Corp., “No. 211” (www.chicago-metallic.com)
 - b. USG, “Donn DX intermediate duty series” (www.usg.com)
 - c. Additional approved equal products shall be considered.
- C. Clean Room Ceiling Suspension System: Ceiling suspension system; 1-1/2” main runners, 1-1/2” cross tees, variable placement tees and grid adapters, wall angles, and hold-down clips. Provide cleaning protection systems for the tile including a minimum of two retention clips per tile, and gaskets, as required by health department. One of the following approved manufacturers and products may be used:
- a. Armstrong World Industries, Clean Room Grid System (www.armstrong.com)
 - b. Additional approved equal products shall be considered.
- D. Perimeter wall angle shall be “L” shape product. One of the following approved manufacturers and products may be used:
- a. Chicago Metallic Corp., “No. 1420-01” (www.chicago-metallic.com)
 - b. USG, “Donn, Wall Angle” (www.usg.com)
 - c. Additional approved equal products shall be considered.

2.2 ACOUSTICAL TILE CEILING

- A. Interior acoustical tile ceiling tiles: shall be white, reveal edge, 24" x 24" x 3/4" with a CAC minimum rating of 35. One of the following approved manufacturers and products may be used:
 - a. USG, "F Fissured SL #132". (www.usg.com)
 - b. Additional approved equal products shall be considered.
- B. Interior acoustical tile ceiling tiles; Rectangular tile shall be white, reveal edge, 24" x 48" x 3/4" with a CAC minimum rating of 35. One of the following approved manufacturers and products may be used:
 - a. USG, "F Fissured SL #136". (www.usg.com)
 - b. Additional approved equal products shall be considered.
- C. Washable acoustical tile ceiling tiles; shall be white, square edge, 24" x 48" x 1/2" vinyl faced scrubbable ceiling tile.
 - a. USG, "Sheetrock Brand Climaplus Vinyl #3270" (www.usg.com)
 - b. Additional approved equal products shall be considered.
- D. Clean room ceiling tiles; shall be white, square edge, 24" x 24" x 1/2" vinyl faced, vinyl backing and sealed edges scrubbable ceiling tile.
 - a. Innotech Products, Inc., Envirogard Ceiling Tiles #WI-1192CRF1
 - b. Additional approved equal products shall be considered.
- E. Clean room ceiling tiles; shall be white, square edge, 24" x 48" x 1/2" vinyl faced, vinyl backing and sealed edges scrubbable ceiling tile.
 - a. Innotech Products, Inc., Envirogard Ceiling Tiles #WI-1190CRF1
 - b. Additional approved equal products shall be considered.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that layout of hangers will not interfere with other work.
- B. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, dead loads have been applied, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- C. Install acoustic units after interior wet work is dry.

3.2 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636, ASTM E580, and manufacturer's instructions.
- B. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.
- C. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- D. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- G. Support fixture loads by supplementary hangers located within 6" of each corner; or support components independently.
- H. Do not eccentrically load system, or produce rotation of runners.
- I. Install suspension system so component deflects more than $L/360$ of the span under loaded conditions, and as recommended by the acoustic tile manufacturer.
- J. Main runners shall be installed at 4'-0" on center and be supported by not less than No. 12 SWG Galvanized steel hanger wire spaced a maximum of 48" on center.
 - a. Hanger wires shall be wrapped tightly at least three full turns.
 - b. Additional hanger wires adjacent to light fixtures as required by ASTM C636 shall be provided.
 - c. Hanger wires shall be attached to trapezes where required to span large ducts, not to ductwork.
- K. Main runners shall be interconnected by cross tees, 4'-0" long at 2'-0" on center to form nominal 2'-0" x 4'-0" modules. 2'-0" long interconnecting members shall be installed at 2'-0" on center and form nominal 2' x 2" modules. Proper length cross tees shall also be installed adjacent to all recessed fluorescent light fixtures on each side not supported by a main runner.
- L. Install ceilings symmetrically about the center lines of the rooms unless otherwise indicated on the Drawings.
- M. Install accessories for Washable Ceilings and Clean Room Ceilings as recommended by manufacturer.

N. Perimeter Wall Angles:

- a. Install edge molding at intersection of ceiling and vertical surfaces.
 - b. Use longest practical lengths.
 - c. Overlap and rivet corners.
 - d. Provide at junctions with other interruptions.
 - e. Install with screws into partition top track or with other fastening devices as recommended by the suspension system manufacturer, 1'-4" on center, and not more than 3" from ends.
- O. Form expansion joints as detailed. Form to accommodate plus or minus 1" movement. Maintain visual closure.
- P. Install washable ceiling grid gaskets in accordance with manufacturer's instructions, and as required by health department.

3.2 INSTALLATION - ACOUSTIC UNITS

- A. Install acoustic units in accordance with manufacturer's instructions.
- B. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units in basket weave pattern. Fit border trim neatly against abutting surfaces.
- D. Install acoustic units level, in uniform plane, and free from twist, warp, and dents.
- E. Cutting Acoustic Units:
 - a. Cut to fit irregular grid and perimeter edge trim.
 - b. Cut edges to field cut units to match manufactured cut edges.
 - c. Double cut and field paint exposed edges of irregular units.
- F. Install hold-down clips to retain panels tight to grid system within 20'-0" of an exterior door and in washable ceiling tile locations.
- G. Install accessories required for Washable Ceilings, and Clean Room Ceilings.

3.3 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8" inch in 12'-0".

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END 09510

DIVISION 9 - FINISHES
Section 09650 - Resilient Flooring

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient flooring, rubber base, floor transitions, and adhesives.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- B. Seaming Plan: Provide plan indicating boarders, patterns, and material color and model.
- C. Samples: Submit two (2) manufacturer's color charts or samples, illustrating sheet vinyl floor color options, for selection by Landmark. Selection shall be from manufacturers' standard options.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- B. Extra Material: Identify Owner's storage room location, and store extra material in original cartons.

1.4 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Include special installation instructions.
 - a. Indicate special procedures at perimeter conditions which require special attention and preparation of floor surfaces.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F. and achieve temperature stability.
 - a. Install materials at a temperature of 70 degrees F.
 - b. Thereafter, maintain conditions between 55 degrees F and 90 degrees F.
- C. Maintain ambient temperature required by adhesive manufacturer for three days prior to and one day after installation of material.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame / smoke rating requirements in accordance with ASTM – 84. (ASTM E648, critical flux at 0.45 watts per cm squared or more, class 1, ASTM E662, smoke at 450 or less)

1.7 EXTRA MATERIALS

- A. Provide a minimum of one (1) carton of each standard color floor tile used.
- B. Provide a minimum of 10’-0” for each 500 square feet of each sheet vinyl floor color.
- C. Provide a minimum of one piece 12’-0” long of each standard color base.
- D. Provide one (1) 4’-0” long piece of floor transition moldings in each color used.

PART 2 PRODUCTS

2.1 MATERIALS

- A. VCT-1-12: Resilient floor tile; shall be 12” x 12” x 1/8” vinyl composite tile, one (1) color throughout a suite or clinical department, in one of Landmarks standard six (6) colors or one (1) color with accent color. One of the following approved manufacturers and products may be used:
 - a. Armstrong “Imperial Texture, Standard Excelon” (www.armstrong.com)
 - b. Additional approved equal products shall be considered.
 - c. See Finish Schedule for more information.
- B. SV-1-16: Sheet vinyl flooring (no integral base); shall be flexible commercial PVC sheet flooring in 2.0 mm thickness of laminated construction including print film layer of 0.70 mm and backing ply of 1.23 mm. The flooring shall incorporate a specially formulated polyurethane reinforcement, to significantly reduce maintenance costs. One color shall be used throughout a suite or clinical department, in one of Landmarks standard six (6) colors.
 - a. Seam method shall be recess scribe with heat weld.
 - b. Adhesive and rod for heat welding seam shall be as recommended by manufacturer.
 - c. One of the following approved manufacturers and products may be used:
 - i. Armstrong, “Timberline” (www.armstrong.com)
 - ii. Armstrong, “Connection Corlon” (www.armstrong.com)
 - iii. Armstrong, “Possibilities Petit Point” (www.armstrong.com)
 - iv. Additional approved equal products shall be considered
 - v. See Finish Schedule for more information

- C. Sheet vinyl floor and integral base; shall be commercial vinyl-backed with no reverse pieces.
 - a. Seam method shall be recess scribe with heat weld.
 - b. Adhesive and rod for heat welding seam shall be as recommended by manufacturer.
 - c. Integral flash cove base by extending sheet flooring 4" up wall using adhesive, welding rod, and accessories as recommended by manufacturer.
 - i. Provide top edge trim caps of anodized aluminum for integral flash cove as approved by the Landmark.
 - ii. Provide a fillet support strip for integral cove base with a minimum radius of 1 in. of plastic.
 - d. Color of sheet vinyl floor, base and rod as selected by Landmark from manufacturer's standard options.
- D. VB-1: Vinyl base; shall be covered 4" high base, 1/8" thick, coil stock base, one (1) color throughout a suite or clinical department, in one of Landmarks standard six (6) colors. One of the following approved manufacturers and products may be used:
 - a. Roppe, "198 Ivory" (www.roppe.com)
 - b. Additional approved equal products shall be considered.
- E. VB-2: Vinyl base; shall be covered 4" high base, 1/8" thick, coil stock base, one (1) color throughout a suite or clinical department, in one of Landmarks standard six (6) colors. One of the following approved manufacturers and products may be used:
 - a. Roppe, "122 Natural" (www.roppe.com)
 - b. Additional approved equal products shall be considered.
- F. VB-3: Vinyl base; shall be covered 4" high base, 1/8" thick, coil stock base, one (1) color throughout a suite or clinical department, in one of Landmarks standard six (6) colors. One of the following approved manufacturers and products may be used:
 - a. Roppe, "191 Camel" (www.roppe.com)
 - b. Additional approved equal products shall be considered.
- G. VB-4: Vinyl base; shall be covered 4" high base, 1/8" thick, coil stock base, one (1) color throughout a suite or clinical department, in one of Landmarks standard six (6) colors. One of the following approved manufacturers and products may be used:
 - a. Roppe, "174 Smoke" (www.roppe.com)

- b. Additional approved equal products shall be considered.
- H. VB-5: Vinyl base; shall be covered 4” high base, 1/8” thick, coil stock base, one (1) color throughout a suite or clinical department, in one of Landmarks standard six (6) colors. One of the following approved manufacturers and products may be used:
- a. Roppe, “632 Flax” (www.roppe.com)
 - c. Additional approved equal products shall be considered.
- I. VB-6: Vinyl base; shall be covered 4” high base, 1/8” thick, coil stock base, one (1) color throughout a suite or clinical department, in one of Landmarks standard six (6) colors. One of the following approved manufacturers and products may be used:
- a. Roppe, “195 Light Gray” (www.roppe.com)
 - b. Additional approved equal products shall be considered.
- J. FTM-#: Floor Transition Moldings; shall be provide where resilient floor, sheet vinyl flooring, carpet and/or sealed concrete butts each other. Colors to be selected by Landmark. One of the following approved manufacturers and products may be used:
- a. Roppe, “Adapters, Transitions & Tracks” (www.roppe.com)
 - b. Additional approved equal products shall be considered.
 - c. See Finish Schedule for more information.

2.2 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.
- C. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces to receive new materials area suitable for application of material.
 - a. Verify concrete floors are dry to a maximum moisture content of 7 %, and exhibit negative alkalinity, carbonization, and dusting.
 - b. Verify concrete floors are dry to a maximum moisture emission rate of 3 pounds per 1000 square feet for sheet vinyl applications, 5 pounds per 1000 square feet for vinyl composite tile,

- B. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.
- C. Review project conditions against manufacturer's recommendations and consult with manufacture for proper methods and materials to suit specific or unusual conditions.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor low spots (1/8" in 10'-0"), cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- B. Floor substrates shall be feathered out with sub-floor filler so that adjacent ceramic and resilient finish floor surfaces are flush.
- C. Prohibit traffic until filler is cured.
- D. Clean substrate.
- E. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION - TILE FLOORING

- A. All tile of the same color shall be of the same color lot in one room, suite or area of the building. Install in accordance with manufacturer's instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place, press with heavy roller to attain full adhesion.
- E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern. Lay tile centered within rooms.
- F. Install tile to straight pattern. Center the in room with pattern parallel to the short dimension of room. Allow minimum 1/2 full size tile width at room or area perimeter.
- G. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- H. Resilient tile is not required beneath cabinets.
- I. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- J. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated

- K. Install flooring in recessed floor access covers. Maintain floor pattern.
- L. At movable partitions, install flooring under partitions without interrupting floor pattern.
- M. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION – SHEET VINYL FLOOR

- A. Install in accordance with manufacturer's instructions.
- B. Extend flooring into toe spaces, door recesses, closets, and similar openings as indicated on the Drawings.
- C. If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.
- D. Scribe, cut and fit or flash cover to permanent fixtures, columns, walls, cabinet base, partitions, pipes, outlets and other similar vertical surfaces.
- E. Adhere flooring to subfloor without cracks, voids, raising or puckering at the seams. Roll with 100 pound roller in the field areas. Hand roll flooring at the perimeter and the seams to assure adhesion.
- F. Lay floor to provide the minimum number of seams. Avoid cross seams, filler pieces, and strips. Match edges for color shading and pattern at the seams.

3.5 INSTALLATION – SHEET VINYL FLOOR AND INTEGRAL BASE

- A. Install in accordance with manufacturer's instructions.
- B. Extend flooring into toe spaces, door recesses, closets, and similar openings as indicated on the Drawings.
- C. If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.
- D. Scribe, cut and fit or flash cover to permanent fixtures, columns, walls, cabinet base, partitions, pipes, outlets and other similar vertical surfaces.
- E. Adhere flooring to subfloor without cracks, voids, raising or puckering at the seams. Roll with 100 pound roller in the field areas. Hand roll flooring at the perimeter and the seams to assure adhesion.
- F. Lay floor to provide the minimum number of seams. Avoid cross seams, filler pieces, and strips. Match edges for color shading and pattern at the seams.

- G. Prepare heat-welded seams with special routing tool supplied for this purpose and heat weld with vinyl welding rod in seams. Finish all seams flush and free from voids, recesses, and raised areas.
- H. Provide integral flash cove wall base including cove fillet support strip and top edge cap trim. Heat weld seams as specified for flooring.

3.6 INSTALLATION – VINYL BASE

- A. All base of the same color shall be of the same color lot in one suite or area of the building. Install in accordance with manufacturer's recommendations.
- B. Fit joints tightly and make vertical. Maintain minimum dimension of 24" between successive joints.
- C. Miter internal corners.
- D. External corners shall be job-formed with tool 'V' cut back of base strip to 1/2 of its thickness and folded. Insure base is adhering tightly to the wall at each side or the external corner. Joints in base shall occur at least 18" from an outside corner.
- E.. Install base on solid backing. Bond tightly to wall and floor surfaces.
- F. Scribe and fit to door frames and other interruptions.
- G. Provide base at base cabinet toe, kick, and sides.

3.7 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean, seal, and wax resilient flooring products in accordance with manufacturer's instructions.

3.8 PROTECTION OF FINISHED WORK

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END 09650

DIVISION 9 - FINISHES
Section 09680 - Carpeting

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Carpet flooring, backing material, integral carpet base, and adhesives.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- B. Carpet seaming layout plan and quantity take-off.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.4 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- B. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- C. Extra Material: Identify Owner's storage room location, and store extra material in original cartons.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements in accordance with ASTM E84.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Store materials in area of installation for 48 hours prior to installation.
- B. Maintain minimum 70 degrees F ambient temperature 3 days prior to, during and 24 hours after installation.
- C. Ventilate installation area during installation and for 3 days after installation.

1.7 WARRANTY

- A. Carpet: Manufacturer's written limited ten (10) year warranty

- B. iLocMB Backed Carpet: Manufacturer's lifetime warranties on wear, delamination, edge reveal, zipping, and static propensity below 3.5kv.

1.8 EXTRA MATERIALS

- A. Provide a minimum of one (1) large carpet scrap of each color and type used.
- B. Provide one (1) 4'-0" long piece of floor transition molding in each color used.
- C. Provide three (3) pieces of pre-cut carpet for use in each elevator cab (three pieces per cab). Pieces shall not cut from single role of carpet with not seams, if possible. Bind edges with yarn which matches the carpet color as closely as possible.

PART 2 PRODUCTS

2.1 MATERIALS

- A. CPT-1, CPT-5, CPT-9, CPT-13, CPT-17, & CPT-21: Carpet as indicated on the Drawings shall be 32 ounce Antron Legacy of nylon, Tufted Tip-Sheared, Piece Dyed. Backing material shall be High Performance PC for direct glue-down installation. One (1) color selected from Landmark's six (6) color schemes shall be used throughout one suite and /or clinic department.
 - a. Bentley Prince Street, "City Center" (www.bentleyprincestreet.com)
 - b. Additional approved equal products shall be considered.
- B. CPT-2, CPT-6, CPT-10, CPT-14, CPT-18, & CPT-22: Carpet as indicated on the Drawings shall be 34 ounce Antron Legacy of nylon, Tufted Tip-Sheared, Piece Dyed. Backing material shall be High Performance PC for direct glue-down installation. One (1) color selected from Landmark's six (6) color schemes shall be used throughout one suite and /or clinic department.
 - a. Bentley Prince Street, "Urban Scene" (www.bentleyprincestreet.com)
 - b. Additional approved equal products shall be considered.
- C. CPT-3, CPT-7, CPT-11, CPT-15, CPT-19, & CPT-23: Carpet shall be 32 ounce, Antron Legacy of nylon, Tufted Tip-Sheared, Piece Dyed. Backing material shall be High Performance PC for direct glue-down installation. One (1) color selected from Landmark's six (6) color schemes shall be used throughout one suite and/or clinic department.
 - a. Bentley Prince Street, "Urban Tribe" (www.bentleyprincestreet.com)
 - b. Additional approved equal products shall be considered.
- D. CPT-4, CPT-8, CPT-12, CPT-16, CPT-20, & CPT-24: Carpet as indicated on the Drawings shall be 30-ounce Antron Legacy of Nylon, Tufted Tip-Sheared, Piece Dyed. Backing material shall be High Performance PC for direct glue-down installation. One (1) color selected from Landmark's six (6) color schemes shall be used throughout one suite and /or

clinic department.

- a. Bentley Prince Street, “Blaze” (www.bentleyprincestreet.com)
 - b. Additional approved equal products shall be considered.
- E. Carpet base; shall be 4” high of the same material as the adjacent carpet. The exposed (upper) edge of the carpet base bound with yarn, which matches the carpet color as closely as possible.

2.2 ACCESSORIES

- A. Sub-Floor Filler: Cementitious Type recommended by flooring material manufacturer.
- B. Floor Transition Moldings; shall be provided where resilient floor, sheet vinyl flooring, carpet and/or sealed concrete butts each other. Colors to be selected by Landmark. One of the following approved manufacturers and products may be used:
 - a. Roppe, “Adapters, Transitions & Tracks” (www.roppe.com)
 - b. Additional approved equal products shall be considered.
- C. Seam Adhesive: Recommended by manufacturer.
- D. Contact Adhesive: Compatible with carpet material, recommended by carpet manufacturer. Adhesive shall comply with requirements for fire resistant installation and be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that floor surfaces are smooth and flat within tolerances and are ready to receive work.
- B. Verify that concrete floors are ready for carpet installation by testing for moisture emission rate and alkalinity. Obtain instructions if test results are not within specified limits.
 - a. Moisture emission rate: Not greater than 3 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
 - b. Alkalinity: pH range of 5-9.

3.2 PREPARATION

- A. Clean floor of dust, dirt, solvents, oil, grease, paint, plaster, and other substances detrimental to proper performance of adhesive and carpet. Allow floor to thoroughly dry.
- B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Maximum surface

variation of 1/8" in 10'-0", non-cumulative.

- D. Prohibit traffic until filler is cured.
- E. After cure, vacuum clean substrate.

3.3 INSTALLATION

- A. Install carpet in accordance with manufacturer's instructions.
- B. Verify carpet match before cutting to ensure minimal variation between dye lots.
- C. Lay out carpet:
 - a. Locate seams in area of least traffic, out of areas of pivoting traffic, parallel to main traffic, and to minimize the number of seams.
 - b. Do not locate seams perpendicular through door openings, entries or exits.
 - c. Seams shall be centered beneath doors when in the closed position.
 - d. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
 - e. Make seams run with traffic flow.
 - f. Locate change of color or pattern between rooms under door centerline.
 - g. Provide monolithic color, pattern, and texture match within any one area.
- D. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.
- E. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed.
- F. Same color in adjacent areas shall be laid with pattern and pile-lay running in the same direction.
- G. Carpeting of any one color shall first be installed in corridors and areas contiguous to the corridor and shall be protected, and then installed in individual rooms with doors to safeguard against carpet dye lot variations.
- H. Carpet shall be laid with pile-lay and / or pattern running perpendicular to corridor walls except in "L" shaped corridors where pile-lay and / or pattern running parallel to corridor walls in shortest leg of the "L".
- I. Apply contact adhesive primer to floor uniformly at rate recommended by manufacturer. Apply contact adhesive to floor, after primer, at a rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
- J. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

- K. Roll with appropriate roller for complete contact of adhesive to carpet backing.
- L. Extend carpet as base finish up vertical surfaces to form base. Terminate top of base bound with yarn which matches the carpet color as closely as possible.
- M. Complete installation of edge strips, concealing exposed edges. Bind cut edges where not concealed by edge strips.
- N. Carpet shall not be cut out for plumbing cleanouts.
- O. Carpet base shall be installed after carpet floor. Fit carpet base snugly to wall and provide full adherence.

3.4 INSTALLATION ON STAIRS

- A. Use one piece of carpet for each tread and the riser below. Apply seam adhesive to all cut edges.
- B. Install carpet with pile direction in the length of the stair.
- C. Adhere carpet tight to stair treads and risers.

3.5 INSTALLATION OF FLOOR TRANSITION MOLDING

- A. Coordinate the installation of floor transition molding with the resilient and ceramic tile floor installation.
- B. Anodized aluminum transition strips shall be installed at ceramic and porcelain tile floors, under section 09300 – Tile.
- C. Install resilient transition moldings at where carpet transitions to other floor finishes, and to concrete.
 - a. Install full length pieces at doors and other openings between rooms.
 - b. At door openings, install directly under door when closed.
 - c. Strips shall be butt tightly to vertical surfaces.
 - d. Where splices can not be avoided, ends shall be tight and flush.

3.6 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

3.7 PROTECTION OF FINISHED WORK

- A. Heavy objects such as furniture shall not be placed on carpeted surfaces for a minimum of twenty four (24) hours or until adhesive is set.

B. Protect finished work from damage.

END 09680

DIVISION 9 - FINISHES
Section 09720 - Wall Coverings

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Vinyl wall covering and adhesives.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on covering and adhesive.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.4 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.
- B. Extra Material: Identify Owner's storage room location and store extra material in original cartons.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke ratings of 25 and 50 when tested to UL 723 requirements.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or vinyl covering product manufacturer.
- B. Maintain these conditions 24 hours before, during, and after installation of adhesive and covering.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces when installing Work.

1.7 EXTRA MATERIALS

- A. A minimum of three (3) 8'-0" long pieces of each standard color vinyl wall covering used on the project.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. All materials shall be delivered to the job in original, new and unopened containers bearing the manufacturer's name and label showing name, Federal Specification number if applicable, manufacturer's stock number, manufacturer's name and application number
- B. Provide proper storage to prevent damage to and deterioration of materials.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Vinyl wall covering; as selected by tenant shall be one Class "A" fire rated, Type II, 21ounce minimum vinyl wall covering. One (1) color shall be used throughout the public areas. One of the following approved manufacturers and products may be used:
 - a. RJF International Corp. "Koroseal Aria 3321-42 Flax" (www.koroseal.com)
 - b. RJF International Corp. "Koroseal Interweave 3428-77 Sea Mist" (www.koroseal.com)
 - c. RJF International Corp. "Koroseal Sapporo 3715-20" (www.koroseal.com)
 - d. RJF International Corp. "Koroseal Savannah 4921-91" (www.koroseal.com)
 - e. RJF International Corp. "Koroseal Burlap 2126-91 Sterling" (www.koroseal.com)
 - f. RJF International Corp. "Koroseal Cello CP21-94" (www.koroseal.com)
 - g. Additional approved equal products shall be considered
- B. Adhesive; shall be Gardner – Gibson, Inc. "Shur-Stik 785" or Evans, or type recommended by covering manufacturer to suit application to substrate.
- C. Substrate Filler: As recommended by adhesive and covering manufacturer; compatible with substrate.
- D. Substrate Primer and Sealer: As specified in Section 09900 – Painting.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the covering manufacturer.
- B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply coverings unless moisture content of surface is below 12 percent for gypsum board.
- C. Verify flatness tolerance of surfaces does not vary more than 1/4" inch in 10'-0" nor vary at a rate greater than 1/16" in 1'-0".
- D. No felt-tip or ball point marks shall be made on walls scheduled to receive vinyl wall covering.

3.2 PREPARATION

- A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
- B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.
- C. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.
- E. Marks: Seal with shellac those which may bleed through surface finishes.
- F. Apply primer sealer to substrate surfaces as specified in Section 09900 - Painting. Allow to dry. Lightly sand smooth.
- G. Vacuum clean surfaces free of loose particles.

3.3 INSTALLATION

- A. Apply adhesive and covering in accordance with manufacturer's instructions.
- B. Apply adhesive to wall surface immediately prior to application of covering. Let contact adhesive set tack free.
- C. Use covering in roll number sequence.
- D. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
- E. Apply covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tight.
- F. Horizontal seams are not acceptable, unless approved by Landmark in advance.
- G. Do not seam within 2" of internal corners or within 6" of external corners.
- H. Install covering before installation of bases, cabinet hardware, or items attached to or spaced slightly from wall surface.
 - a. Do not install covering more than 1/4" below top of resilient base. Allow base to adhere directly to gypsum board substrate.
 - b. Install covering 2" below countertops at cabinets.
- I. Cover spaces above and below windows, above doors in sequence from roll.
- J. Terminate wall covering at inside corners when wall finish changes color or changes from vinyl to paint, unless noted otherwise on the Drawings.
- K. Carry through door and window openings and openings cut out after application, with no piecing at door heads and window heads, jambs, and sills.

- L. Apply covering to wall cleanouts, and access doors prior to replacing.
 - a. Do not cover electrical, telephone, data, and other similar cover plates.
 - b. Do not cover electrical panel doors and frames.
- M. Covering required behind radiation and convector covers.
- N. Where covering tucks into reveals, or metal wallboard or plaster stops, apply covering with contact adhesive within 6" of covering termination. Ensure full contact bond.
- O. Remove excess adhesive while wet from seam before proceeding to next covering sheet. Wipe clean with dry cloth.

3.4 CLEANING

- A. Clean coverings of excess adhesive, dust, dirt, and other contaminants.
- B. Reinstall wall plates and accessories removed prior to work of this section.

END 09720

DIVISION 9 - FINISHES
Section 09900 - Painting

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Painting of gypsum drywall, ferrous materials, and other miscellaneous materials which require paint.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on all finishing products.
- B. Paint out samples (6" x 8") in triplicate for each color used.
- C. Elastomeric finish color selection in triplicate.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Instructions: Indicate special surface preparation procedures, and substrate conditions requiring special attention.

1.4 SUBMITTALS AT PROJECT CLOSEOUT

- A. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.
- B. Extra Material: Identify Owner's storage room location and store extra material in original cartons.

1.5 QUALITY ASSURANCE

- A. Primers, stains, sealers, and finish coats shall be by the same manufacturer, and shall be top of the line, consumer grade.
- B. Paint materials shall comply with Volatile Organic Compound regulations, current where the project is located.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions. Do not apply paint when relative humidity exceeds 85%, unless otherwise permitted by manufacturer's printed instructions.

- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface when installing Work.

1.7 EXTRA MATERIALS

- A. Extra Stock Material: A minimum of one (1) gallon of each standard paint color used on the interior of the project. Shall be left stored at the job site for touch-up.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Materials shall be delivered to the job in original, new and unopened containers with labels showing name, Federal Specification number if applicable, manufacturer's stock number, manufacturer's name, and application instructions.
- B. Provide proper storage to prevent damage to and deterioration of materials.

PART 2 PRODUCTS

2.1 PAINT MANUFACTURERS

- A. Paint Material and Manufacturers; Primers, stains, sealers, and finish coat material shall comply with Volatile Organic Compound regulations, current where the project is located. One of the following approved manufacturers may be used:
 - a. Pratt & Lambert (www.prattandlambert.com)
 - b. Benjamin Moore (www.benjaminmoore.com)
 - c. Pittsburgh, PPG Industries (www.ppg.com)
 - d. Sherwin Williams (www.sherwin-williams.com)
 - e. Additional approved equal manufacturers shall be considered.

2.2 ACCESSORIES

- A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- B. Patching Materials: Latex filler.

2.3 PAINT FINISHES

- A. PT-1: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
 - a. Benjamin Moore Color Preview, "OC-2 Pale Almond" (www.benjaminmoore.com)

- b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered
- B. PT-2: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Sherwin Williams, SW Color, “6081 Down Home” (www.sherwin-williams.com)
 - b. Benjamin Moore, “Approved Equal” (www.benjaminmoore.com)
 - c. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - d. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - e. Additional approved equal products shall be considered
- C. PT-3: Interior exposed metal surfaces; including metal stairs and railing, hollow metal door and window frames, metal doors, ladders, and miscellaneous metal trim, shall, in addition to any factory prime coat, receive one coat of metal primer and one coat of satin enamel.
- a. Sherwin Williams, SW Color, “6101 Sands of Time” (www.sherwin-williams.com)
 - b. Benjamin Moore, “Approved Equal” (www.benjaminmoore.com)
 - c. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - d. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - e. Additional approved equal products shall be considered.
- D. PT-4: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin Moore Color Preview, “OC-7 Creamy White” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)

- e. Additional approved equal products shall be considered
- E. PT-5: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin Moore Color Preview, “HC-113 Louisburg Green” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- F. PT-6: Interior exposed metal surfaces; including metal stairs and railing, hollow metal door and window frames, metal doors, ladders and miscellaneous metal trim, shall, in addition to any factory prime coat, receive one coat of metal primer and one coat of satin enamel.
- a. Benjamin Moore Color Preview, “HC-83 Grant Beige” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- G. PT-7: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin Moore Classic Colors, “1037 Muslin” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- H. PT-8: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive

one coat of latex satin enamel. One of the following approved manufacturers and products may be used:

- a. Benjamin Moore Classic Colors, “1035 Cambridge Riverbed” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- I. PT-9: Interior exposed metal surfaces; including metal stairs and railing, hollow metal door and window frames, metal doors, ladders and miscellaneous metal trim, shall, in addition to any factory prime coat, receive one coat of metal primer and one coat of satin enamel.
- a. Benjamin Moore Classic Colors, “998 Cabot Trail” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- J. PT-10: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin Moore Classic Colors, “1471 Shoreline” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- K. PT-11: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:

- a. Benjamin Moore Classic Colors, “1545 Iron Gate” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- L. PT-12: Interior exposed metal surfaces; including metal stairs and railing, hollow metal door and window frames, metal doors, ladders, and miscellaneous metal trim, shall, in addition to any factory prime coat, receive one coat of metal primer and one coat of satin enamel.
- a. Benjamin Moore Classic Colors, “1474 Cape May Cobblestone” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- M. PT-13: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin Moore Classic Colors, “984 Stone Hearth” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- N. PT-14: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin Moore Classic Colors, “1078 Hillcrest Tan” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)

- c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- O. PT-15: Interior exposed metal surfaces; including metal stairs and railing, hollow metal door and window frames, metal doors, ladders, and miscellaneous metal trim, shall, in addition to any factory prime coat, receive one coat of metal primer and one coat of satin enamel.
- a. Sherwin Williams SW Color, “6143 Basket Beige” (www.sherwin-williams.com)
 - b. Benjamin Moore, “Approved Equal” (www.benjaminmoore.com)
 - c. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - d. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - e. Additional approved equal products shall be considered.
- P. PT-16: Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin Moore Color Preview, “OC-56 Moonshine” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.
- Q. PT-17 : Gypsum drywall partitions; not indicated to receive vinyl wall covering on the Drawings shall be primed with a white polyvinyl acrylic primer and, in addition, shall receive one coat of latex satin enamel. One of the following approved manufacturers and products may be used:
- a. Benjamin More Color Preview, “HC-162 Brewster Gray” (www.benjaminmoore.com)
 - b. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - c. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - d. Sherwin Williams, “Approved Equal” (www.sherwin-williams.com)
 - e. Additional approved equal products shall be considered.

- R. PT-18: Interior exposed metal surfaces; including metal stairs and railing, hollow metal door and window frames, metal doors, ladders, and miscellaneous metal trim, shall, in addition to any factory prime coat, receive one coat of metal primer and one coat of satin enamel.
 - a. Sherwin Williams SW Color, “7017 Dorian Gray” (www.sherwin-williams.com)
 - b. Benjamin Moore, “Approved Equal” (www.benjaminmoore.com)
 - c. Pittsburgh, PPG Industries, “Approved Equal” (www.ppg.com)
 - d. Pratt & Lambert, “Approved Equal” (www.prattandlambert.com)
 - e. Additional approved equal products shall be considered.
- S. Flush mounted electrical panels; not in equipment rooms or electric rooms shall receive two coats of paint to match adjacent finished surfaces.
- T. Access doors; installed in painted walls and ceilings shall received two coats of paint to match the adjacent finish surface, unless room is scheduled to receive wall covering. Refer to Section 09720 – Wall Covering for additional information.
- U. Millwork, wood, and trim surfaces; scheduled to be painted, shall receive one coat of primer and two finish coats of satin enamel.
 - a. One color throughout shall be used for millwork and trim. Color shall be selected by Landmark.
- V. Concrete and concrete block exposed to the interior in finished areas such as stairs, and other public areas shall receive one coat filler-primer and one coat latex satin enamel.
 - a. One color throughout shall be used for millwork and trim. Color shall be selected by Landmark.
- W. Gypsum drywall partitions; indicated to receive vinyl wall covering on Drawings shall be primed with a white polyvinyl acrylic primer.
- X. Mechanical and equipment room; gypsum board walls shall be painted with one prime coat. Paint shall extend to floor.
- Y. Plywood telephone backboards; shall receive one coat of paint if installed in equipment rooms, and two coats of paint if installed in finished areas to match the adjacent finish surface.

2.4 STAIN FINISHES

- A. Millwork, wood, and trim surfaces scheduled to be stained; shall receive one coat wood stain, one coat gloss varnish, and one coat satin varnish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces, and substrate conditions are ready to receive Work as instructed by the product manufacturer. Report any condition that may potentially affect proper application.
- B. Test shop applied primer for compatibility with subsequent cover materials.
- C. All exposed steel and field welds shall be inspected. Rust shall be removed. Welds shall be ground smooth. Galvanized surfaces shall be repaired with field applied cold galvanization. Primed surfaces shall repaired and epoxy primed to match factory applied primer.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - a. Plaster and Gypsum Wallboard: 12 percent.
 - b. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 - c. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2 PREPARATION

- A. Sequence application to the following:
 - a. Do not apply finish coats until paintable sealant is applied.
 - b. Back prime wood trim before installation of trim.
- B. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- C. Surfaces:
 - a. Correct defects and clean surfaces which affect work of this section.
 - b. Remove or repair existing coatings that exhibit surface defects.
 - c. Clean dirt, grease, chalk, and other contaminants, and insure surface is dry prior to receiving paint.
 - d. Fill or repair cracks, gouges, or other imperfections with putty or in other manner appropriate to the surface.
- D. Marks: Seal with shellac those which may bleed through surface finishes.
- E. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

- G. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- H. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by power tool, wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
- I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. [Prime metal items including shop primed items.]
- J. Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
- K. Interior Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats.
- L. Metal Doors Scheduled for Painting: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. All paint, varnish, and other materials shall be stirred before application to produce a mixture of uniform density and as required during the application of materials. Any film which may form on the surface shall not be stirred into the material.
- C. Paint all exposed ferrous materials not factory pre-finished with two coats of appropriate paint.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- F. Paint shall completely cover surfaces without drips, sags, holidays or excessive brush marks and shall present an even uniform finished final appearance.
- G. Sand wood and metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

- J. Prime concealed surfaces of interior and exterior woodwork with primer paint.
- K. Prime concealed surfaces of interior wood surfaces scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with thinner.
- L. Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in the first coat to assure a finish coat with no burn-through or other defects due to insufficient sealing.

3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Paint shop primed equipment. Paint shop finished items occurring at interior areas exposed to view.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are shop finished.
- D. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces. Paint dampers exposed behind louvers, grilles, [and convector and baseboard cabinets] to match face panels.
- E. Paint exposed conduit and electrical equipment occurring in finished areas.
- F. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.5 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

END 09900

DIVISION 10 – SPECIALTIES
Section 10150 –Compartments and Cubicles

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cubical curtain track and toilet partitions including fasteners and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of supports, and door swings.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Samples: Submit three samples of partition panel standard color selections.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Steel Sheet: ASTM A653/A653M, with zinc coating.
- B. Stainless Steel Sheet: ASTM A167, Type 304.

2.2 CURTAIN TRACK

- A. Curtain Track: "I" beam design, 1" x 1 3/8" with 3/4" running surfaces, splice plates, and end caps with electrostatic white paint finish on aluminum parts. Ceiling mounted track shall be anchored through ceiling tile to blocking above ceiling or to suspension system. All curved curtain tracks shall be factory bent to a minimum 12" radius. Provide nylon rollers that accurately fit track. Provide one carrier for each 6" of fabric width. Fabric shall be provided by tenant, and is not in the contract. One of the following approved manufacturers and products may be used:
 - a. A.R. Nelson, "Arnco Model #1200" track complete with #11 glide carriers with hook and #1206 end stop (www.arnelson.com)
 - b. Additional approved equal products shall be considered.

2.3 TOILET PARTITIONS

- B. Toilet Partitions: Toilet partitions shall be floor mounted, flush construction with baked

enamel finish, color as selected by Landmark. Hardware shall be manufacturer's standard with exterior access latch, coat hook mounted on door and roll toilet paper dispenser mounted on partition panel. Pilaster shoe shall be formed chromed steel with satin finish 3" high with concealed fastenings. One of the following approved manufacturers and products may be used:

- a. Crane Plumbing, Sanymetal, "Academy" (www.sanymetal.com)
- b. Mills, "Series 400 baked enamel" (www.millspartitions.com)
- c. Additional approved equal products shall be considered.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated on shop drawings and Drawings.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.2 INSTALLATION – CURTAIN TRACK

- A. Install track secure, rigid and true to ceiling or partition line in accordance with manufacturer's instructions.
- B. Install end caps and stop device.
- C. Secure track to ceiling system.

3.3 INSTALLATION - TOILET PARTITIONS

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 1/2" space between wall and panels and between wall and end pilasters.
- C. Attached panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets.
- E. Field touch-up of scratches or damaged enamel finish will not be permitted. Replace damaged or scratched materials with new materials.

3.4 ERECTION TOLERANCES

- A. Maximum Variation From True Position: 1/4".

B. Maximum Variation From Plumb: 1/4".

3.3 CLEANING AND ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16".
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.
- D. Clean partitions and protect from damage.

END 10150

DIVISION 10 - SPECIALTIES
Section 10200 - Metal Louvers

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal louvers, fasteners, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

1.3 SUBMITAL FOR PROJECT CLOSEOUT

- A. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 WARRANTY

- A. Provide twenty year manufacturer's warranty.
- B. Warranty: Include coverage for degradation of finish.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Louvers for building wall; shall be extruded aluminum, 4" deep, 0.050" minimum thickness, storm proof, drainable, and stationary blades, with a minimum net free area of 55%. Provide 1/2" aluminum finished bird screen mesh. Louver finish shall be manufacturer's standard Kynar 500 in a color selected by Landmark. One of the following approved manufacturers and products may be used:
 - a. Airolite, "K609HP", (www.airolite.com)
 - b. Construction Specialties, "GS407" (www.cs.com)
 - c. Ruskin, "ELF 375DX" (www.ruskin.com)
 - d. Additional approved equal products shall be considered.
- B. Louvers for mechanical screen wall; shall be extruded aluminum, 1 1/2" deep, 0.50" minimum thickness, 48 degree pitch, continuous louver, vertically reinforced at 24" o.c.

Louvers and reinforcing shall be manufacturer's standard baked enamel paint finish. Include accessories for a complete installation including metal cap, fasteners, support framing in addition to that shown on Drawings. One of the following approved manufacturers and products may be used:

- a. AiroLite, "AC 420", (www.airolite.com)
- b. Construction Specialties, "1320" (www.c-sgroup.com)
- c. Additional approved equal products shall be considered

2.2 ACCESSORIES

- A. Fasteners and Anchors: Galvanized steel type.
- B. Primer: Manufacturer's standard primer.
- C. Flashings: Sheet aluminum, type specified in Section 07600 Flashing and Sheet Metal.
- D. Sealants: Type specified in Section 07900 – Caulk and Sealant.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 COORDINATION

- A. Coordinate the Work with installation of mechanical ductwork

3.3 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- D. Secure louvers in opening framing with concealed fasteners.
- E. Install screen and frame to interior of louver.
- F. Install perimeter sealant and backing rod in accordance with Section 07900 – Caulk and Sealant.

3.3 CLEANING

A. Strip protective finish coverings.

B. Clean surfaces and components.

END 10200

DIVISION 10 - SPECIALTIES
Section 10260 – Wall Protection Systems

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Handrails, wall covering protection, corner guards, end guards, bumper rail, door skin and frame protection including fasteners, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
- B. Samples: Submit two (2) manufacturer's color charts or samples, illustrating color and finish options, for selection by Landmark. Selection shall be from manufacturers' standard options.

1.3 SUBMITTAL FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI A117.1 requirements for the physically handicapped.
- B. Performance Requirements:
 - a. Installed Wall Rail Component Assembly: Support vertical live load of 100 lb/lineal ft with deflection not to exceed 1/50 of span between supports.
 - b. Installed Component Assembly: Resist lateral force of 75 lbs at any point without damage or permanent set.
 - c. Corner Guards: Resist lateral impact force of 100 lbs at any point without damage or permanent set.

PART 2 PRODUCTS

2.1 COMPONENTS

- A. Handrails; shall have 1 1/2" wood top, vinyl body, and aluminum anchor. Color and finish shall be manufacturer's standard as selected by Landmark. One of the following approved manufacturers and products may be used:
 - a. Pawling Corporation, "BR-400CR", (www.pawling.com)

- b. InPro Corporation, “3000W” (www.inprocorp.com)
 - c. Construction Specialties, ” (www.c-sgroup.com)
 - d. Additional approved equal products shall be considered.
- B. Wall Covering Protection; shall be 0.030” vinyl, surface mounted with manufacturers standard sealant, 3’-0” high, continuous roll stock wall cover protection with manufacturers standard top, end, joint, inside, and outside corner moldings. Color and finish shall be manufacturer’s standard as selected by Landmark. One of the following approved manufacturers and products may be used:
- a. Pawling Corporation, “WC-30”, (www.pawling.com)
 - b. InPro Corporation, “Sanparrel 404” (www.inprocorp.com)
 - c. Construction Specialties, ” (www.c-sgroup.com)
 - d. Additional approved equal products shall be considered.
- C. Corner Guards (CG-1); shall be 0.085 vinyl, surface mounted with aluminum retainer, 2” wing, x 8’-0” high corner guards with manufacturers standard closure caps. Provide Color and finish shall be manufacturer’s standard as selected by Landmark. One of the following approved manufacturers and products may be used:
- a. Pawling Corporation, “BR-400CR”, (www.pawling.com)
 - b. InPro Corporation, “N160” (www.inprocorp.com)
 - c. Construction Specialties, “SM-20” (www.c-sgroup.com)
 - d. Alternate “Sustainable” Product: InPro Corporation, “IPC ENV ROgt G160” GT Series” (www.inprocorp.com)
 - d. Additional approved equal products shall be considered.
- D. Corner Guards (CG-2); shall be 0.060 vinyl, surface mounted with self adhesive tape backing, 3/4” wings, corner guards to start above base material and run to underside of finish ceiling. Color and finish shall be manufacturer’s standard as selected by Landmark. One of the following approved manufacturers and products may be used:
- a. Construction Specialties, “VA-034” (www.c-sgroup.com)
 - b. Additional approved equal products shall be considered.
- E. Door and Frame Protection; shall be sheet vinyl cladding (skins) 0.040” thickness, mounted at 34” above finished floor (match crashrail height), face apply to 1” of door edges with adhesive (double sided tape is not permitted). Coordinate with door hardware mounting

height. One of the following approved manufacturers and products may be used:

- a. Construction Specialties, "High Impact Sheeting" (www.c-sgroup.com)
- b. Pawling Corporation, "approved equal product" (www.pawling.com)
- c. InPro Corporation, "approved equal product" (www.inprocorp.com)
- d. Additional approved equal products shall be considered.

F. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

2.2 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that rough-in for components are correctly sized and located.
- B. Coordinate the work with wall or partition sections for installation of concealed blocking or anchor devices.
- C. Coordinate installation of vinyl fabric wall covering with corner guard frame and cover.

3.2 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
- B. Position top of bumper rail 1'-0" from finished floor, unless noted otherwise on the Drawings.
- C. Position top of corridor hand rail 2'-10" from finished floor, unless noted otherwise on the Drawings.
- D. Position corner guard 4" above finished floor, unless noted otherwise on the Drawings.
- E. Terminate handrails 2" short of door openings and intersecting walls.
- F. Return handrails to wall to be 1/2" clear of wall.

3.3 ERECTION TOLERANCES - HORIZONTAL RAILS

A. Maximum Variation From Required Height: 1/4".

B. Maximum Variation From Level or Plane For Visible Length: 1/4" .

END 10260.

DIVISION 10 - SPECIALTIES
Section 10400 – Identifying Devices

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Chart holders, building directories, interior room signage, exterior building lettering, exterior monument signage, and exterior traffic signage.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign.
- B. Interior signage color samples for selection by Landmark.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Include installation template and attachment devices.

1.4 SUBMITTAL FOR PROJECT CLOSEOUT

- A. Keys: Directory keys delivered to Landmark.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code, and ANSI A117.1 for requirements for the physically handicapped.
- B. Conform to applicable building code for emergency vehicle access, for paint finish and marking on traffic signs.
- C. Conform to Americans with Disabilities Act (ADA).

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install signs when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 INTERIOR BUILDING SIGNAGE

- A. Interior Signage: shall be framed, and surface mounted. Lettering shall be subsurface imprinted with back applied plaque color on clear semi-matte finish acrylic. One of the followings approved equal manufacturers and products may be used:

- a. APCO, “Accord 15” (www.apcosigns.com)
 - b. ASI - Modulex, “Infinity” (www.asimodulex.com)
 - c. Seton, “Evolve Architectural Sign Systems” (www.seton.com)
 - d. Additional approved equal product shall be considered.
- B. ADA 1990-28 CFR Part 36 required tactile lettering and Braille shall be provided on all signs except directional, elevator emergency instruction and two-way communication signs and suite plaque inserts.
- a. Pictograms shall be provided where required by building code and shall include the International Symbol of Accessibility.
 - b. Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The vertical space (background) allowed for a pictogram shall be a minimum of 6” in height. No Braille or text shall be placed within the 6” high vertical space allotted for the pictogram.
- C. Signage shall be mounted on the wall centered at 60” A.F.F. directly adjacent to the latch side of the door where applicable. Signage colors shall be selected by Landmark. Signs shall be provided where required to satisfy ADA and as follows:
- a. 9” x 6” minimum plaque for each public toilet room with International Handicapped Symbol of Accessibility.
 - b. 9” x 6” minimum plaque for each accessible building entry (if required by building code) with International Symbol of Accessibility.
 - c. 6” x 18” minimum directional plaque for each floor by the elevator.
 - d. Two (2) 6” x 6” minimum plaques for each egress stair door; identification of “Stair” on the exterior of the stair door, floor number on the interior of the stair door.
 - e. Two (2) plaques at each area of rescue assistance; 10” x 10” identification with international handicapped symbol and 10” x 10” two-way communication system emergency instructions.
 - f. 6” x 6” emergency instruction sign at each elevator location at each floor except the ground floor.
 - g. 10” x 10” minimum plaque for each suite up to 3,000 square feet; two (2) 10” x 10” minimum plaques for suites larger than 3,000 square feet; with interchangeable inserts to match the sign lettering and color.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION – INTERIOR BUILDING SIGNS

- A. Install in accordance with manufacturer's instructions.
- B. Install signs after doors, and surfaces are finished, in locations indicated on the Drawings.
 - a. If sign location is not provided on the Drawings, position sign 12” from strike side of door; on adjacent wall surface.
- C. Mount signage on the wall centered at 5’-0” above finish floor, directly adjacent latch side of the door where applicable.

END 10400

DIVISION 10 - SPECIALTIES
Section 10520 - Fire Extinguishers, Cabinets, and Accessories

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire extinguishers, fire extinguisher cabinets, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, and wall bracket mounted measurements.
- B. Product Data: Provide extinguisher operational features, color and finish, and anchorage details.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

1.4 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.5 QUALITY ASSURANCE

- A. Conform to NFPA 10, and applicable building code.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.1 MATERIALS AND PRODUCTS

- A. Fire Extinguisher; shall be Multi-purpose dry chemical fire extinguisher, with UL rating of 4A-60BC, 10lb. One of the following approved manufacturers and products may be used
 - a. Larsen, "MP Series" (www.larsenmfg.com)

- b. J.L. Industries, “Cosmic” (www.jlindustries.com)
 - c. Additional approved equal products shall be considered
- B. Extinguishers shall be inspected and tagged by the appropriate local authority.

2.2 FIRE EXTINGUISHER CABINETS

- A. Medical Office Building Fire Extinguishers Cabinet (Non-rated wall); shall be aluminum tub, mill finish cabinet with vertical white door with black type A letters. One of the following approved manufacturers and products may be used:
- a. J.L. Industries, “Semi-recessed Panorama 1027 P42” (www.jlindustries.com)
 - b. Larsen, “Semi-recessed AL-G-2409” (www.larsenmfg.com)
 - c. Additional approved equal products shall be considered
- B. Medical Office Building Fire Extinguishers Cabinet (Fire rated wall); shall be aluminum tub, mill finish cabinet with vertical white door with black type A letters. One of the following approved manufacturers and products may be used:
- a. J.L. Industries, “Semi-recessed Panorama 1027 P42 Fire-FX” (for fire rated wall locations) (www.jlindustries.com)
 - b. Larsen, “Semi-recessed AL-G-2409 with Flame Shield Option” (www.larsenmfg.com)
 - c. Additional approved equal products shall be considered

2.3 ACCESSORIES

- A. Fire Extinguisher Wall Bracket; shall be fire extinguisher manufacturers standard wall hung bracket. One of the following approved manufacturers and products may be used:
- a. Larsen, “MB 845”
 - b. J.L. Industries, “Mark Series III”
 - c. Additional approved equal products shall be considered

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify rough openings for cabinet are correctly sized and located.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install fire rate cabinets in fire rated partitions and non-fire rated cabinets in non-rated partitions.
- C. Install top of cabinet at 54" from finished floor, unless noted otherwise on the Drawings.
- D. Install cabinets and wall brackets plumb and level in wall openings, and as indicated on the Drawings.
- E. Secure rigidly in place.
- F. Place extinguishers in cabinets, or on wall brackets as indicated on the Drawings.

3.3 ADJUSTING AND CLEANING

- A. Marred cabinet finishes shall be touched-up using only materials and finishes as recommended or furnished by cabinet manufacturer.
- B. Doors and latches shall be adjusted and oiled to operate easily without bind.
- C. Clean cabinet interiors and exterior surfaces.

END 10520.

DIVISION 10 - SPECIALTIES
Section 10810 - Toilet Accessories

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Toilet room accessories include coat hooks, grab bars, toilet paper holders, mirrors, towel dispensers, soap dispensers, specimen pass-thrus, shower seats, and shower curtain rod.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on accessories describing size, finish, details of function, and attachment methods.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, and conditions requiring special attention.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and ANSI A117.1 for requirements for the physically handicapped for provisions for the disabled.

PART 2 PRODUCTS

2.1 TOILET ROOM ACCESSORIES

- A. Toilet Room Accessories: All accessories shall be stainless steel, satin finish, installed at height to meet ADA requirements.
 - a. TA-1 Coat Hooks: Bobrick, "Classic Series Model # B-6727"
 - b. TA-2 Soap Dispenser: Bradley Corporation, "Model # 6562", (www.bradleycorp.com/)
 - c. TA-3 Toilet Tissue Dispenser (All Public Toilets): Bobrick, "Contura Series Model # B-4288"
 - d. TA-4 Toilet Room Mirrors (All Tenant Suites): Bobrick " Model # B-165 1836"

- e. TA-5 Toilet Room Mirrors (All Public Toilets):
Ambiance by Parker “Frame # 80419”.
First Floor - 54” x 38” - All floors except the 1st - 30”x 42”
(www.ambianceart.com/)
 - f. TA-6 Recessed Paper Towel Dispenser and Waste Receptacle (1st Floor Public Toilets Only): Bobrick, “Contura Series Model # B-43944”
 - g. TA-7 Recessed Paper Towel Dispenser and Waste Receptacle (All Public Toilets except the 1st Floor): Bobrick, “Contura Series Model # B-4369”
 - h. TA-8 Sanitary Napkin Disposal (All Women’s Public Toilets):
Bobrick, “Contura Series Model # B-4354”
 - i. TA-9 Polypropylene Baby Changing Station (Tenant Suites): Koala Kare,
“Model # KB-200-XX”, (www.koalabear.com/). Final finish selection to
be verified by owner/architect from manufacturers standard color options.
 - j. TA-10 Toilet Tissue Dispenser (All Tenant Suites): Bobrick, “Model # B-2888”
 - k. TA-11 Paper Towel Dispenser (All Tenant Suites): Bobrick, “Classic Series
Model # B-262”
 - l. TA-12 Sanitary Napkin Disposal (All Women’s and Unisex Suite Toilets):
Bobrick, “Contura Series Model # B-270”
 - m. TA-13 Specimen Pass-thru Cabinet: Carr Corporation, “SPT-12” Provide
extension flange, if required
- B. Toilet Grab Bars: All grab bars shall be stainless steel, satin finish, installed at height to meet ADA requirements, and shall be 1 1/2" outside diameter, with 1 1/2" clearance between bar and wall grab bars.

	<u>Bobrick #</u> (www.bobrick.com)	<u>American Spec. #</u> (www.americanspecialties.com)
a. TA-14 Side Wall Mounted and Partition Mount as Required by Code	B-6806	3200 series

C. Shower Accessories: All shower accessories shall be stainless steel, satin finish, installed at height to meet ADA requirements.

	<u>Bobrick #</u> www.bobrick.com	<u>American Spec. #</u> www.americanspecialties.com
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a. TA-14 Wall Mounted Grab Bars: as Required by Code	B-6806	3200 series
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b. TA-15 Folding Shower Seats:	B-517 (right hand)	8205
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D. Utility Room Accessories: All utility room or janitor closets accessories shall be stainless steel, satin finish, installed at height to meet ADA requirements.

a. TA-16 Utility Shelf with Mop and Broom Holder: Bobrick, "Model # B-239"

2.2 ACCESSORIES

A. Adhesive: Two component epoxy type, or contact type, waterproof.

B. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof.

C. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify exact location of accessories for installation.

B. Verify that field measurements are as indicated on product data and the Drawings

3.2 PREPARATION

A. Coordinate the work with the placement of internal wall reinforcement, and blocking to receive anchor attachments.

B. Deliver inserts and rough-in frames to site for timely installation.

C. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Carefully fit accessories abutting other components with hairline seams, and with maximum gaps of 1/32".
 - a. Where contractor is unable to achieve a hairline seam, provide sealant in joints in color to match adjacent finish surface.
- D. Mounting Heights and Locations: As required by accessibility regulations, and as indicated on the Drawings.

END 10810

DIVISION 12 - FURNISHINGS
Section 12490 – Window Treatment

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum mini-blinds including slats, rails, cords, hardware, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.
- B. Product Data: Provide data indicating physical and dimensional characteristics, and operating features.
- C. Color samples for selection by Landmark.

1.3 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.4 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Extra Material: Identify Owner's storage room location and store extra material in original cartons.

1.5 EXTRA MATERIALS

- A. Provide ten additional slats.
- B. Provide two additional complete blind assemblies of each size.

PART 2 PRODUCTS

2.1 BLINDS AND BLIND COMPONENTS

- A. 1" aluminum slats and rails with baked enamel finish matching window frame color as closely as possible.
- B. Braided polyester dacron ladders and lift cords with rayon core and braided dacron polyester jacket. Lifting, tilting and locking hardware and molded plastic headrail end caps.
- C. One of the following approved manufacturers and products may be used:
 - a. Hunter Douglas, "Celebrity" (www.hunterdouglas.com)

- b. Levolor, "Monaco 6" (www.levolor.com)
- c. Springs Industries, "Bali LightBlocker" (www.baliblinds.com)
- d. Kirsch, "Basic 8 Privacy 1" (www.kirsch.com)
- e. Additional approved equal products shall be considered.

2.2 FABRICATION

- A. Fabricate blinds to fit within openings with uniform edge clearance of 1/4". Install within window frames, and do not cover.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that openings are ready to receive the work.
- B. Ensure structural blocking and supports are correctly placed.

3.2 COORDINATION

- A. Coordinate the work with window installation and placement of concealed blocking to support blinds.

3.3 INSTALLATION

- A. Install blinds in accordance with manufacturer's instructions.
- B. Secure in place with concealed fasteners.
- C. Place intermediate head supports at spacing recommended by manufacturer.

3.4 INSTALLATION TOLERANCES

- A. Maximum Variation of Gap at Window Opening Perimeter: 1/4".
- B. Maximum Offset from Level: 1/4".

3.5 ADJUSTING

- A. Adjust blinds for smooth operation.

3.6 CLEANING

- A. Clean blind surfaces just prior to occupancy.

END 12490

DIVISION 15 - MECHANICAL
Section 15300- Basic Fire Protection Requirements

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire protection system basic requirements

1.2 BASIC FIRE PROTECTION REQUIREMENTS

- A. Fire Protection – Medical Office Building: The fire protection system shall be a NFPA-13 and NFPA-14 complying system including a wet automatic fire sprinkler system, a pre-action fire sprinkler system, a fire pump, and a stand pipe.
- a. The work shall incorporate a complete design / build approach including the engineering, development of working drawings for the engineered contract documents, permits, approvals, computer hydraulic design calculations, inspections and system performance testing in accordance with state and local governing authority requirements.
 - b. The fire protection system shall incorporate conveniences for maintenance and future remodeling.
 - c. The fire protection system shall comply with all state and local codes.
 - d. Service shall be fed with an 8” line from a city main. Refer to the Drawings for additional details.
 - e. System shall be zoned by floor.
- B. Fire Protection – Parking Structure: The fire protection system shall be a NFPA-13 and NFPA-14 complying system including a dry pipe / valve automatic fire sprinkler system, a fire pump, and a stand pipe.
- a. The work shall incorporate a complete design / build approach including the engineering, development of working drawings for the engineered contract documents, permits, approvals, computer hydraulic design calculations, inspections and system performance testing in accordance with state and local governing authority requirements.
 - b. The fire protection system shall incorporate conveniences for maintenance and future remodeling.
 - c. The fire protection system shall comply with all state and local codes.
 - d. Service shall be fed with an 8” line from a city main. Refer to the Drawings for additional details.
 - e. System shall be zoned by level.

- f. Sprinkler and standpipe piping in Parking Structure shall be galvanized due to exposure to outside weather conditions.

1.3 PRE-ACTION FIRE PROTECTION REQUIREMENTS

- A. Pre-Action sprinkler system valve shall be provided in a tenant suite if required by the tenant's medical equipment or operation.
- B. Pre-Action sprinkler system shall be single-interlocked dry system and shall include all required accessories for a complete and operational pre-action sprinkler system. System shall include (but not limited to) pressure operated relief valve, low air compressor (with air supervisory switch), smoke detectors and solenoid valve.
 - a. The pre-action valve shall activate (release water to sprinkler piping downstream of valve) with BOTH of the following:
 - i. The electrical detection system (smoke and / or head detector) trips the solenoid valve through the control panel.
 - ii. Opening one or more of the automatic sprinkler heads attached to the system, which opens the actuator.
 - b. Locate the compressor, riser and valve in Mechanical Room
 - c. Dry Valve: Dry pipe valve complete with cast iron body and cover, latching valve and clapper. Unit shall have trim piping for alarm test by-pass, air supply, priming gauge, and drain connections. Provide mechanical or pneumatic switches to indicate system trouble; when the dry pipe air pressure has fallen below the air maintenance regulator set-point; system activation; when the dry pipe valve has tripped and water is flowing in the system.

END 15300

DIVISION 15 - MECHANICAL
Section 15320- Fire Protection

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Hydraulically designed automatic wet and / or dry pipe fire sprinkler system, including the design, approvals, piping, valves, fittings, hangers, sleeves, escutcheons, alarms, identification, and sprinkler heads.
- B. The work shall incorporate a complete design / build approach including the engineering, development of working drawings for the engineered contract documents, permits, approvals, computer hydraulic design calculations, inspections and system performance testing in accordance with state and local governing authority requirements.
- C. Helipad foam fire extinguishing system shall be designed and installed to protect the rooftop landing pad.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate pipe routes, head locations and types and all components of the design.
- B. Product Data: Provide data on; Pipe and fittings, Valves, Sprinkler heads, and Accessories

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Include legible schematic of piping and wiring diagrams of installed electrical equipment. List symbols corresponding to identity or markings on machine room apparatus.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Installer: Company specializing in manufacturing fire protection systems with minimum three years documented experience.
- B. Perform Work in accordance with the following requirements:

- a. Requirements of building and mechanical codes and local and state ordinances adopted by the authorities having jurisdiction.
 - b. The latest published NEC, NEMA, ASME and UL standards.
 - c. Requirements of local utility companies and the fire department.
 - d. NFPA 13, 14, 20 and 24.
- C. The fire protection system shall incorporate conveniences for maintenance and future remodeling.

1.5 PERFORMANCE REQUIREMENTS

- A. Provide system in accordance with light hazard occupancy requirements, except in mechanical rooms which require ordinary hazard requirements.
- B. Follow the requirements of local utility companies and the fire department. Follow the recommendations of the latest published NEC, NEMA, ASME and UL standards as applicable. Follow NFPA 13, 14, 20 and 24, as applicable.
- C. Test pressure and flow characteristics of the water service prior to hydraulic design.
- D. Piping shall not be exposed except in stairs, future areas, mechanical rooms or rooms without ceilings.
- E. All valves controlling main water supplies shall be provided with tamper switches.
- F. Flow alarms shall be provided as required by code.
- G. Wiring to a control panel, if required by code, shall be by the electrical contractor.
- H. The sprinkler head density shall be as determined by the sprinkler contractor's calculations in accordance with the requirements for light hazard occupancy.
- I. The initial design shall include sprinkler piping sized to accommodate one (1) head per eighty five (85) square feet in suite areas.
- J. System shall be zoned by floor.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.
- C. The fire protection system shall be a NFPA-13 and NFPA-14 complying system including a wet fire sprinkler system, a pre-action fire sprinkler system, a fire pump, and a stand pipe.

1.7 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include manufacturer's standard warranty coverage for operating equipment and device.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Pipe: Overhead piping shall be ASTM A53# , A135 or A795 black steel with clean-cut tapered threads or plain end grooved for couplings as required; standard weight Schedule 40 for threaded pipe, grooved, welded-pipe and thin wall, listed Schedule 10 for 2-1/2" or larger roll groove and welded pipe. Other types of fittings are not permitted.
- B. Threaded fittings: Cast iron Class 125, ANSI B16.4 or malleable iron Class 150, ANSI 16.3.
- C. Grooved coupling fittings: 175 psi cold working pressure, malleable iron fittings, ASTM A 47 with EPDM or Buna-N gaskets.

2.2 VALVES

- A. Shut-Off Valves; shall be gate, butterfly or ball valves, threaded brass or bronze as manufactured by ITT, Nibco, Grinnell or Jenkins.
- B. Gate Valves: OS & Y flanged type, 175 psi working pressure, Kennedy, IBBM or Jenkins.
- C. Check Valves: UL listed, non-slamming type swing check valves with bronze faced disc:
 - a. Check valves 2-1/2" or smaller: Threaded brass or bronze approved type, ITT, Grinnell or Jenkins.
 - b. Check valves 3" or larger: Flanged type, 175 psi working pressure, Kennedy, IBBM or Jenkins.
 - c. Test Valves: UL listed inspector test valve with gauges.
 - d. Drain Valves: All auxiliary drain valves 175 psi rated bronze with solid wedge discs and rising stems.
 - e. All test and drain valves (serving more than 5 gallons) shall be piped to discharge to the exterior. Auxiliary drains may discharge in adequate sized mechanical room floor drains.
- D. Control valves and water flow detectors; shall have UL Listed supervisory switches which are electrically compatible with the fire alarm system equipment. All control and drain valves shall be permanently tagged to show the corresponding sprinkler system zone. Water flow detectors shall have a mechanical or electrical retard.

- E. Fire Department Connection: Brass body 4" inlet with two (2) 2-1/2" connections, national hose thread cap and chains; clapper type independent check valves with ground seats; and nameplate "AUTO SPKR & STANDPIPE"; Potter Roemer 5022D. Verify sizes with the Local Fire Department.
- F. Identification: Each valve shall be tagged and numbered corresponding with a valve schedule.
 - a. Tags shall be minimum twenty (20) gauge polished brass not less than 1-1/2" diameter with 1/4" stamped letters identifying service and 1/2" stamped letters identifying valve number.
 - b. Tags shall be secured with approved meter seal, brass "s" hooks or brass jack chain.
 - c. Valve charts shall be provided in duplicate. One mounted in an aluminum frame with plexiglass secured on a wall in the main mechanical room, and the other enclosed in a transparent plastic covering with two grommet reinforced holes at the top and an 8" length of nickel plated chain.
 - d. Charts shall include the following information:
 - i. Valve identification number
 - ii. Location
 - iii. Purpose
 - iv. Type
 - v. Service
 - vi. Pressure
 - vii. Class
 - viii. Manufacturer
 - ix. Figure number

2.3 SPRINKLER HEADS – MEDICAL OFFICE BUILDING

- A. Sprinkler heads shall have proper temperature ratings in accordance with NFPA 13.
- B. Sprinkler heads in lobbies, atriums and common area drywall soffits shall be quick response pendent, white painted sprinkler heads, concealed with white cover plate.
- C. Sprinkler heads in all other finish areas shall be quick response pendent, white painted sprinkler heads, with white escutcheons, semi-recessed with white finish.
- D. Brass upright sprinkler heads shall be provided in areas without a finished ceiling.

2.4 SPRINKLER HEADS – PARKING STRUCTURE

- A. Sprinkler heads shall have proper temperature ratings in accordance with NFPA 13. Sprinkler heads shall be quick response fusible solder (rated at 165 degrees F.) or bulb type (rated at 155 degrees F.).
- B. Sprinkler heads in Lobbies and other areas with finished ceilings shall be quick response pendent, white painted sprinkler heads, with escutcheons, semi-recessed with white finish.

- C. Sprinkler heads in all other areas shall be rough or chrome plated brass upright or pendent heads.
- D. Brass upright sprinkler heads shall be provided in areas without a finished ceiling.

2.5 ACCESSORIES

- A. Backflow preventer: If required by code, provide FEBCO or Water backflow preventor.
- B. Pipe sleeves; shall be schedule forty (40) steel pipe.
- C. Escutcheons; shall be chrome plated sectional type.
- D. Flow alarm switches; shall be UL and/or FM approved, paddle type indicator.
- E. Alarm bells; shall be 10" weatherproof, located outside the building where required by code.
- F. A metal sprinkler cabinet with four (4) additional sprinkler heads of each type and sprinkler wrench for emergency use shall be provided.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Piping and fittings shall be anchored, clamped and rodded as required for proper support and to satisfy code required seismic requirements. Hangers shall be adjustable 1-1/2" minimum vertically and shall be installed within 12" of each horizontal elbow.
- C. Piping shall be installed as tightly against structural components as possible to allow for maximum finished ceiling heights.
- D. Sleeves shall be flush with wall and ceiling surfaces. Openings around sleeves shall be sealed with fiberglass and silicone caulking. Where pipes pass through fire rated construction, openings around piping shall be sealed with fire safing and fire resistant joint sealer satisfying the requirements of ASTM E 814.
- E. Escutcheons shall be installed on all piping passing through floors, walls and ceilings where piping is to remain exposed.
- F. Valves shall be located in accessible areas wherever possible. Key operated, concealed hinge access doors equal to Zurn Z-1460-4 shall be provided if valves are required to be installed in inaccessible areas.

- G. Cuts in ceiling material shall be totally concealed by escutcheons.
- H. Heads shall be fully installed in ceiling tile material, avoiding all conflict with fixtures and ceiling grid, as close to the center of ceiling tile as possible. Exact centering in tile is not required. Locate heads as close to center as possible in a room. Exact centering in a room is not required.
- I. Flow alarm switches shall be provided where required by the local authority having jurisdiction.

3.3 TESTS BY CONTRACTOR

- A. Pre-construction Testing: Pressure and flow characteristics of the water service shall be tested and verified prior to beginning hydraulic design.
- B. Post-construction Testing: Prior to concealing piping, completed sprinkler system shall be subjected to a hydrostatic pressure test at 200 lbs per square inch (psi) or 50 psi over system working pressure, whichever is greater, for a minimum two hour period in the presence of Landmark and appropriate city, fire department and state officials.
 - a. Provide all required flow tests in accordance with NFPA 13, NFPA 14 and NFPA 72.
 - b. Provide all required fire pump test in accordance with NFPA 20 and NFPA 72.

3.4 TESTS BY REGULATORY AGENCIES

- A. Testing by regulatory agencies will be performed at their discretion; and shall be documented by the Contractor.
- B. Obtain required permits to perform tests. Perform tests required by regulatory agencies.
- C. Schedule tests with agencies and if possible, with Landmark present.
- D. Furnish test and approval certificates issued by jurisdictional authorities.

3.5 ADJUSTING AND CLEANING

- A. Clean all sprinkle heads and exposed fire protection system components.

END 15320.

DIVISION 15 - MECHANICAL
Section 15340- FIRE PROTECTION PREACTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. A hydraulically designed automatic pre-action sprinkler system in accordance with light hazard occupancy requirements, including the design, approvals, piping, valves, fittings, hangers, sleeves, escutcheons, alarms, identification, and sprinkler heads.
- B. The work shall incorporate a complete design/build approach including the engineering, development of working drawings for the engineered contract documents, permits, approvals, computer hydraulic design calculations, inspections and system performance testing in accordance with state and local governing authority requirements.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate pipe routes, head locations and types and all components of the design.
- B. Product Data: Provide data on: Pipe and fittings, Valves, Sprinkler heads, and Accessories

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Include legible schematic of piping and wiring diagrams of installed electrical equipment. List symbols corresponding to identity or markings on machine room apparatus.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Installer: Company specializing in manufacturing fire protection systems with minimum three years documented experience.
- B. Perform Work in accordance with the following requirements:
 - a. Requirements of building and mechanical codes and local and state ordinances adopted by the authorities having jurisdiction.

- b. The latest published NEC, NEMA, ASME and UL standards.
 - c. Requirements of local utility companies and the fire department.
 - d. NFPA 13, 14, 20 and 24.
- C. The fire protection system shall incorporate conveniences for maintenance and future remodeling.

1.5 PERFORMANCE REQUIREMENTS

- A. Provide system in accordance with light hazard occupancy requirements except ordinary hazard in mechanical rooms.
- B. Follow the requirements of local utility companies and the fire department. Follow the recommendations of the latest published NEC, NEMA, ASME and UL standards as applicable. Follow NFPA 13, 14, 20 and 24, as applicable.
- C. Test pressure and flow characteristics of the water service prior to hydraulic design.
- D. Piping shall not be exposed except in stairs, future areas, mechanical rooms or rooms without ceilings.
- E. All valves controlling main water supplies shall be provided with tamper switches.
- F. Flow alarms shall be provided as required by code.
- G. Wiring to a control panel, if required by code, shall be by the electrical contractor.
- H. The sprinkler head density shall be as determined by the sprinkler contractor's calculations in accordance with the requirements for light hazard occupancy.
- I. The initial design shall include sprinkler piping sized to accommodate one (1) head per eighty five (85) square feet in suite areas.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.
- C. The fire protection system shall be a NFPA-13 and NFPA-14 complying system including a wet fire sprinkler system, a pre-action fire sprinkler system, a fire pump, and a stand pipe.

1.7 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.

- B. Warranty: Include manufacturer's standard warranty coverage for operating equipment and device.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Pipe: Overhead piping shall be ASTM A53# , A135 or A795 black steel with clean-cut tapered threads or plain end grooved for couplings as required; standard weight Schedule 40 for threaded pipe, grooved, welded-pipe and thin wall, listed Schedule 10 for 2-1/2" or larger roll groove and welded pipe. Other types of fittings are not permitted.
- B. Threaded fittings: Cast iron Class 125, ANSI B16.4 or malleable iron Class 150, ANSI 16.3.
- C. Grooved coupling fittings: 175 psi cold working pressure, malleable iron fittings, ASTM A 47 with EPDM or Buna-N gaskets.

2.2 AIR MAINTENANCE SYSTEM

- A. Air Maintenance System; shall include a compressor with 1/3 HP, 115V, 1 phase motor and 10 gallon pressure tank.
 - a. Tank; shall include pressure gauge, relief valve, and differential pressure switch for compressor control.
 - b. Motor starter; shall be by the Electrical Contractor and will have a 115V control circuit. All FM approved.
 - c. Air Maintenance Device; shall include pressure regulator, relief valve, strainer and restriction.
- B. Alarm Valve: Alarm valve with cast iron body and bronze clapper.
 - a. Unit shall include trim piping for external by-pass, alarm test by-pass, gauges and drain connections.
 - b. Provide a retarding chamber to compensate for supply pressure variations and to prevent false alarms.
 - c. Unit shall come complete with mounting supports and drip funnel.
 - d. Provide mechanical or hydrostatic pressure switches to indicate system activation; when the alarm valve has opened and water is flowing in the system.

2.3 VALVES

- A. Shut-Off Valves; shall be gate, butterfly or ball valves, threaded brass or bronze as manufactured by ITT, Nibco, Grinnell or Jenkins.

- B. Gate Valves: OS & Y flanged type, 175 psi working pressure, Kennedy, IBBM or Jenkins.
- C. Check Valves: UL listed, non-slamming type swing check valves with bronze faced disc:
 - a. Check valves 2-1/2" or smaller: Threaded brass or bronze approved type, ITT, Grinnell or Jenkins.
 - b. Check valves 3" or larger: Flanged type, 175 psi working pressure, Kennedy, IBBM or Jenkins.
 - c. Test Valves: UL listed inspector test valve with gauges.
 - d. Drain Valves: All auxiliary drain valves 175 psi rated bronze with solid wedge discs and rising stems.
 - e. All test and drain valves (serving more than 5 gallons) shall be piped to discharge to the exterior. Auxiliary drains may discharge in adequate sized mechanical room floor drains.
- D. Control valves and water flow detectors; shall have UL Listed supervisory switches which are electrically compatible with the fire alarm system equipment. All control and drain valves shall be permanently tagged to show the corresponding sprinkler system zone. Water flow detectors shall have a mechanical or electrical retard.
- E. Identification: Each valve shall be tagged and numbered corresponding with a valve schedule.
 - a. Tags shall be minimum twenty (20) gauge polished brass not less than 1-1/2" diameter with 1/4" stamped letters identifying service and 1/2" stamped letters identifying valve number.
 - b. Tags shall be secured with approved meter seal, brass "s" hooks or brass jack chain.
 - c. Valve charts shall be provided in duplicate. One mounted in an aluminum frame with plexiglass secured on a wall in the main mechanical room, and the other enclosed in a transparent plastic covering with two grommet reinforced holes at the top and an 8" length of nickel plated chain.
 - d. Charts shall include the following information:
 - i. Valve identification number
 - ii. Location
 - iii. Purpose
 - iv. Type
 - v. Service
 - vi. Pressure
 - vii. Class
 - viii. Manufacturer
 - ix. Figure number

2.4 SPRINKLER HEADS – MEDICAL OFFICE BUILDING

- A. Sprinkler heads shall have proper temperature ratings in accordance with NFPA 13.

- B. Sprinkler heads shall be quick response pendent, white painted sprinkler heads, with white escutcheons, semi-recessed with white finish.
- C. Brass upright sprinkler heads shall be provided in areas without a finished ceiling.

2.5 ACCESSORIES

- A. Pipe sleeves; shall be schedule forty (40) steel pipe.
- B. Escutcheons; shall be chrome plated sectional type.
- C. Flow alarm switches; shall be UL and/or FM approved, paddle type indicator.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Piping and fittings shall be anchored, clamped and rodded as required for proper support and to satisfy code required seismic requirements. Hangers shall be adjustable 1-1/2" minimum vertically and shall be installed within 12" of each horizontal elbow.
- C. Piping shall be installed as tightly against structural components as possible to allow for maximum finished ceiling heights.
- D. Sleeves shall be flush with wall and ceiling surfaces. Openings around sleeves shall be sealed with fiberglass and silicone caulking. Where pipes pass through fire rated construction, openings around piping shall be sealed with fire safing and fire resistant joint sealer satisfying the requirements of ASTM E 814.
- E. Escutcheons shall be installed on all piping passing through floors, walls and ceilings where piping is to remain exposed.
- F. Valves shall be located in accessible areas wherever possible. Key operated, concealed hinge access doors equal to Zurn Z-1460-4 shall be provided if valves are required to be installed in inaccessible areas.
- G. Cuts in ceiling material shall be totally concealed by escutcheons.
- H. Heads shall be fully installed in ceiling tile material, avoiding all conflict with fixtures and ceiling grid, as close to the center of ceiling tile as possible. Exact centering in tile is not required. Locate heads as close to center as possible in a room. Exact centering in a room is not required.

- I. Flow alarm switches shall be provided where required by the local authority having jurisdiction.

3.3 TESTS BY CONTRACTOR

- A. Pre-construction Testing: Pressure and flow characteristics of the water service shall be tested and verified prior to beginning hydraulic design.
- B. Post-construction Testing: Prior to concealing piping, completed sprinkler system shall be subjected to a hydrostatic pressure test at 200 per square inch (psi) or 50 psi over system working pressure, whichever is greater, for a minimum two hour period in the presence of Landmark and appropriate city, fire department and state officials.
 - a. Provide all required flow tests in accordance with NFPA 13, NFPA 14 and NFPA 72.
 - b. Provide all required fire pump test in accordance with NFPA 20 and NFPA 72.

3.4 TESTS BY REGULATORY AGENCIES

- A. Testing by regulatory agencies will be performed at their discretion; and shall be documented by the Contractor.
- B. Obtain required permits to perform tests. Perform tests required by regulatory agencies.
- C. Schedule tests with agencies and if possible, with Landmark present.
- D. Furnish test and approval certificates issued by jurisdictional authorities.

3.5 ADJUSTING AND CLEANING

- A. Clean all sprinkle heads and exposed fire protection system components.

END 15340

DIVISION 15 - MECHANICAL
Section 15400- Basic Plumbing Requirements

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Plumbing systems basic requirements.

1.2 BASIC PLUMBING REQUIREMENTS

- A. Plumbing: All plumbing lines, valves, pumps, tanks, equipment, accessories, and other miscellaneous items shall be provided for a complete and working plumbing system. The plumbing system shall incorporate conveniences for maintenance and future remodeling by valving small groups of fixtures and locating soil and vent stacks at interior columns.
 - a. The Plumbing system shall comply with all state and local building and mechanical codes and local ordinances used by the authority having jurisdiction.
 - b. Reduced response time for hot water shall be provided at point of use by means of hot water circulating system.

1.3 EQUIPMENT ARRANGEMENTS, ROUGHING AND INSTALLATION

- A. Due to the small scale of the Drawings, it is not possible to indicate all offsets, fittings, changes in elevations, interferences, etc. Make necessary changes in the work, equipment locations, etc. as part of the contract to accommodate work to obstacles and interferences encountered. Before installing, verify exact location and elevation at work site.
- B. Coordinate work with other trades and determine route or location of each duct, pipe, conduit, etc., before fabrication and installation.
- C. Provide material with flame spread rating of 25 or less and a smoke development rating of 50 or less, in accordance with NFPA 255. All equipment and material for which there is a listing service shall bear the UL label.
- D. Conceal all work above ceilings, in walls, below slabs and elsewhere throughout building. If concealment is impossible, notify Landmark before starting work, and install only after review.
- E. Chases; assume responsibility for correct and final location and size of openings and chases. Provide firestopping for openings in fire and smoke rated walls, roof and floor assemblies.
- F. Supports; provide required supports, beams, angles, hangers, rods, bases, braces, and other items to properly support the work.

END 15400.

DIVISION 15 - MECHANICAL
Section 15420- Plumbing System

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sanitary sewer piping, storm sewer piping, domestic water supply piping, fittings, valves, specialties, and pumps

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on the following items:
 - a. Valves.
 - b. Water heaters.
 - c. Recirculating pump.
 - d. Tank.
 - e. Backflow preventer.
 - f. Hot water heater circuit setters.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Include legible schematic of piping and wiring diagrams of installed electrical equipment and changes made in the Work.
 - d. Include information for circulating pumps
 - e. Include information for hot water heaters.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- C. Water Test Results: Submit test results that indicate new domestic water systems produce water that is potable.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the following requirements;
 - a. Local utility company.
 - b. ASME B 31.9 “Building Services Piping” for materials, products and installation. Safety valves and pressure vessels shall bear the appropriate ASME label.
 - c. Code required seismic anchorage and support.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building and plumbing code and local ordinances for manufacture, product, and installation of system.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.6 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include manufacturer’s standard warranty coverage for operating equipment and devices.
 - a. Manufacturer’s three (3) year warranty for circulating or domestic booster pumps, sump pumps and sewage ejectors
 - b. Manufacturer’s three (3) year warranty for water heaters.

1.7 DEMONSTRATION

- A. Landmark, Owner, and Hospital personnel shall be instructed in the proper use, operation, and daily maintenance.
- B. Review emergency provisions, including emergency access and procedures to be followed at the time of failure in operation and other building emergencies.
- C. Train Hospital’s personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions.

PART 2 PRODUCTS

2.1 PIPING AND FITTINGS

- A. Water Supply Piping; shall be one of the following, unless otherwise required by code:
 - a. Ductile Iron Pipe: ANSI A21.51 or AWWA C 151 with ANSI A21.4 cement lining.

- b. Copper Tubing: ASTM B 88, Copper with wrought fittings, below ground type K soft temper with 95/5 lead free solder, above ground type L hard temper with 95/5 lead free solder.
- B. Water Supply Pipe Fittings; shall be one of the following, unless otherwise required by code:
- a. Ductile Iron Gasketed Fittings: ANSI B 16.42, Class 150, with AWWA C111 or ANSI A 21.11 rubber gaskets.
 - b. Wrought Copper: ANSI B 16.22, joined with ASTM B 32, no lead solder.
 - c. Unions: ANSI B16.39, malleable iron, Class 150.
- C. Drainage and Vent Piping; shall be one of the following, unless otherwise required by code:
- a. Cast Iron Soil Pipe: ASTM A74, service weight hub and spigot pipe and fittings.
 - b. Hubless Cast Iron Soil Pipe: CISPI 301 service weight.
 - c. PVC Pipe: ASTM D 2665 or D2949.
 - d. Copper: ASTM B 42, B 88 and B 306 Type DWV.
- D. Drainage and Vent Pipe Fittings:
- a. Cast Iron Pipe Above Grade: Hubless fittings with neoprene CISPI 310 gaskets and stainless steel bands.
 - b. Cast Iron Pipe Below Grade: Hub and spigot fittings with neoprene compression type gaskets conforming to ASTM C564.
 - c. PVC Pipe: NSF approved solvent solder joints compatible with the material being used. Primer shall conform to ASTM F 656. Solvent cement shall conform to ASTM D 2564. Heavy bodied solvent shall be used on piping 8" and larger.
 - d. Copper: Wrought copper or brass fittings; mechanically cleaned 50-50 solder joints with paste flux.
- E. Pipe identification: All piping shall be color coded using legend markers and directional arrows after piping has been covered, if insulated, and after painting. Pipe markers shall be in accordance with ANSI standard A 13.1-1981 with arrows as manufactured by Seton Name Plate Corp., Craftsmark, Panduit or WH Brady.

2.2 VALVES

- A. Water Supply Pipe Valves: The manufacturer's name and valve number shall be cast into the body of the valve. Each valve shall be tagged and numbered corresponding with a valve schedule which shall provide the location, purpose, type, service, pressure, class, manufacturer, and figure number. One of the following approved manufacturer's may be used:

- a. Bell & Gossett (B&G)
 - b. Hammond
 - c. ITT Grinnell
 - d. Milwaukee
 - e. NIBCO
 - f. Watts
- B. Ball Valves: For piping 2-1/2" and smaller rated for 600 psi WOG, bronze body, two-piece full-port, replaceable Teflon seats and seals, with vinyl coated steel handle to protect installation; equal to NIBCO 580-70 for piping larger than 1" and 585-70 for piping 1" and smaller.
- C. Butterfly Valves: For piping 3" and larger, MSS SP-67, 200 psi, ductile iron body, nickel plated ductile iron disc, stainless steel stem, and EDPM O-ring stem seals; equal to NIBCO #LD-2010.
- D. Gate Valves: Rising stem, union bonnet, brass body, for 2" and under. For piping 2 1/2" and larger, iron body, bronze trim, equal to NIBCO #F-617-0.
- E. Check Valves: 2-1/2" and smaller, Class 125, bronze body, in-line non-slamming lift type, Teflon seal, resilient disc., equal to NIBCO #S-480; 3" and larger, 125 lb. WOG wafer type, renewable bronze disc and seat, equal to NIBCO #W-910.
- F. Balancing Valves: 3/4" and smaller shall be calibrated bronze plug valve with tapping orifice: B&G CB-3/4 or CB-1/2, or equal Watts or Armstrong.
- G. Trap Seal Primer Valves: ASSE 1018, water-supply-fed type, 125 psig, bronze body with atmospheric-vented drain chamber.
- a. Inlet and Outlet Connections: NPS 1/2 (DN 15) threaded, union, or solder joint.
 - b. Gravity Drain Outlet Connection: NPS 1/2 (DN 15) threaded or solder joint.
 - c. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.
 - d. One of the following equal manufacturers may be used:
 - i. Josam Co.
 - ii. MIFAB Manufacturing, Inc.
 - iii. Precision Plumbing Products, Inc.
 - iv. Smith, Jay R. Mfg. Co.
 - v. Tyler Pipe; Wade Div.
 - vi. Watts Industries, Inc.

- vii. Zurn Industries, Inc.
- e. Types:
 - i. Single drain: Watts A200 or equal by other specified manufacturers.
 - ii. Multiple drain: Watts T20 with D20 distributor or equal by other specified manufacturers.
- H. Valve Identification: Each valve shall be tagged and numbered corresponding with a valve schedule.
 - a. Tags shall be minimum twenty (20) gauge polished brass not less than 1-1/2" diameter with 1/4" stamped letters identifying service and 1/2" stamped letters identifying valve number.
 - b. Tags shall be secured with approved meter seal, brass "s" hooks or brass jack chain.
 - c. Valve charts shall be provided in duplicate, one (1) mounted in an aluminum frame with plexiglass secured on a wall in the main mechanical room, and the other enclosed in a transparent plastic covering with two (2) grommet reinforced holes at the top and an 8" length of nickel plated bead chain attached.
 - d. Charts shall include the following information:
 - i. Valve identification number
 - ii. Location
 - iii. Purpose
 - iv. Type
 - v. Service
 - vi. Pressure
 - vii. Class
 - viii. Manufacturer
 - ix. Figure number

2.3 WATER HEATERS AND TANKS

- A. Water Heaters shall be natural gas
- B. Automatic Circulating Water Heaters: shall be constructed for 160 psi working pressure. Water heaters shall be provided with relief valve, automatic gas shutoff, pilot safety shutoff, insulated jacket, gas pressure regulators as required, and adjustable thermostat. Provide capacity and performance of heaters as schedule.
 - a. Heater exchanger shall have a gasketless design.
 - b. Heaters shall be ASME constructed.
 - c. Heaters shall meet the requirements of ASHRAE 90.1 for energy conservation.

- d. Provide mechanical draft inducer for vent installation in accordance with the manufacturer's recommendations.
 - e. Heaters shall be provided with concentric vent side wall termination kits complete with rain caps.
 - f. Water heater temperature shall be set at one hundred twenty (120) degrees Fahrenheit, unless noted otherwise on the Drawings.
 - g. One of the following equal manufacturers may be used:
 - i. Lochinvar
 - ii. Laars
 - iii. Reco
- C. Hot water storage tank shall be provided with relief valve, magnesium anode rod, glass lining on internal wetted surfaces, fiberglass insulated jacket, and drain valve. Provide capacity of water tank as scheduled.
- a. Tank shall meet ASME Boiler and Pressure Vessels Code and shall be stamped for 125 psig working pressure.
 - b. One of the following equal manufacturers may be used:
 - i. Amtrol
 - ii. Lochinvar
 - iii. Wessels Co.
- D. Central Mixing Valve
- a. Size and capacity shall be provided as scheduled on drawings.
 - b. Temperature range: 80° F to 115° F
 - c. Mixing valve shall be thermostatic type and shall meet ASSE 1017 performance requirements down to 2-gpm. Mixing valve shall have temperature adjustment, dial thermometer, and inlet strainers. Complete assembly shall be rated for not less than 150 psi working pressure. Valve construction shall be exposed rough brass.
 - d. One of the following equal manufacturers may be used:
 - i. Lawler Manufacturing Co., Inc., Indianapolis, IN
 - ii. Leonard Water Temperature Controls, Cranston, RI
 - iii. Powers Process Controls, Skokie, IL
 - iv. Watts Water Products Division, North Andover, MA
- E. Expansion Tanks: Thermal expansion tanks shall be pre-charged with butyl diaphragm, welded carbon steel construction, threaded water connection, 0.302"-32 air charging valve (standard tire valve fitting), tank mounting (sizes over 5 gal.), and epoxy finish. All wetted

surfaces shall be isolated from the steel vessel. Tank pre-charge shall as scheduled on Drawings. Provide capacity of tank as scheduled.

- a. One of the following approved equal manufacturers may be used:
 - i. Amtrol
 - ii. Bell & Gossett
 - iii. Taco
 - iv. Watts

2.4 WATER HEATERS (Small Building SLCH)

- A. Heaters shall be gas or electric as shown on Drawings and shall be constructed for 150 psi working pressure.
- B. Gas Water Heaters: shall be gas, constructed for 150 psi working pressure. Water heaters shall be provided with relief valve, magnesium anode rod, glass lining on internal wetted surfaces, automatic gas shutoff, pilot safety shutoff, foam insulated jacket, drain valve, radiant floor shield, gas pressure regulators as required, and adjustable thermostat.
 - a. Heater exchanger shall have a gasketless design.
 - b. Heaters shall be ASME constructed.
 - c. Heaters shall meet the requirements of ASHRAE 90.1 for energy conservation.
 - d. Provide mechanical draft inducer for sidewall vent installation in accordance with the manufacturers recommendations.
 - e. One of the following equal manufacturers may be used:
 - i. A.O. Smith
 - ii. Bock
 - iii. Bradford White
 - iv. PVI
 - v. Rheem/Ruud
 - vi. State
- C. Electric Water Heaters: shall be electric, constructed for 150 psi working pressure. Water heaters shall be provided with relief valve, magnesium anode rod, glass lining on internal wetted surfaces, insulated jacket, drain valve, and adjustable thermostat.
 - a. Heaters shall meet the requirements of ASHRAE 90.1 for energy conservation.
 - b. Water heater temperature shall be set at one hundred twenty (120) degrees Fahrenheit.
 - c. One of the following manufacturers may be used:
 - i. A.O. Smith
 - ii. Bock

- iii. Bradford White
- iv. PVI
- v. Rheem/Ruud
- vii. State

D. Point-of-Use Electric Water Heaters: Shall be constructed for minimum 150 PSI working pressure. Water Heater shall include temperature and pressure relief valve, anode rod, glass lining on interior wetted surface, insulation, jacket, drain valve and adjustable thermostat.

- a. Shall meet or exceed National Appliance Energy Conservation Act (NAECA) requirements.
- b. Shall be U.L. listed and comply with Underwriter's Laboratories Specifications 174 and meet or exceed ASHRAE 90.16 Standard.
- c. Water heater temperature shall be set at 120 degrees Fahrenheit.
- d. One of the following manufacturers may be used:

- i. A. O. Smith
- ii. Rheem/Ruud
- iii. State Industries
- iv. Bradford White

E. Expansion Tanks: Thermal expansion tanks shall be domestic potable water rated, pre-charged with butyl diaphragm, welded carbon steel construction, threaded water connection, 0.302"-32 air charging valve (standard tire valve fitting), tank mounting (sizes over 5 gal.), and epoxy finish. All wetted surfaces shall be isolated from the steel vessel. Tank pre-charge shall be field re-set or as noted on Drawings.

- a. One of the following approved equal manufacturers may be used:

- i. Amtrol
- ii. Bell & Gossett
- iii. Taco
- iv. Watts

2.5 RECIRCULATING PUMP

A. Recirculating Pumps: shall be horizontal type with bronze body, steel shaft with integral thrust collar, sleeve bearings, mechanical seal, and non-overloading motor and flexible coupling; aquastat controlled. One of the following equal manufacturers may be used:

- a. Bell & Gossett
- b. Taco
- c. Thrush
- d. Grundfoss.

B. Recirculating Pump Timer; shall be strap mounted or pump mounted.

- C. Provide 7-day timer to control operation of recirculation pump. Settings shall correspond to building occupancy.

2.6 BACKFLOW PREVENTERS

A Backwater Valves:

- a. Valves shall be cast iron with bronze valve and seat conforming to ANSI A 112.14.1. Valves shall be J.R. Smith 7012 or 7022, or equal.
 - b. Vault shall be 36" diameter, pre-cast concrete with integral base conforming to ASTM C 478. For exterior installations, pre-cast concrete structure, frame and cover shall be rated for AASHTO H20 wheel loads. Joints shall be sealed with waterproofing such as Tremproof 60, Duramen V500 or Thiodeck CF.
 - c. Frame and cover: Neenah R1593 or equal.
- B. Reduced Pressure Principle Backflow Preventer (ASSE 1013): as required by code, furnish approved reduced pressure principle backflow preventer, complete with control valves, test cocks, air gap at vent port, and local waste pipe to drain.
- a. Preventer size shall be pipeline size or as indicated on drawings.
 - b. For 2 1/2" or larger: Watts 957 OSY, Hersey Products, Inc. FRP-II or equal by other listed manufacturers.
 - c. For 2" or less: Watts 919 QT-S, or equal by other listed manufacturers.
 - d. Furnish with strainer at inlet and provide drain valve at strainer plug.
 - e. Provide Water Hammer Arrestor downstream of backflow preventer if preventer connects to quick opening valves such as quarter-turn valves and solenoids.
 - f. One of the following approved manufacturers may be used:
 - i. Ames Company, Woodland, CA
 - ii. Febco, CMB Industries, Fresno, CA
 - iii. Hersey Products Inc., Dedham, MA
 - iv. Watts Water Products Division, North Andover, MA
 - v. Wilkins Division, Paso Robles, CA
- C. Air gaps shall comply with ANSI A112.1.2.
- D. Pipe Applied Atmospheric Type Vacuum Breaker (ASSE 1001): furnish approved device as required by code.
- E. Hose Connection Vacuum Breaker (ASS# 1011): furnish approved device as required by code. This is not required where a drain valve is only intended to drain pipes, tanks or equipment.

- F. Backflow Preventer with Intermediate Atmospheric Vent (ASSE 1012) complete with indirect waste pipe to drain and air gap; Hersey Products, Inc. BCP.
- G. Pressure Vacuum Breaker (ASSE 1020): furnish approved device as required by code. Mount height of device as required by code.
- H. Backflow Preventer for Carbonated Beverage Machine (ASSE 1022): where required by code, furnish approved backflow preventer, complete with indirect waster pipe to drain and air gap.
 - a. Provide Watts 3/8 inch SD-3 or review equivalent.
- I. Laboratory Faucet Backflow Preventer (ASSE 1035): furnish approved device as required by code.
- J. Black Siphonage Vacuum Breaker (ASSE 1056): as required by code, furnish approved back siphonage vacuum breaker complete with quarter-turn control valves, and test cock.
 - a. Preventer size shall be pipeline size or as indicated on drawings.
 - b. Mount height of device as required by code.
 - c. Furnish with satin chrome finish.
 - d. Furnish Watts 008QT-SC, or reviewed equivalent.

2.7 SPECIALTIES

- A. Air Vent: Brass body with stainless non-ferrous internal working parts, float type. Vent opening varies with volume of air.
 - a. One of the following approved manufacturers may be used:
 - i. Amtrol
 - ii. Bell & Gossett
 - iii. Taco
 - iv. Watts
- B. Vacuum Relief Valve; Brass body with stainless steel non-ferrous internal working parts. One of the following approved manufacturers may be used:
 - a. Amtrol
 - b. Bell & Gossett
 - c. Taco
 - d. Watts
- C. Pressure Gauges and Thermometers: Comply with ASME B 31.1, ANSI B40.1, and ISA. Readings shall be suitable for pressures and temperatures encountered.

D. Clean outs shall be as follows:

	Josam	J.R. Smith	Zurn	Wade
Exposed Concrete Floors	56000-2	4028	1400-BP	6010
Tile Floors	56000-12	4148	1400-X	6010-T
Carpet Floors	56000-14	4028-Y	1400-CM	6010-72
Walls				
All surfaces	58710-22	4422	1441	8450-R
Exterior	58860-5	4250	Z-1400 with Z-1474 housing	

E. Strainers: “Y” type with stainless steel screen.

F. Water Hammer Arrestors; if required by code, provide water hammer arrestors in accordance with the hydraulic design of the piping system and manufacturers’ recommendations.

- a. Suppressors shall be J.R. Smith “Hydrotrol” or equal.
- b. Water Hammer Arresters shall be located in branch lines between the last two (2) fixtures.
- c. Water Hammer Arresters shall be equal to J.R. Smith 5000 series. Water Hammer Arresters shall be provided for each supply water branch, sized according to the following schedule:

Fixture Units	J.R. Smith No.
1-11	5005
12-32	5010
33-60 5020	
61-113	5030

d. Water Hammer Attester shall comply with ANSI A 112.26.1 or ASSE 1010.

e. One of the following approved manufacturers may be used:

- i. J.R. Smith
- ii. Watts
- i. Zurn

G. Wall Hydrant, Freeze Resistant, Automatic Draining Type (ASSE 1019): furnish approved device as required by code.

H. Hose Bibbs: Bronze body, renewable composition disc, 3/4” NPT inlet, 3/4” hose outlet.

- I. Supports and Anchors; shall be saddle type hangers for hanging insulated pipe, heavy wrought iron bolted type clamps or collars at each floor to support vertical piping, steel pipe hangers for steel and plastic pipe, and copper plated steel for copper pipe.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. All underground lines shall be laid straight in a trench with a minimum 6" clearance on each side of piping.
- C. Plumbing fixtures shown on Drawings and as listed within the Fixture Schedule shall be furnished and installed. Fixtures and trim shall be properly anchored.
- D. Waste, vent and water piping where noted on Drawings for equipment furnished by others shall be included. Final connections to such equipment is not included. Lines shall be capped for future hookup.
- E. Piping shall not be exposed except in Future Suited Area, Mechanical Rooms, at connections to fixtures or equipment and piping above roof.
- F. Shut-offs shall be provided at hot and cold water supplies to each fixture, to each suite or department and to each floor at each riser.
- G. Chrome plated sectional type escutcheons shall be provided at all locations where pipes protrude inside of cabinets or through walls in finished areas, mechanical rooms and janitor closets.
- H. All rough-ins shall be labeled.

3.3 INSTALLATION - PIPING

- A. Piping shall be installed as tightly against structural components as possible to allow for maximum finished ceiling heights.
- B. Minor location modifications shall be made to piping to coordinate and avoid conflicts with other pipes, ducts, conduits and structural members.
- C. Pipe sleeves shall be provided for all pipes passing through concrete or masonry construction. Sleeves shall be steel for pipes 6" and smaller, and sheet metal for larger sizes. Pipe penetrations through exterior walls shall have mechanical sleeve seals.

- D. Piping shall be sealed at penetrations in walls and floors. Where pipes pass through fire rated construction, openings around piping shall be sealed with fire safing and fire resistant joint sealer meeting the requirements of ASTM E 814.
- E. Flanges or unions shall be installed at all final connections to equipment.
- F. Dielectric fittings shall be installed wherever dissimilar metals are joined. Dielectric unions shall not be used.
- G. Factory fabricated horizontal pipe hangers and supports complying with MSS SP-58 and seismic requirements shall be provided. Hangers and supports shall be applied to suit piping system complying with MSS-SP-69 and shall be adjustable 1-1/2" minimum vertically and be installed with 12" of each horizontal elbow. Factory fabricated saddles and shields under pipe hangers and supports shall be provided for all insulated piping. Isolator bushings shall be provided on pipe at hangers, bridging or in contact with structural members. The spacing of pipe supports shall not exceed the following:

Pipe Size	Hanger Spacing Feet	Rod Size Inch
1	7	3/8
1-1/2	9	3/8
2	10	3/8
3	12	1/2
4	14	5/8
5	16	5/8
6	17	3/4
8	19	7/8
10	22	7/8
12	23	7/8

- H. Vertical pipes shall be supported with riser clamps at each floor and at tees and elbow at the base of risers.
- I. Horizontal cast iron piping shall be supported every 5'.
- J. Piping and other materials shall be supported from building structure with beam clamps wherever possible, and not from pipe, ductwork, conduit, ceiling systems or other non-structural members.
- K. Thermometers shall be located at outlet of water heaters and inlet to hot water circulating pumps.
- L. Shut-offs, unions and piping arrangement as required to individually replace water heaters without interrupting service shall be provided.

M. Rooftop air conditioning unit condensate piping installed above the roof shall be Schedule 40 ASTM D 1784 PVC with socket welded joints joined with PVC solvent cement complying with ASTM D 2564.

N. Water Distribution Piping:

- a. Hose connection vacuum breakers shall be installed on all fixtures having threaded hose bibb connections.
- b. Drain valves shall be installed on each plumbing equipment item, at the bottom of all risers, and all low points of the system.
- c. All piping at exterior walls and in soffits shall be installed on the interior side of the building insulation.
- d. Water piping shall not be installed in elevator equipment rooms or above electric/telephone rooms.
- e. Balancing valves shall be provided at recirculating pumps, at the top of each riser and where shown on Drawings, to balance the hot water recirculation system. Valves shall be field adjusted to the quantities indicated on Drawings.
- f. The system shall be sanitized per applicable codes and in accordance with AWWA C651.

O. Drain and Vent Piping Below Floor:

- a. Sewers shall be laid on 4" of bedding sand or pea gravel to support pipe evenly and avoid hubs supporting piping.
- b. Sanitary drains inside and under the building shall be installed at a minimum slope of 1/4" per foot for all pipe sizes.
- c. Cleanouts shall be installed so as not to conflict with resilient and ceramic tile base and shall not be installed beneath or behind cabinets. Cleanout covers shall be finished to match adjacent wall surfaces. Cleanouts in exposed concrete or carpeted floors shall be installed flush with concrete.
- d. Cleanouts shall be installed at the base of all soil and waste stacks, at all changes in direction, and in straight runs at intervals in accordance with local code.

P. Distribution pipe cleaning and flushing:

- a. Water distribution piping shall be cleaned for a sufficient length of time so that interiors shall be free of foreign matter. Cleaning shall occur after completion of pressure tests and before permanently connecting equipment. After cleaning operation, all systems shall be drained.
- b. Disinfection shall comply with local requirements and AWWA C 651. Water distribution piping shall be flushed by filling with a solution containing 50 ppm of chlorine and let stand for twenty-four (24) hours or a solution containing 200 ppm of chlorine and let

stand for three (3) hours. Flush with clear water until no chlorine remains and test for bacteria.

- c. Faucet aerators and faucet cartridges shall not be installed until after cleaning and flushing of the piping system.

3.4 INSTALLATION – BACKFLOW PREVENTERS

- A. Provide indirect waste pipe or local waste pipe or local waster pipe where required. Provide drains, air gaps, air breaks and traps as required. Provide visible access to all air gaps and air breaks.
- B. Secure installation permits and pay fees as required.

3.5 TESTS BY CONTRACTOR

- A. Perform tests required by state and local authorities,
 - a. Correct defects and re-test as required
- B. Tests Backflow Preventer:
 - a. An initial Performance Test shall be provided by reduced pressure principle backflow preventers and pressure vacuum breaker assemblies.
 - b. The Performance Test shall be performed at the time of installation and immediately after repairs or alterations.
 - c. Performance Test shall conform to ASSE standards by qualified individuals.
 - d. Performance Test results shall be furnished to Landmark in writing and shall be furnished to the State if required.
- C. Test interior domestic water piping hydrostatically at 125 psi for two hours. The pipe shall be tight and shall show no loss of pressure.
 - e. Test interior sanitary and storm piping by maintaining a 10’-0” head of water above the highest point of section being tested for six hours. There shall be no loss of water.

3.6 TESTS BY REGULATORY AGENCIES

- A. Testing by regulatory agencies will be performed at their discretion; and shall be documented by the Contractor.
- B. Obtain required permits to perform tests. Perform tests required by regulatory agencies.
- C. Schedule tests with agencies and if possible, with Landmark present.
- D. Furnish test and approval certificates issued by jurisdictional authorities.

3.7 ADJUSTING AND CLEANING

- A. If system is used during construction of the project, it shall be protected from damage.
 - a. All damaged parts or equipment shall be replaced prior to Substantial Completion and acceptance.
 - b. System shall be maintained, and left in like new operation prior to Substantial Completion and acceptance.
- B. Cleaning and disinfection of water lines shall be in accordance with the requirements of the State of the Project, the Health Department, the Utility Company and the authority having jurisdiction.
 - a. Prior to disinfecting, flush piping to remove any sediment and debris.
 - b. Clean and disinfect water distribution piping system of existing potable water systems that have been altered, extended or repaired.
- C. After disinfection procedures, submit water sample in sterile bottles to an approved Laboratory. Samples shall be proven equal to the water quality served by the public from the existing water supply system an acceptable to the authority having jurisdiction. Flush and disinfect all sections of pipe that fail the laboratory tests. Submit test results indicating water is potable.

END 15420

DIVISION 15 - MECHANICAL
Section 15430- Plumbing System Insulation

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Plumbing system insulation, pipe insulation, jackets, coverings, sealers, mastic, adhesives and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on insulation materials.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Provide insulation material with flame spread rating per NFPA 90.1 and UL 181,
- C. Provide insulation material with thermal performance and thickness per ASTM E84.
- D. Composite pipe insulation including jackets, coverings, sealers and mastics shall have a flame-spread index of twenty-five (25) or less and a fuel contributed and smoke-developed index of fifty (50) or less as tested by ASTM E 84 (NFPA 225).

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fiberglass Piping Insulation: ASTM C 547, Class I.
- B. Flexible Unicellular Pipe Insulation: ASTM C 534, Type I or Type II.
- C. Rigid and Semi-rigid Fiberglass Insulation; shall be minimum nominal density of 3 pcf with a white kraft reinforced foil vapor barrier all service jackets
- D. Jackets for Piping Insulation: ASTM C 921, Type I for piping with temperatures below ambient, Type II for piping with temperatures above ambient. Type I may be used for all piping.
- E. Insulation for pipe fittings shall be encased with one-piece premolded PVC fitting covers.
- F. Elastomeric Insulation; shall be flexible closed cell, minimum nominal density of 5.5 psf.
- G. Fireproofing Insulation; shall be mineral fiber with nominal density of 8 pcf, flame spread index of 0, and smoke development index of 0.

2.2 RIGID PIPE INSULATION

- A. Equipment insulation of double density fiberglass with integral fire retardant continuous vapor barrier jacket. One of the following equal manufacturers may be used:
 - a. Armstrong
 - b. Gustin-Bacon
 - c. Johns-Manville
 - d. Owens Corning

2.3 PIPE INSULATION LOCATIONS

- A. Hot Water Piping: Provide rigid fiberglass with integral all service jacket insulation for hot water supply and return piping including valves, and fittings.
- B. Cold Water (Domestic and Storm): Provide rigid fiberglass insulation with integral vapor barrier jacket or elastomeric applied insulation to form a vapor barrier, white 30 mil protective PVC jacketing and heavy duty PVC fittings including valves, and fittings.
- C. Hot water storage tank shall be factory insulated with painted steel jacket.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Cold Piping Application Requirements:
 - a. Cold domestic water piping - first fifty (50) feet of incoming service piping if installed in a return air ceiling plenum; all horizontal piping if installed in ducted return air spaces above ceilings.
 - b. Above-ground horizontal storm water piping and all cold condensate drain piping.
 - c. Roof drain bodies and sump pans.
 - d. Insulation shall be 1/2" thick.

C. Hot Piping Application Requirements:

- a. All potable hot water and hot water recirculating piping except drops to fixtures within partitions.
- b. Insulation shall be 1/2" thick for pipe sizes up to and including 1" and 1" thick for pipe sizes greater than 1" but less than 5".

D. Integrity of vapor-barrier jackets shall be maintained and protected to prevent puncture.

E. Valves, fittings and similar items in each piping system shall be covered with equivalent thickness and composition of insulation as applied to adjoining pipe run. Factory molded, pre-cut or job fabricated units shall be installed.

F. Pipe insulation shall butt against pipe hanger insulation inserts. For hot piping, 3" wide vapor barrier tape or band shall be applied over the butt joints. For cold piping, a wet coat of vapor barrier lap cement shall be applied on butt joints and joints sealed with 3" wide vapor barrier tape or band.

END 15430

DIVISION 15 - MECHANICAL
Section 15440- Plumbing Fixtures and Trim

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. All plumbing fixtures, trim, and accessories for sinks, lavatories, mop basins, water closets, urinals, floor drains, roof drains, electric water coolers, hose bibs, and special trim.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on plumbing fixtures.
- B. Color samples for selection by Landmark.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Maintenance instructions for electric water coolers.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Accessible fixtures shall comply with Americans with Disabilities Act (ADA) 1990-28 CFR Part 36 requirements.

1.5 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include plumbing fixture manufacturer's standard warranty coverage for plumbing fixtures and devices.
- C. Warranty: Include electric water cooler manufacturer's five (5) year refrigeration system warranty.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. All exposed piping and accessories shall be chrome plated.
- B. Traps shall comply with all applicable codes.
- C. Threaded traps shall have cleanout plugs.
- D. Plumbing fixtures shall have chrome plated, 17 gauge brass tube traps and tailpieces.
- E. All fixtures shall be provided with shutoff valves or stops
- F. All fixtures shall be provided with water risers. Exposed risers shall be rigid.
- G. The rims of stainless steel sinks shall be completely sealed against plastic laminate countertops with silicone sealant.
- H. ADA complying insulation shall be provided on fixture traps and water supplies. One of the following equal manufacturers and products may be used:
 - a. Truebro, "Lavshield Lavguard Enclosure" white color.
 - b. Additional approved equal products shall be considered.
- I. Some of the fixtures indicated in the following Plumbing Fixture Schedule will not be used on this project, but are included for reference in the case that they are added by a tenant suite build-out.

2.2 PLUMBING FIXTURE SCHEDULE

Fixture S-1; Sink for exam rooms in 18" deep base cabinet, shall be 15" x 15" x 6" deep single bowl stainless steel sink, 2 holes for fittings, wrist handle gooseneck faucet with aerator.

Elkay # (www.elkayusa.com)	Just # (www.justmfg.com)	Chicago Faucet # (www.chicagofaucet.com)	Zurn # (www.zurn.com)
a Fixture: BCR15	SL-1515-B-GR		
b Faucet: LK411ABH4		895-317XKCP	Z812A4
c Drain LK36	J-15-CC		

Fixture S-2; Sink for staff lounge shall be 21" x 33" x 7" deep double bowl stainless steel sink, 1 hole for fittings, single lever handle faucet 8" swing spout and aerator. One of the following equal manufacturers and products may be used:

Elkay # (www.elkayusa.com)	Just # (www.justmfg.com)	Chicago Faucet # (www.chicagofaucet.com)	Zurn # (www.zurn.com)
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- a Fixture: CR-3321 CDL-2133-B-GR
- b Faucet: LKE4160 2300-CP Z82300
- c Drain (2) LK35 (2) J-35

Fixture S-2A; Sink for staff lounge shall be 21” x 25” x 7” deep single bowl stainless steel sink, 1 hole for fittings, single lever handle faucet 8” swing spout and aerator. One of the following equal manufacturers and products may be used:

- | | Elkay #
www.elkayusa.com | Just #
www.justmfg.com | Chicago Faucet #
www.chicagofaucet.com | Zurn #
www.zurn.com |
|------------|---|--|--|--|
| a Fixture: | CR-2521 | CSL-2125-B-GR | | |
| b Faucet: | LKE4160 | | 2300-CP | Z82300 |
| c Drain | (2) LK35 | (2) J-35 | | |

Fixture S-3; Sink for nurse stations and laboratories, in 24” deep base cabinet, shall be 21” x 25” x 7 deep single bowl stainless steel sink, 2 holes for fittings, wrist handle gooseneck faucet with aerator. One of the following equal manufacturers and products may be used:

- | | Elkay #
www.elkayusa.com | Just #
www.justmfg.com | Chicago Faucet #
www.chicagofaucet.com | Zurn #
www.zurn.com |
|------------|---|--|--|--|
| a Fixture: | CR-2521 | CSL-2125-B-GR | | |
| b Faucet: | LK411ABH4 | | 895-317XKCP | Z812A4 |
| c Drain: | LK35 | JV35 | | |

Fixture S-4; Sink for special procedure rooms, in 24” deep base cabinet, where deep sink is required, shall be 22” x 25” x 12” deep single bowl stainless steel sink, 2 holes for fittings, wrist handle gooseneck faucet with aerator. One of the following equal manufacturers and products may be used:

- | | Elkay #
www.elkayusa.com | Just #
www.justmfg.com | Chicago Faucet #
www.chicagofaucet.com | Zurn #
www.zurn.com |
|------------|---|--|--|--|
| a Fixture: | DLR-252212 | SLXD-2225-A-GR | | |
| b Faucet: | LK411ABH4 | | 895-317XKCP | Z812A4 |
| c Drain: | LK35 | JV35 | | |

Fixture S-5; Scrub sink and faucet shall be provided by Tenant. Contractor shall install scrub sink, provide water and sanitary connections, provide p-trap, drain, tailpiece, water riser and shut off valves.

Fixture L-1; Lavatory for public ADA compliant toilet rooms, shall be 20” x 18” wall hung single bowl vitreous china sink, single lever handle faucet with aerator and open grid drain. Mount at 34” to top of front face, and provide Brocal trap wrap on waste and hot water supply pipes. ASSE 1070 compliant thermostatic mixing valve to temper hot water to faucet. One of the following equal manufacturers and products may be used:

- | American Standard #
www.us.amstd.com | Chicago Faucet #
www.chicagofaucet.com | Zurn #
www.zurn.com | Watts#
www.watts.com |
|---|--|--|--|
|---|--|--|--|

- a. Fixture: 0355.012
- b. Faucet: 2200-4CP Z81000
- c. Drain: Z8746
- d. Mixing Valve USG-B

Fixture L-2; Lavatory for exam rooms, labs, and other rooms, shall be 20" x 18" wall hung single bowl vitreous china sink, single lever handle faucet with gooseneck spout and open grid drain. Mount at 34" to top of front face. ASSE 1070 compliant thermostatic mixing valve to temper hot water to faucet. One of the following equal manufacturers and products may be used:

American Standard # www.us.amstd.com	Zurn # www.zurn.com	Watts# www.watts.com
---	--	--

- a. Fixture: 0355.012
- b. Faucet: Z81000
- c. Drain: Z8746
- d. Mixing Valve USG-B

Fixture L-3; Lavatory for private toilet rooms, shall be the same as L-2, except with a pop-up drain. One of the following equal manufacturers and products may be used:

American Standard # www.us.amstd.com	Zurn # www.chicagofaucet.com
---	--

- a. Fixture: 0355.012
- b. Faucet: Z81000-P
- c. Drain: Pop-up (included w/faucet)

Fixture L-4; Lavatory for private toilet rooms where countertop is provided, shall be 20" x 17" oval single bowl vitreous china sink, single lever handle faucet with aerator. One of the following equal manufacturers and products may be used:

American Standard # www.us.amstd.com	Zurn # www.zurn.com
---	--

- a. Fixture: 0476.028
- b. Faucet: Z81000-P
- c. Drain: Pop-up (included w/faucet)

Fixture L-5; Lavatory for public handicap toilet rooms where countertop is provided, shall be 20" x 17" oval single bowl vitreous china sink, single lever handle faucet with aerator. ASSE 1070 compliant thermostatic mixing valve to temper hot water to faucet. One of the following equal manufacturers and products may be used:

American Standard # www.us.amstd.com	Zurn # www.zurn.com	Watts# www.watts.com
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- a. Fixture: 0476.028
- b. Faucet: Z81000
- c. Drain: Z8746
- d. Mixing Valve USG-B

Fixture FRS-1; Flush Rim Sink for soiled utility rooms, shall be provided with a flush valve and a vacuum breaker as required by code. One of the following equal manufacturers and products may be used:

- | | American Standard #
(www.us.amstd.com) | Sloan #
(www.sloanvalve.com) | Chicago Faucet #
(www.chicagofaucet.com) | Kohler #
(www.kohler.com) |
|------------------------|---|---|--|--|
| a. Fixture: | 9504.010 | | | K-6676 |
| b. Faucet: | 8345.110 | | 814-VBCP | K-7309-5A |
| c. S.S. Rim
Guards: | 7832-017 (3) | | | K-8935 (3) |
| d. Flush Valve: | | 117-H-YJ | | |

Fixture MB-1; Mop Basin for janitor closets and mechanical rooms, shall be molded stone 24" x 24" mop basin with stainless steel or cast brass drain. One of the following equal manufacturers and products may be used:

- | | Zurn #
(www.zurn.com) | FIAT #
(www.fiatproducts.com) | Roberts Hamilton #
www.rh.com |
|------------------|---|--|--|
| a. Fixtures: | Z1996-24 | MSB-2424 | 64 |
| b. Hose Holder: | HH | 832-AA | 65-700 |
| c. Mop Hanger: | MH | 889-CC | 65-600 |
| d. Bumper Guard: | BV | E-77-AA | 63-401 |
| e. Faucet: | American Standard #
(www.us.amstd.com)
8344.112 | Zurn #
(www.zurn.com)
Z1996-SF | |

Fixture WC-1: Water Closet for ADA compliant toilet rooms, shall be 17" to 19" high with seat to meet ADA requirement, 1.5 or 1.6 gallon floor mounted water closet with elongated bowl and pressure assist flush. Order tank with flush handle on wide side or sink side of room. Seat shall be manufacturers standard to match water closet, with open front less cover solid plastic, self-sustaining with check hinge to meet ADA requirements. One of the following equal manufacturers and products may be used:

- | | American Standard #
(www.us.amstd.com) | Kohler #
(www.kohler.com) | Bemis #
(www.BemisSeats.com) |
|-------------|---|--|---|
| a. Fixture: | 2377.100 | K-3544 | |
| b. Seat: | | | 1955SSCT |

Fixture WC-2; Water Closet for Non-ADA compliant toilet rooms, shall be 14" (16" high with seat), 1.5 or 1.6 gallon floor mounted water closet with elongated bowl and pressure assist flush. Seat shall be manufacturers standard to match water closet, with open front less cover solid plastic self-sustaining with check hinge. One of the following equal manufacturers and products may be used:

	American Standard # (www.us.amstd.com)	Kohler # (www.kohler.com)	Bemis (www.BemisSeats.com)
a. Fixture:	2333.100	K-3458	1955SSCT
b. Seat:			

Fixture WC-3: Water Closet for ADA compliant toilet rooms where flush valve is required, shall be 17” to 19” high with seat to meet ADA requirements 1.5 or 1.6 gallon flush valve floor mounted water closet with elongated bowl. Mount flush valve flush handle toward wide side or sink side of room. Seat shall be manufacturers standard to match water closet, with open front less cover solid plastic, self-sustaining with check hinge to meet ADA requirements. One of the following equal manufacturers and products may be used:

	American Standard # (www.us.amstd.com)	Kohler # (www.kohler.com)	Bemis (www.BemisSeats.com)
a. Fixture:	3043.102	K-4368	
	Zurn # (www.zurn.com)	Sloan # (www.sloanvalve.com)	Delany # (www.coynedelany.com)
b. Flush Valve:	Z6000-WS1	111	F402-1
c. Seat:			1955SSCT

Fixture WC-4: Water Closet for ADA compliant toilet rooms where flush valve and wall mounted fixture is required, shall be 1.5 or 1.6 gallon flush valve wall mounted water closet with elongated bowl, mounted at 17” to 19” above the floor with seat to meet ADA requirement. Mount flush valve with flush handle toward wide side of room. Seat shall be manufacturers standard to match water closet, elongated seat with open front less cover solid plastic, self-sustaining with check hinge. One of the following equal manufacturers and products may be used:

	American Standard # (www.us.amstd.com)	Kohler # (www.kohler.com)	
a. Fixture:	2257.103	K-4330	
	Zurn # (www.zurn.com)	Sloan # (www.sloanvalve.com)	Delany # (www.coynedelany.com)
b. Flush Valve:	Z6000WS1	F402-1	F-402-1
c. Seat:			1955SSCT

Fixture U-1: Urinal for men’s ADA compliant public toilet rooms, shall be wall mounted with flush valve, install fixture 17” floor to rim. One of the following equal manufacturers and products may be used:

	American Standard # (www.us.amstd.com)	Kohler # (www.kohler.com)
a. Fixture:	6501.010	K-4972T
	Zurn #	Sloan #
		Delany #

	www.zurn.com	www.sloanvalve.com	www.coynedelany.com
b. Flush Valve:	Z6003-WS1	186-1	F451-1

Fixture EDF-1: Electric Drinking Fountain for public corridors, shall be wall mounted dual height electric stainless steel drinking fountains. Provide 115 volt receptacle, and a five year refrigeration warranty. One of the following equal manufacturers and products may be used:

	Elkay # www.elkayusa.com	Oasis # www.oasiscoolers.com	Acorn Aqua # www.acornaqua.com
a. Fixture:	EZTL8C	P8AMSL	A112108F

Fixture EDF-2; Electric Drinking Fountain for private use when EDF-1 is provided in public corridor, shall be wall mounted single height electric stainless steel drinking fountains. Provide 115 volt receptacle, and a five year refrigeration warranty. One of the following equal manufacturers and products may be used:

	Elkay # www.elkayusa.com	Oasis # www.oasiscoolers.com	Acorn Aqua # www.acornaqua.com
a. Fixture:	EZ8	P8AM	A111108F

Fixture SH-1: Shower for tenant suite, shall be 36" x 36" inside dimension, one piece, white fiberglass module, plywood backed and ready for grab bar and seat installation, stainless steel curtain rod, hand-held shower with vacuum breaker, and control valve, and collapsible removable water retainer at sill. Plumbing contractor shall set hot water limit safety stop to 100 degrees F. maximum. One of the following equal manufacturers and products may be used:

	Best Bath # www.fsidaho.com	Lasco Bathware # www.lascobath.com	FiberFab # www.fiberfab.com
a. Fixture:	LSS3838A5T	1363 BFSC	38BF
b. Faucet or Supply:	Included	Included	Provide Equal

Fixture SH-2: Shower for tenant suite, shall be 60" x 30" inside dimension, one piece, white fiberglass module, plywood backed and ready for grab bar and seat installation, stainless steel curtain rod, hand-held shower with vacuum breaker, and control valve, and collapsible removable water retainer at sill. Plumbing contractor shall set hot water limit safety stop to 100 degrees F. maximum. One of the following equal manufacturers and products may be used:

	Best Bath # www.fsidaho.com	Lasco Bathware # www.lascobath.com	FiberFab # www.fiberfab.com
a. Fixture:	LSS6333A75B	1603 BFSC	63BF
b. Faucet or Supply:	Included	Included	Provide Equal

Fixture FD-1: Floor Drain for toilet rooms, and other rooms with finish flooring, shall be chrome plated with strainer. One of the following equal manufacturers and products may be used:

	Zurn # (www.zurn.com)	Wade # (www.wadedrains.com)	Josam # (www.josam.com)	J.R. Smith # (www.jrsmith.com)
a. Fixture:	Z-415-C	W-1100-STD	30000-A	2005-A-NB

Fixture FD-2: Floor Drain for mechanical rooms, areaways, and other rooms with exposed concrete. One of the following equal manufacturers and products may be used:

	Zurn # (www.zurn.com)	Wade # (www.wadedrains.com)	Josam # (www.josam.com)	J.R. Smith # (www.jrsmith.com)
a. Fixture:	Z-550	1310	32100	2110

Fixture FD-3: Floor Drain for darkrooms, and other special applications, shall be floor drain with funnel. One of the following equal manufacturers and products may be used:

	Zurn # (www.zurn.com)	Wade # (www.wadedrains.com)	Josam # (www.josam.com)	J.R. Smith # (www.jrsmith.com)
a. Fixture:	Z-415-C w/ Z-328	W-1100-STD w/ EF4	30000-A w/ F4	2005-A-NB w/ 3580

Fixture ES-1; Emergency Shower for labs when required by code, shall be a plastic head type shower. Provide floor drain, FD-1 at shower. Stainless steel surface mounted thermostatic mixing valve w/temp. gauge, in surface mounted stainless steel cabinet. One of the following equal manufacturers and products may be used:

	Haws # (www.haws.com)	Guardian # (www.gesafety.com)	Leonard# (www.leonardvalve.com)
a. Fixture:	8122HWC	G1635	
b. Mixing Valve:			TA-600-STSTL-EXP

Fixture EEW-1; Emergency Eye Wash for labs when required by code, shall be a plastic head with 11" ABS plastic receptor, and aluminum wall bracket, for wall mounted type fixture. Stainless steel surface mounted thermostatic mixing valve w/temp. gauge, without cabinet, refer to drawing. One of the following equal manufacturers and products may be used:

	Haws # (www.haws.com)	Guardian # (www.gesafety.com)	Leonard # (www.leonardvalve.com)
a. Fixture:	7260B	G1814P	
b. Mixing Valve:			TA-300 or TA-300-STSTL-EXP

Fixture EEW-2; Emergency Eye Wash for labs when required by code, shall be a plastic head with 11” stainless steel receptor, for counter mounted type fixture. Thermostatic mixing valve w/temperature gauge. One of the following equal manufacturers and products may be used:

	Haws # (www.haws.com)	Guardian # (www.gesafety.com)	Leonard # (www.leonardvalve.com)
a. Fixture:	7301DM	G1810	TA-300

Fixture LS-1; Lab Sink for labs where acid resistance is required, shall be 22” x 25” single bowl stainless steel sink, 2 holes for fittings, wrist handle gooseneck faucet with aerator, and acid resistant tailpiece. One of the following equal manufacturers and products may be used:

	Elkay # (www.elkayusa.com)	Just # (www.justmfg.com)	Chicago Faucet # (www.chicagofaucet.com)	Kohler # (www.kohler.com)
a. Fixture:	LR-2522	SL-2225-A-GR-316		
b. Faucet:	LK411ABH4		895-317XKCP	K-7305-5A

Fixture LCS-1; Lab Cup Sink for labs where cup sink is required, shall be 3” x 6” oval (or 4” diameter), cup sink single bowl stainless steel sink, counter top mounted, wrist handle gooseneck faucet with aerator. One of the following equal manufacturers and products may be used:

	Elkay # (www.elkayusa.com)	Just # (www.justmfg.com)
a. Fixture:	CUPR4	A-41963

Fixture LDWC-1; Lab Distilled Water Cock, for labs, shall be polyvinyl chloride. One of the following equal manufacturers and products may be used:

	T& S Brass # (www.tsbrass.com)
a. Fixture:	BL-9510-2 (wall) BL-9515-1 (counter)

Fixture LGC-1; Lab Gas Cock, for labs, shall be serrated tip type. One of the following equal manufacturers and products may be used:

	T& S Brass # (www.tsbrass.com)
a. Fixture:	BL-4250-1 (wall) BL-4200-1 (counter)

Fixture LAC-1; Lab Air Cock, for labs, shall be serrated tip type. One of the following equal manufacturers and products may be used:

3.2 INSTALLATION

- A. Install plumbing fixtures in accordance with manufacturer recommendations.

3.3 ADJUSTING AND CLEANING

- A. If system is used during construction of the project, it shall be protected from damage.
 - a. All damaged parts or equipment shall be replaced prior to Substantial Completion and acceptance.
 - b. System shall be maintained, and left in like new operation prior to Substantial Completion and acceptance.
- B. Clean fixtures and adjust operating parts.

END 15440

DIVISION 15 - MECHANICAL
Section 15500- Basic Mechanical Requirements

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Mechanical systems basic requirements

1.2 BASIC MECHANICAL REQUIREMENTS

- A. Mechanical / HVAC Introduction: All HVAC equipment, ductwork, valves, controls, and other items shall be installed for a complete and working HVAC system.
- B. The HVAC system shall incorporate conveniences for maintenance and future remodeling.
- C. Quality Assurance and Regulatory Requirements:
 - a. The Mechanical system shall comply with all state and local building and mechanical codes and local ordinances used by the authority having jurisdiction.
 - b. The HVAC system design shall be based on the principals and data in the current American Society of Heating and Air Conditioning Engineers (ASHRAE) Handbook and Standards.
 - c. Comply with the latest published SMACNA, NFPA, NEMA and NEC Standards.
 - d. Comply with UL or other tested assemblies to maintain the code required fire ratings of the building, and as indicated in the Drawings.
 - e. Comply with code required seismic anchorage and support systems.

1.3 MECHANICAL SYSTEM CONCEPT – NON ASC PORTIONS OF BUILDING – MIDRISE BUILDING

- A. The HVAC system shall consist of variable volume packaged rooftop units with electric direct expansion (DX) cooling engineered for rooftop installation, serving a series of powered air terminal boxes and a plenum return air system.

- a. Variable volume packaged rooftop units shall generally be zoned one per floor on small buildings, to serve floor areas up to approximately 35,000 square feet.

*** OR ***

- b. Variable volume rooftop air handling units shall generally be zoned two per wing. Each unit serves several floor of that wing. There is a ducted crossover located on the top floor between the two units serving the wing to provide emergency redundancy in case one

AHU is out of service. Under this condition, one AHU will serve all floors of the entire wing at a reduced capacity.

- B. A gas furnace shall be provided in each rooftop unit for unoccupied night heating, and morning warm-up if the annual degree days exceed 2500 or the winter design temperature is less than forty (40) degrees Fahrenheit.
- C. Economizers shall be provided if the annual degree days exceed 2000.
- D. Perimeter zones shall be served by fan powered VAV terminal units. Interior zones shall be served by shut-off VAV terminals. Zones shall be provided for rooms with heating and cooling requirements sufficiently similar to enable design conditions to be maintained (an average of 3 zones per 1000 square feet of finished area).
- E. Perimeter and interior zone heating shall be accomplished by electric heating coils located in the terminal units.
- F. Duct Liner Locations:
 - a. All return air ducts including return air transfer ducts.
 - b. All supply and return ductwork within duct shafts.
 - c. All supply ductwork for a minimum of 15'-0" downstream from the outlet of the supply fan on all rooftop units.
- G. Flexible Duct Wrap Locations:
 - a. All supply air ductwork upstream of VAV boxes. At contractor's option, duct liner may be used in lieu of flexible duct wrap if ductwork is rectangular.
 - b. All round supply air ductwork downstream of VAV boxes.
 - c. Exhaust air ductwork within 15'-0" upstream of inlet of exhaust fan.
 - d. All outside air relief ducts.
 - e. All ductwork in unconditioned spaces.
- H. Rigid Duct Wrap Locations:
 - a. Insulate outside air ducts that are exposed in mechanical rooms with 2" rigid board insulation. Insulate all exposed supply ducts that are exposed in mechanical rooms with 2 1/2" rigid board insulation. Cover all insulation with white all service jacket.
- I. A microprocessor-based building management control panel shall index the rooftop units from "occupied" to "unoccupied" (night setback) cycle, the perimeter electric heating and rooftop air conditioning shall be locked out. The building shall be maintained at a reduced night temperature by means of intermittent operation of the gas fired furnace section in the

rooftop unit. Prior to morning occupancy, the building will be warmed to occupied space temperatures by operating the air handling system in the morning warm-up mode.

- J. Zones shall be controlled by wall mounted DDC space temperature sensors.
- K. A central exhaust system using rooftop power roof ventilators shall be provided for all toilet rooms, janitor closets and electrical closets with transformers.
- L. An independent split system will condition the elevator equipment room. The evaporator and thermostat / control will be wall mounted in the room.

**** OR ****

1.4 MECHANICAL SYSTEM CONCEPT – NON ASC PORTIONS OF BUILDING – HIGHRISE BUILDING

- A. The HVAC system shall consist of variable volume packaged rooftop air handling units with chilled water cooling engineered for rooftop installation, serving a series of powered air terminal boxes and a plenum return air system.
 - a. Variable volume rooftop air handling units shall generally be zoned two per wing. Each unit serves several floor of that wing. There is a ducted crossover located on the top floor between the two units serving the wing to provide emergency redundancy in case one AHU is out of service. Under this condition, one AHU will serve all floors of the entire wing at a reduced capacity.
- B. A gas furnace shall be provided in each AHU for unoccupied night heating and morning warm-up.
- C. Economizers shall be provided if the annual degree days exceed 2000.
- D. Perimeter zones shall be served by fan powered VAV terminal units. Interior zones shall be served by shut-off VAV terminals. Zones shall be provided for rooms with heating and cooling requirements sufficiently similar to enable design conditions to be maintained (an average of 3 zones per 1000 square feet of finished area).
- E. Perimeter and interior zone heating shall be accomplished by electric heating coils located in the terminal units.
- F. Duct Liner Locations:
 - a. All return air ducts including return air transfer ducts.
 - b. All supply and return ductwork within duct shafts.
 - c. All supply ductwork for a minimum of 15'-0" downstream from the outlet of the supply fan on all rooftop units.
- G. Flexible Duct Wrap Locations:

- A. All supply air ductwork upstream of VAV boxes. At contractor's option, duct liner may be used in lieu of flexible duct wrap if ductwork is rectangular.
- B. All round supply air ductwork downstream of VAV boxes.
- C. Exhaust air ductwork within 15'-0" upstream of inlet of exhaust fan.
- D. All outside air relief ducts.
- E. All ductwork in unconditioned spaces.
- H. Rigid Duct Wrap Locations:
 - a. Insulate outside air ducts that are exposed in mechanical rooms with 2" rigid board insulation. Insulate all exposed supply ducts that are exposed in mechanical rooms with 2 1/2" rigid board insulation. Cover all insulation with white all service jacket.
- I. A microprocessor-based building management control panel shall index the rooftop AHU's from "occupied" to "unoccupied" (night setback) cycle, the perimeter electric heating and rooftop chiller shall be locked out. The building shall be maintained at a reduced night temperature by means of intermittent operation of the gas fired furnace section in the rooftop unit. Prior to morning occupancy, the building will be warmed to occupied space temperatures by operating the air handling system in the morning warm-up mode.
- J. Zones shall be controlled by wall mounted DDC space temperature sensors.
- K. A central exhaust system using rooftop power roof ventilators shall be provided for all toilet rooms, janitor closets and electrical closets with transformers.
- L. An independent split system will condition the elevator equipment room. The evaporator and thermostat / control will be wall mounted in the room.

1.5 MECHANICAL SYSTEM CONCEPT FOR ASC PORTIONS OF BUILDING (ROOFTOP)

- A. The HVAC system shall consist of a constant volume roof mounted air handling unit with an associated condensing unit, direct expansion (DX) cooling, natural gas heating, and final filtration; serving a series of electric duct reheat coils and a ducted return air system.
- B. Humidification will be electric steam generating, serving certain medical spaces with minimum relative humidity requirements.
- C. A gas furnace shall be provided in each rooftop unit for unoccupied night heating, and morning warm-up.
- D. Economizer cooling shall be provided.
- E. Zones shall be served by electric reheat coils.

- F. Rectangular supply and return air ducts will be sheet metal. Duct liner shall be prohibited for supply ductwork.
- G. Ductwork shall be insulated as specified herein.
- H. A microprocessor-based building management control panel shall index the rooftop units from “occupied” to “unoccupied” (night setback) cycle, the perimeter electric heating and rooftop air conditioning shall be locked out. Airflow shall remain constant during the night cycle in order to maintain proper pressure relationships. The building shall be maintained at a reduced night temperature by means of intermittent operation of the gas fired furnace section in the rooftop unit. Prior to morning occupancy, the building will be warmed to occupied space temperatures by operating the air handling system in the morning warm-up mode.
- I. Zones shall be controlled by wall mounted DDC space temperature sensors.
- J. A central exhaust system using rooftop power roof ventilators shall be provided for all toilet rooms, janitor closets, soiled utility rooms, and similar spaces.

***** OR *****

1.6 MECHANICAL SYSTEM CONCEPT FOR ASC PORTIONS OF BUILDING (INTERIOR)

- A. The HVAC system shall consist of a constant volume air handling unit located in a mechanical room, a return fan, chilled water cooling from the roof mounted central chillers, and final filtration; serving a series of hydronic duct reheat coils and a ducted return air system.
- B. Gas high efficiency boilers shall be provided in the mechanical room to provide reheat for the duct mounted coils.
- C. Economizer cooling shall be provided.
- D. Zones shall be served by hydronic reheat coils.
- E. Rectangular supply and return air ducts will be sheet metal. Duct liner shall be prohibited for supply ductwork.
- F. Ductwork shall be insulated as specified herein.
- G. A microprocessor-based building management control panel shall index the AHU unit from “occupied” to “unoccupied” (night setback) cycle, the perimeter electric heating and rooftop AHU air conditioning shall be locked out. Airflow shall remain constant during the night cycle in order to maintain proper pressure relationships. The building shall be maintained at a reduced night temperature by means of intermittent operation of the gas fired furnace section in the rooftop unit. Prior to morning occupancy, the building will be warmed to occupied space temperatures by operating the air handling system in the morning warm-up mode.

- H. Zones shall be controlled by wall mounted DDC space temperature sensors.
- I. A central exhaust system using rooftop power roof ventilators shall be provided for all toilet rooms, janitor closets, soiled utility rooms, and similar spaces.

1.7 MECHANICAL SYSTEM DESIGN CONDITIONS

- A. The HVAC system for medical and general office areas shall be capable of maintaining room temperatures to 75 degree F. in the summer and 72 degree F. in the winter, based on the outdoor air conditions listed in ASHRAE Fundamentals Handbook to the contract project location.
 - a. Operating rooms shall be adjustable from 68 F. to 73 F.
- B. When climatic conditions are at or within design conditions, performance of the installed system shall not exceed a variation of the plus or minimum two (2) degrees F. from the inside design conditions listed above in rooms containing a sensor.
 - a. Design conditions shall be as tabulated in Table #1 of the most current copy of the ASHRAE Climatic Conditions for the United States and Canada.
 - b. The minimum summer outdoor air design temperature will be that listed as the 0.4% cooling dry-bulb data condition.
 - c. The maximum winter outdoor design temperature will be that listed as the 99.6% heating dry-bulb data condition.
- C. For the ASC, the HVAC system shall comply with the filtration, air change rates, relative room pressurization, humidity and temperature ranges for hospital areas, and for outpatient areas shall be as listed in the current version of the AIA Guidelines for Design and Construction of Hospitals and Health Care Facilities.
- D. Performance of the installed system shall not exceed a variation of ten (10) percent of design air volume.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site is ready for ductwork and piping installation.
- B. Elevations and locations of all points of connection as indicated on drawings are approximate and the Contractor shall establish elevations and locations of services in the field.
- C. Any anticipated offsets to avoid obstructions that are not shown on the drawings shall be noted.
- D. The Contractor shall check all measurements of equipment and shall be responsible for connections of his Work with the Work of other contractors (if any) in the building.
- E. Slight modifications (three-inch or less, in any direction) in the size of ductwork, dampers, diffusers, and other air distribution material shall be permitted but may not be of less cross sectional area than as shown on the plans. Modifications greater than three-inches in any direction shall require review with Engineer.
- F. Confirm location and space availability for access panels, service valves and drain valves.
- G. Confirm location and space availability of chases, joist spaces and beam clearances.
- H. Confirm electrical voltages, phase and other characteristics.

3.2 INSTALLATION

- A. Contractor shall cooperate with the other contractors so that construction may proceed without hindrance. Confer with other contractors regarding any Work that may affect this Work and arrange schedule so that components shall be installed in a natural sequence. Contractor shall be responsible for grading, fitting, joining or adjusting of his Work to all adjacent Work of other contractors.
- B. Sequence, coordinate and integrate installations of mechanical equipment and material for efficient flow of the Work.
- C. Coordinate positioning of large equipment prior to enclosing building or equipment room.
- D. Install Work to conform with reviewed shop drawings to greatest extent possible. Position finish components, such as air outlets and temperature controls, to achieve symmetry in ceiling and wall layouts.
- E. Ducts and piping shown on plan views shall be installed above finished ceilings of rooms shown unless otherwise specified. In mechanical spaces and similar unfinished areas, install ducts and pipes as high as possible unless otherwise specified.
- F. Piping installed at specified pitch shall generally take precedence of ductwork and other piping.

- G. Operation of doors, windows, lighting, Owner's equipment or fixtures shall not be hindered by position of ductwork or piping.
- H. Piping, tubing, and ductwork shall not be permitted above or through elevator equipment rooms, electrical rooms, telephone rooms or computer rooms without the approval of Landmark.
- I. In rated egress enclosures, such as stairways and exit passageways, only piping, tubing, and ductwork related to such spaces shall be permitted within these spaces.

3.3 ACCESS

- A. Installation shall allow access to all portions of equipment requiring routine service including:
 - a. Service, cleaning, inspection and lubrication as recommended by manufacturer
 - b. Replacement of renewable components as recommended by manufacturer
 - c. Visibility of all vents
 - d. All Dampers
 - e. Drain Valves
 - f. Name plate data
 - g. Automatic Dampers
 - h. Valves
 - i. Smoke Detectors
 - j. Sensors
 - k. Gauges
 - l. Motors and Motor Controllers
 - m. Pumps

3.4 PROTECTION

- A. Protect final installation from damage during construction period.
- B. All open sections of ducts exposed to construction dust and all grilles and diffusers shall be covered with cheesecloth.
- C. Open ends of all piping shall be kept closed during construction.

3.5 LUBRICATING

- A. Before any equipment is energized, it shall be lubricated according to manufacturer's instructions.
- B. Lubrication points that are concealed or are hard to reach shall have extended fittings to a point of easy access and shall be clearly marked.

END 15500.

DIVISION 15 - MECHANICAL
Section 15650- Portable Air Conditioning Units

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Portable air conditioning units to be installed in Telecom and Data Rooms.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate construction, component description, and dimensioned drawings of equipment provided in this section.
- C. Product Data: Provide service utility requirements and equipment performance data.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing and operating the equipment.
- B. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section and approved by equipment manufacturer.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Products Requiring Electrical Connection: Equipment shall be listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.6 WARRANTY

- A. Fully correct or replace defective equipment within a one-year period after date of installation.
- B. Warranty: Include manufacturer's standard warranty coverage for installed equipment.

1.7 MAINTENANCE SERVICE

- A. A maintenance and service contract, for execution by the Owner, shall be provided covering the period of one (1) year following installation of equipment. The maintenance shall include inspections, adjustments, cleaning, and parts and labor to keep equipment in proper operation.
- B. Perform maintenance work using competent and qualified personnel.

1.8 DEMONSTRATION

- A. Landmark, Owner, and Hospital personnel shall be instructed in the proper use, operation, and daily maintenance of the installed equipment.

PART 2 PRODUCTS

2.1 ROYAL SOVEREIGN SPACE COOLERS

- A. Royal Sovereign Space Cooler
 - a. Built in thermostat and humidistat.
 - b. Condensation Tank 'full' indicator and float switch that will automatically shut down the unit.
 - c. Automatic restart function in case of power failure.
 - d. Unit shall be self-evaporating requiring no remote condensate receiver or drain receptor.
 - e. Unit shall function properly while mounted directly against wall, requiring no service clearance on rear side.
 - f. Unit shall have a vertical condenser discharge located on top of unit and intakes located on the front.
- B. Royal Sovereign model ARP-9011TL. **(NO ALTERNATES WILL BE CONSIDERED)**

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that 'area of Work' is ready for work of this section.
- B. Verify that electrical power is complete and of the correct characteristics for the installed equipment.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Install equipment level and aligned with adjacent building walls.
- C. Power cord shall not be modified. Plug unit directly into GFI outlet.
- D. Discharge shall be vertical from top of unit using a rigid and straight single piece of PVC duct to plenum space above. Length of this duct shall not exceed manufacturer's specifications.
- E. Unit shall be shelf mounted with casters removed, shelf shall be mounted between 24" and 36" AFF and be no larger than the footprint of the unit. Shelf to have retaining rails on all sides not facing a wall. Shelf shall be able to support 150lbs.

3.3 ADJUSTING AND CLEANING

- A. If unit is stored on site during construction of the project, it shall be protected from damage.
 - a. All damaged parts or equipment shall be replaced prior to unit installation and acceptance.

END 15650.

DIVISION 15 - MECHANICAL
Section 15740- Air Terminal Units

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Variable volume fan powered terminals, variable air volume terminals, and variable air volume terminals with electric heat.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on all air terminal units and accessories:

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Include legible schematic of wiring diagrams of installed electrical equipment and changes made in the Work.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- B. Air terminals shall be installed to maintain required clearances for service.
- C. Units shall comply with requirements of NFPA 90A.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.6 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include manufacturer's standard warranty coverage for operating equipment and devices.

1.7 MAINTENANCE SERVICE

- A. A maintenance and service contract, for execution by the Owner, shall be provided covering the period of one (1) year following Substantial Completion. The maintenance shall include testing, inspections, adjustments, lubrication, cleaning, supplies, and parts and labor to keep equipment in proper operation.
 - B. Perform maintenance work using competent and qualified personnel under the supervision of the manufacturer or original installer.
- B. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

1.8 DEMONSTRATION

- A. Landmark, Owner, and Hospital personnel shall be instructed in the proper use, operation, and daily maintenance.
- B. Review emergency provisions, including emergency access and procedures to be followed at the time of failure in operation and other building emergencies.
- C. Train normal procedures to be followed in checking for sources of operational failures or malfunctions.

PART 2 PRODUCTS

2.1 TERMINAL UNITS

- A. Manufacturer: The Trane Corporation or approved equal. If Trane is used, send mechanical drawings to both the local Trane office and to Landmark's National Trane Representative listed below for both the main building system and for individual tenant suites as they become available. The drawings being sent to the National Representative will insure that the equipment quote will follow Landmark's national purchasing agreement guidelines.
 - a. Landmark National Trane Representative
Jay Kasmerchak
The Trane Company
11400 West Theodore Trecker Way
West Allis, WI 53214
(414) 266-5200
jkasmerchak@trane.com
- B. Variable Volume Fan Powered Terminals shall be Trane, "Model VPEF", or Titus, "Model TFS", pressure independent fan powered variable air volume terminals. Provided with air

- valves, factory installed electronic actuators, adjustable minimum and maximum CFM limits, DDC controller, space temperature sensor, and integral transformer for low voltage control.
- a. U.L. listed direct electric resistance open type heaters shall be factory installed with required safety cutout airflow switch, factory mounted disconnect switch, and with silent mercury contactors for each stage.
 - b. Units shall have a direct drive integral centrifugal fan with backdraft damper and a three-speed split capacitor fractional horsepower motor with factory furnished and mounted manual starters.
 - c. Units shall have factory installed 1/2" internal matt faced insulation except terminals downstream of 90% or higher efficiency filters which shall receive foil faced insulation.
- C. Variable Air Volume Terminals shall be Trane, "Model VCCF", or Titus, "Model DESV", pressure independent variable air volume terminals shall be provided with air valves, factory installed electronic actuator, adjustable minimum and maximum CFM limits, DDC controller and space temperature sensor.
- a. Units shall be provided with factory installed balancing dampers at each discharge tap except where duct configuration requires a Trane type "Z" arrangement.
 - b. Units shall have factory installed 1/2" internal matt faced insulation except terminals downstream of 90% or higher efficiency filters which shall receive foil faced insulation.
- D. Variable Air Volume Terminals with Electric Heat shall be Trane, "Model VCEF", or Titus, "Model DESV", pressure independent variable air volume terminals shall be provided with air valves, factory installed electronic actuator, adjustable minimum and maximum CFM limits, DDC controller, space temperature sensor and integral transformer for low voltage control.
- a. U.L. listed direct electric resistance open type heaters shall be factory installed with required safety cutout airflow switch, factory mounted disconnect switch, and with silent mercury contactors for each stage.
 - b. Units shall have factory installed 1/2" internal matt faced insulation except terminals downstream of 90% or higher efficiency filters which shall receive foil faced insulation.

2.2 ACCESSORIES

- A. Space temperature sensors; shall be Trane zone sensors with external dial temperature setting adjustment and two (2) hour override button.
 - a. Space temperature sensors installed in public areas shall have concealed adjustment.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.

3.3 ADJUSTING AND CLEANING

- A. If system is used during construction of the project, it shall be protected from damage.
 - a. All damaged parts or equipment shall be replaced prior to Substantial Completion and acceptance.
 - b. All filters shall be replaced.
 - c. System shall be maintained, and left in like new operation prior to Substantial Completion and acceptance.
- B. Start-up: Trane shall inspect, start, test, check and commission the air terminal units in accordance with Trane's published instructions.

END 15740

DIVISION 15 - MECHANICAL
Section 15780- Fans

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Power roof ventilators and exhaust fans.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on the exhaust fans:

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Include legible schematic of wiring diagrams of installed electrical equipment and changes made in the Work.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.6 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include manufacturer's standard warranty coverage for operating equipment and devices.

1.7 MAINTENANCE SERVICE

- A. A maintenance and service contract, for execution by the Owner, shall be provided covering the period of one (1) year following Substantial Completion. The maintenance shall include testing, inspections, adjustments, lubrication, cleaning, supplies, and parts and labor to keep equipment in proper operation.
- B. Perform maintenance work using competent and qualified personnel under the supervision of the manufacturer or original installer.
- C. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

1.8 DEMONSTRATION

- A. Landmark, Owner, and Hospital personnel shall be instructed in the proper use, operation, and daily maintenance.
- B. Review emergency provisions, including emergency access and procedures to be followed at the time of failure in operation and other building emergencies.
- C. Train normal procedures to be followed in checking for sources of operational failures or malfunctions.

PART 2 PRODUCTS

2.1 POWER ROOF VENTILATORS

- A. Power Roof Ventilators; shall be AMCA rated with centrifugal aluminum fan wheel, backwardly inclined, with NEMA approved open ball bearing, permanent split capacitor motor isolated from air stream in a separate compartment. Provided complete with the following:
 - a. Adjustable belt drive or direct drive depending on fan size.
 - b. Weatherproof disconnect switch.
 - c. Backdraft damper with seals and jambs and blades.
 - d. Spun aluminum weatherproof housing with aluminum birdscreen.
 - e. "U" spring compression rubber vibration isolators.
 - f. 12" high prefabricated curb complete with fiberglass insulation and sponge rubber mounting pad.
 - g. Soldered condensation pans shall be provided below roof ventilators.
 - h. One of the following equal manufacturers and products may be used:
 - i. Greenheck, "Model GB"
 - ii. Acme, "Model PV"

- iii. Cook, "Model ACEB"
- iv. Additional approved equal products shall be considered.

2.2 CABINET EXHAUST FANS

- A. Cabinet exhaust fans shall be AMCA rated with galvanized housing, sound absorbing insulation, outlet duct collar with integral spring loaded backdraft damper, forward curved wheel, square duct connection.
- B. One of the following equal manufacturers and products may be used:
 - a. Greenheck, "Model CSP"
 - b. Acme, "Approved equal product"
 - c. Cook, "Approved equal product"
 - d. Carnes, "Approved equal product"
- C. Capacity as scheduled.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.

END 15780

DIVISION 15 - MECHANICAL
Section 15820- Ductwork

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Ductwork, lining, flexible ductwork, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate the following information:
- B. Product Data: Provide data on the following items:

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with the following requirements;
 - a. SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."
 - b. NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems" and NFPA 90B "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."
 - c. Code required seismic anchorage and support.
 - d. Ductwork, tapes and sealant shall have a flame spread rating no greater than 25 and a smoke developed rating no greater than 50 when tested in accordance with ASTM E 84, UL 723 or NFPA 255.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Seismic Zone Criteria: Products specified below shall be modified to an alternate seismic design product of similar style, from the same manufacturer, to meet the applicable code.
- C. Fire Rated Assemblies: Ductwork, tapes and sealant shall have a flame spread rating no greater than 25 and a smoke developed rating no greater than 50 when tested in accordance with ASTM E 84, U.L. 723 or NFPA 255.

PART 2 PRODUCTS

2.1 DUCTWORK

- A. Rectangular Ductwork: Except as otherwise specified, ductwork shall be fabricated from galvanized sheet steel complying with ASTM A 527, in gauges and reinforcement complying with SMACNA "HVAC Duct Construction Standards. Weights of sheet shall be as follows:
- a. Up to 12" 26 gauge
 - b. 12" to 30" 24 gauge
 - c. 31" to 48" 22 gauge
 - d. 49" to 60" 20 gauge
 - e. 60" and over 18 gauge
- B. Round Ductwork; shall be spiral duct as manufactured by United Sheet Metal or Semco Manufacturing. Spiral duct shall be constructed of galvanized steel in the following minimum gauges:
- a. 3" to 8" 26 gauge
 - b. 9" to 22" 24 gauge
 - c. 24" to 36" 22 gauge
- C. Fiberglass Ducts: Transfer ducts and return air boots and elbows may be fiberglass, constructed of 475 EI ductboard. All joints and seams shall be sealed with heat activated tape with automatic bond indicator as recommended by the ductboard manufacturer equal to Manville Therm-Lock. Boards shall carry a U.L. Class I air duct label. One of the following approved manufacturers and products may be used:
- a. Owens-Corning, "475-FRK"
 - b. Manville, "475 Micro-Air"
 - c. Knauf
 - d. Certain-teed.
 - e. Additional approved equal products shall be considered.
- D. Flexible Ductwork: Duct to supply diffusers, and return air grilles shall be pressure rated for 6" and negative 1/2" water column. The maximum length of Flexduct shall be 4'-0" for return air grilles, inlets of VAV terminal units, and 10'-0" for supply diffusers.
- a. Flexduct shall be labeled U.L.-181 Class I air duct material with insulation meeting NFPA-90A.

- b. Flexduct liner shall be fastened to fittings with Panduit PLT8H or galvanized steel worm gear strap.
- c. Field fabricated Flexmaster flexible aluminum ductwork satisfying above criteria (U.L. labeling, insulation value, and pressure rating) may be used.
- d. One of the following approved manufacturers and products may be used:
 - i. Genflex, "G-30C high pressure; IL low pressure"
 - ii. Wiremold, "WK high pressure; WGC low pressure"
 - iii. Clevaflex, "KQ high pressure; DB low pressure"
 - iv. Additional approved equal products shall be considered.

2.2 DUCTWORK PRESSURE CLASSIFICATION

- A. Supply ductwork upstream of VAV terminal units shall be constructed for a minimum of 3" working pressure.
- B. Supply ductwork downstream of VAV terminal units shall be constructed for 1/2" working pressure.
- C. Return and exhaust ducts shall be constructed for 1" working pressure.

2.3 FITTINGS, SEAMS, AND ACCESSORIES

- A. Large Duct Seams: Rectangular ductwork with a side dimension of 42" or greater shall be joined using the Ductmate system. These ducts shall be flanged, gasketed and sealed, with bolted construction.
- B. Round Ductwork Fittings; shall be factory prefabricated, 20 gauge.
- C. Round Ductwork Seams: All round ductwork shall be joined and sealed with the United Duct Sealer and plastic backed tape as recommended by the manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify dimensions at the site, making field measurements and drawings necessary for fabrication and erection. Check plans showing work of other trades and consult with Landmark in the event of any interference.
- C. Make allowances for beams, pipes or other obstructions in building construction and for work of other contractors. Transform, divide or offset ducts as required, in accordance with SMACNA HVAC Duct Construction Standards, Figure 2-7, except do not reduce duct to less than six inches in any dimension and do not exceed an 8:1 aspect ratio. Where it is necessary to take pipes or similar obstructions through ducts, construct easement as indicated

in SMACNA HVAC Duct Construction Standards, Figure 2-8, Fig. E. In all cases, seal to prevent air leakage.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Ductwork shall be assembled and installed to achieve air-tight (5 percent leakage) systems. Ducts shall be rigidly supported with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and prevent buckling and satisfy seismic support requirements.
- C. Ductwork and other materials shall be supported from building structure and not from pipes, conduit, ceiling systems or other non-structural members.
- D. Where ducts pass through fire-rated floors, walls or partitions, firestopping shall be provided between duct and structure, in accordance with requirements of ASTM E 48 and UL-1479.
- E. Angle iron braces or stiffeners shall be provided as necessary for rigidity.
- F. Ductwork shall be installed as high above floors as possible to allow for maximum finished ceiling heights.
- G. Vertical supply ductwork shall be supported by galvanized angle iron riveted to duct sides supported from floor construction.
- H. Ducts shall be flanged for attachment of registers, grilles and diffusers.
- I. Inlet and discharge connections on rooftop units and power roof ventilators shall be made with Ventfabrics' "Ventglas" extra wide Metaledge fire retardant material. The flex connection shall be 4-3/4" long including 1" slack. The Metaledge strips shall be sealed to the duct and secured with bolts spaced on 3" centers.
- J. Flexible ducts shall be supported at all elbows.
- K. Install ducts communicating to the outdoors to pitch toward outside air intakes and drain to outside of building. Solder or seal seams to form watertight joints.
- L. Where two different metal ducts meet, the joint shall be installed in such a manner that metal ducts do not contact each other by using proper seal or compound.
- M. Install all motor operated dampers and connect to or install all equipment furnished by others.
- N. Do not install ductwork through dedicated electrical rooms or spaces unless the ductwork is serving this room or space.
- O. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- P. Provide adequate access to ductwork for cleaning purposes.

- Q. Provide temporary capping of ductwork openings to prevent entry of dirt, dust and foreign material.
- R. Protect diffusers, registers and grilles with plastic wrap or some other approved form of protection to maintain dirt and dust free and to prevent entry of dirt, dust and foreign material into the ductwork.
- S. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- T. Support ductwork in accordance with SMACNA HVAC Duct Construction Standards, Figure 4-4.
- U. Seal all duct, with the exception of transfer ducts, in accordance with SMACNA seal class "A"; all seams, joints, and penetrations shall be sealed.
- V. Except where serving a VAV box, install a manual balancing damper in each branch duct and for each diffuser or grille. The use of splitter dampers, extractors, or grille face dampers will not be accepted for balancing dampers.
- W. Hangers must be wrapped around bottom edge of duct and securely fastened to duct with sheetmetal screws or pop rivets. Trapeze hangers may be used at contractor's option.

3.3 ADJUSTING AND CLEANING

- A. If system is used during construction of the project, it shall be protected from damage.
 - a. All damaged parts or equipment shall be replaced prior to Substantial Completion and acceptance.
 - b. System shall be maintained, and left in like new operation prior to Substantial Completion and acceptance.

END 15820.

DIVISION 15 - MECHANICAL
Section 15840- Ductwork Accessories

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Dampers, access panels, turning vanes, and take-off fittings.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on dampers and access panels.

1.3 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- B. Perform Work in accordance with the following requirements;
 - a. Applicable portions of SMACNA "HVAC Duct Construction Standards, Metal and Flexible"
 - b. ASHRAE recommendations pertaining to construction of ductwork accessories.
 - c. NFPA 90A "Air Conditioning and Ventilating Systems".
- C. Fire and smoke dampers shall comply with U.L. Standard 555 and 555S.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 DAMPERS

- A. Volume Dampers: Single or multi-blade type volume dampers shall be provided in all supply, return or exhaust branch ducts. Volume dampers shall have positive locking mechanism and operating handle.
 - a. Where neither dimension of a damper exceeds 8", a single blade type volume damper constructed of twenty (20) gauge galvanized steel securely fastened with U bolts or welded to a 1/2" square cold rolled steel operating rod shall be provided.
 - b. Where either duct dimension exceeds 8", a multi-louver type damper controlled from a single point by connecting linkage shall be provided.

- c. Where round or oval supply ducts occur upstream of air terminal devices, a round volume damper shall be provided at each flexible duct connection to the sheet metal conical take off fitting upstream of each terminal unit.
 - d. One of the following equal manufacturers and products may be used:
 - i. Greenheck
 - ii. Ruskin
 - iii. Louvers and Dampers, Inc.
 - iv. Additional approved equal products shall be considered
- B. Fire and Combination Smoke / Fire Dampers: shall be fusible link actuated with 165 degree F. link, UL labeled and a rating as scheduled on the Drawings, per UL 555 and UL 555S. The minimum free open area of dampers shall be the duct clear area.
- a. Dampers shall be provided with the following:
 - i. Resettable Link
 - ii. Open Closed Indicator
 - iii. Factory supplied sleeve and retaining angles. Sleeve shall be minimum 16 gauge.
 - iv. Factory mounted actuator, UL listed
 - 1. 24 Volt power supply
 - 2. Spring return operation
 - 3. Closed fail direction
 - 4. Externally mounted unless otherwise reviewed with Landmark
 - 5. NEMA 1 enclosure
 - b. One of the following equal manufacturers and products may be used:
 - i. Greenheck
 - ii. Ruskin
 - iii. Louvers & Dampers, Inc. or
 - iv. Additional approved equal products shall be considered
- C. Smoke Dampers: shall be UL labeled and a rating as scheduled on the Drawings, per UL 555S. The minimum free open area of dampers shall be the duct clear area.
- a. Dampers shall be provided with the following:
 - i. Momentary Test Switch
 - ii. Open Closed Indicator
 - iii. Factory mounted actuator, UL listed
 - 1. 24 Volt power supply
 - 2. Spring return operation
 - 3. Closed fail direction
 - 4. Externally mounted unless otherwise reviewed with Landmark
 - 5. NEMA 1 enclosure
 - b. One of the following equal manufacturers and products may be used:
 - i. Greenheck

- ii. Ruskin
- iii. Louvers and Dampers, Inc.
- iv. Additional approved equal products shall be considered

2.2 ACCESSORIES

- A. Access Panels and Doors: Double cam gasketed access doors shall be provided in ductwork at all fire and smoke dampers. Doors shall be at least 18" wide, unless duct size is less and shall be at least 75 percent of the damper height. Access panels shall be provided at all concealed fire and smoke/fire dampers not otherwise accessible from ceiling space.
- B. Turning Vanes: All ductwork turns with square corners shall receive turning vanes. Where duct sizes are greater than two (2) square feet in area, acoustical turning vanes shall be installed in the first four elbows after supply fans, exhaust fans, and at each return air elbow. One of the following equal manufacturers and products may be used:
 - a. Ductmate Industries Inc.
 - b. Airsan Corp.
 - c. Dura Dyne Corp.
- C. Takeoff Fittings:
 - a. Where rectangular supply ducts occur upstream of air terminal devices, galvanized steel manufactured conical converging type spin-in duct collars shall be provided in flexible ductwork connections to sheet metal ductwork upstream of VAV boxes.
 - b. Galvanized steel manufactured spin-in duct collars with 45 degree extractors shall be provided in flexible ductwork connections to sheet metal ductwork downstream of VAV boxes.
 - c. All spin-in collars in .1 and .2 above shall be furnished with factory installed integral volume dampers with positive locking wing nut and operating handle.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section..

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Manual Volume Dampers: Install manual volume dampers in each branch duct and for each grille, register, or diffuser as far away from the outlet as possible while still maintaining accessibility to the damper. Install so there is no flutter or vibration of the damper blade(s).

- C. Turning Vanes: Install turning vanes in all rectangular, mitered elbows in accordance with SMACNA standards and/or manufacturer's recommendations.
- D. Fire Dampers: Install dampers in strict accordance with manufacturer's installation instructions. Install damper sleeves with retaining angles on both sides of rated partition. Connections of ductwork to fire damper assemblies to be as specified on the installation instructions. Where it is necessary to set dampers out from the rated wall, install a sleeve extension encased in two hour rated fire proofing insulation. Install an access door at each fire damper, located to permit resetting the damper replacing the fusible link.
- E. Smoke Dampers and Combination Fire/Smoke Dampers: Install smoke dampers in locations indicated on the drawings in accordance with the manufacturer's instructions. Install an access door adjacent to each damper for inspection and cleaning. Coordinate damper linkage with operators so the dampers are closed when the air system is not operating.
 - a. Install combination fire/smoke dampers as specified above for fire dampers. Coordinate damper linkage with operators so the dampers are closed when the air system is not operating.
- F. Control Dampers: Install dampers in locations indicated on the drawings, as detailed, and according to the manufacturer's instructions. Install blank-off plates or transitions where required for proper mixing of airstreams in mixing plenums. Provide adequate operating clearance and access to the operator. Install an access door adjacent to each control damper for inspection and maintenance.
- G. Smoke Detectors: Supplying, installing and wiring of detectors will be by the Electrical Contractor. Install an access door at each detector location. The Mechanical Contractor is responsible for installing the detector air sampling tube in the ductwork.
- H. Access Doors: Install access doors where specified, indicated on the drawings, and in locations where maintenance, service, cleaning or inspection is required. Examples include, but are not limited to motorized dampers, fire and smoke dampers, smoke detectors, fan bearings, heating and cooling coils, filters, valves, and control devices needing periodic maintenance..
 - a. Size and numbers of duct access doors to be sufficient to perform the intended service. Minimum access door size shall be 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, or other size as indicated. Install access doors on both inlet and outlet sides of reheat coils as well as other duct mounted coils.
- I. Duct Flexible Connections: Install at all duct connections to rotating or vibrating equipment, including air handling units (unless unit is internally isolated), fans, or other motorized equipment in accordance with SMACNA Figure 2-19.
- J. Louvers: Furnish louvers to the General Contractor for mounting in exterior walls. Connect outside air intake duct to the louver, sealing all connections air and water tight.
- K. Provide bird screen on outside of active louver area where none is provided with louvers. Where louvers are equipped with inside birdscreen, remove screen at all locations where duct connections are not made.

- a. Install insulated metal panel on unused portion of louver. Panels must be sealed weathertight to louver assembly with flashing as required for proper drainage to outside of building. Paint outside surface of panel to match louver prior to installation. Where ductwork is visible through louver when viewed from outside the building, paint inside of duct to match louver color.

END 15840

DIVISION 15 - MECHANICAL
Section 15860- Grilles and Diffusers

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Work Includes: Slot diffusers, ceiling grilles, sidewall grilles and registers.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on the grilles and diffusers.
- B. Color selection samples for grilles and diffusers.

1.3 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- B. Perform Work in accordance with NFPA 90A “Standard for the Installation of Air Conditioning and Ventilating Systems.”

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 DIFFUSERS AND GRILLES

- A. Slot Diffusers: for VAV supply air with internal acoustic insulation, integral duct collar and white finish, suitable for T-Bar or surface mounting.
 - a. Diffusers downstream of 90% or higher efficiency filters shall receive foil faced insulation in lieu of internal insulation (duct liner).
 - b. One of the following equal manufacturers and products may be used:
 - i. Trane, “VLSD and AABD”
 - ii. Titus, “T-Slot-In”
- B. Eggcrate Ceiling Grilles: shall be aluminum grid, aluminum boarder grilles provided for transfer grilles and plenum return grilles with white finish, suitable for surface installation in either drywall or acoustical ceilings.
 - a. Return air grilles shall be provided in rooms or areas where the supply CFM exceeds the return air capacity of the light fixtures as shown on Drawings.

- b. One of the following equal manufacturers and products may be used:
 - i. Titus, "Model 50F"
 - ii. Krueger,
 - iii. Price

- C. Ceiling Diffusers: shall be S80 steel grilles provided for exhaust grilles with white finish, suitable for surface installation in either drywall or acoustical ceilings.
 - a. One of the following equal manufacturers and products may be used:
 - i. Titus, "Model 23-RL"
 - ii. Krueger, "S80".

- D. Sidewall Grilles and Registers: shall be steel construction, horizontal pattern, white finish sidewall grilles and registers provided in areas without ceilings, such as stairs and multi-story lobbies.
 - a. Sidewall supply registers shall be double deflection type. Sidewall return grilles shall be single deflection type.
 - b. One of the following equal manufacturers and products may be used:
 - i. Titus
 - ii. Krueger

- E. Diffusers and Grilles for ASC Operating and Minor Procedure Rooms shall be aluminum grilles provided with white finish, suitable for surface installation in either drywall or acoustical tile ceilings. One of the following equal manufacturers and products may be used:
 - a. Titus, "350-FL"
 - b. Krueger, "approved equal product"
 - c. Additional approved equal manufacturers and products shall be considered

- F. Laminar flow type diffuser for ASC Operating and Minor Procedure Rooms shall be aluminum grilles provided with white finish, suitable for installation in either drywall or acoustical tile ceilings. One of the following equal manufacturers and products may be used:
 - a. Titus, "TLF-AA"
 - b. Krueger, "approved equal product"
 - c. Additional approved equal manufacturers and products shall be considered

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.

3.2 INSTALLATION

- A. Install grilles, registers and diffusers as shown on the Drawings and in accordance with manufacturer's instructions.
- B. Unless otherwise indicated, size ductwork drops to diffusers or grilles to match unit collar size.
- C. Seal connections between ductwork and diffusers / grilles airtight.

3.3 ADJUSTING AND CLEANING

- A. If system is used during construction of the project, it shall be protected from damage.
 - a. All damaged parts or equipment shall be replaced prior to Substantial Completion and acceptance.
 - b. System shall be maintained, and left in like new operation prior to Substantial Completion and acceptance.

END 15860

DIVISION 15 - MECHANICAL
Section 15880- HVAC System Insulation

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Duct insulation, vapor barrier, duct liner, jackets, coverings, sealers, mastic, adhesives, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on insulation, vapor barrier, duct liner, jackets, and coverings.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.
- B. Fire Rated Assemblies: Refer to drawings for rating and assembly requirements.
 - a. Provide duct insulation and liner which is identical in materials and construction as to the system tested.
 - b. Acceptable testing agencies include Underwriters Laboratories, Inc. and Warnock Hersey International, Inc.
- C. Composite duct insulation (insulation, jackets, coverings, sealers, mastics and adhesives) shall be provided with flame-spread index of twenty-five (25) or less, and smoke-developed index of fifty (50) or less, as tested by ASTM E 84 (NFPA 255).

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Armstrong World Industries, Inc.
- B. Certain Teed Corp.
- C. Knauf Fiber Glass GmbH.
- D. Johns Manville Products Corp.
- E. Owens-Corning Fiberglas Corp.

2.2 MATERIALS

- A. Material thickness; shall be provided to meet ASHRAE Standard 90.1 and all state and local codes.
- B. Rigid Fiberglass Ductwork Insulation: ASTM C 612, Class I.
- C. Flexible Fiberglass Ductwork Insulation: ASTM C 553, Type I, Class B-4.
- D. Jackets for Ductwork Insulation: ASTM C 921, Type I.
- E. Duct Liner: Fibrous glass, complying with Thermal Insulation Manufacturers Association (TIMA) AHC-101.
- F. Duct Liner Adhesive: Shall comply with ASTM C 916 "Specifications for Adhesive for Duct Thermal Insulation."
- G. Duct Liner Fasteners: Shall comply with SMACNA HVAC Duct Construction Standard, Article S2.11.

2.3 DUCT INSULATION

- A. Duct Liner: shall be 1" thick, 1 1/2 lb. Density liner. One of the following approved manufacturers and products may be used:
 - a. Owens-Corning, "Aeroflex Plus"
 - b. Johns Manville, "Permacote Linacoustic"
 - c. Knauf, "Duct Liner E.M.
 - d. Certainteed, "Ultralite"
 - e. Additional approved equal products shall be considered.
- B. Flexible Duct Wrap Insulation: 1-1/2" thick. Application limited to concealed locations. One of the following approved manufacturers and products may be used:
 - a. Owens-Corning, "Fiberglass all service faced duct wrap insulation"
 - b. Additional approved equal products shall be considered
- C. Rigid Board Insulation: 1-1/2" thick. One of the following equal manufacturers and products may be used:
 - a. Owens-Corning, "705 with FRK-25 foil reinforced kraft facing"
 - b. Additional approved equal products shall be considered

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Protect ductwork liner, flexible wrap and rigid boards from rain, weather and the construction activity while the material is storage on site, and after installation. Do not allow water to penetrate liner or insulation. Remove and replace any damaged liner, wrap or boards.

3.3 DUCT LINER

- A. Duct liner shall be applied with 100 percent adhesive coverage and mechanical fasteners located on 12” centers and within 2” of butted joints. A heavy coat of adhesive shall be applied at joints.
- B. All dimensions shown on drawings are clear inside dimensions. Increase ductwork sizes to accommodate liner.

3.4 DUCT FLEXIBLE DUCT WRAP

- A. Seal and tape all flexible duct wrap
- B. Secure duct wrap to the bottom of large ducts to prevent sagging.

3.5 SCHEDULE - DUCT LINER LOCATIONS

- A. All return air ducts including return air transfer ducts.
 - a. Ambulatory Surgical Centers, Imaging Centers, Laboratories and other similar tenant suites return air system shall be lined within 30’-0” of air handler only. All other return and supply air ductwork in these special outpatient suites shall be wrapped.
- B. All rectangular supply air ductwork downstream of VAV boxes.
- C. All supply and return ductwork within duct shafts.
- D. All supply ductwork for a minimum of 15’-0” downstream from the outlet of the supply fan on all rooftop units.
 - a. Do not use duct liner downstream of 90% or higher efficiency filters. Duct liner is not allowed for the entire ASC Tenant Suite air handler supply duct system.

3.6 SCHEDULE - FLEXIBLE DUCT WRAP LOCATIONS

- A. All supply air ductwork upstream of VAV boxes.

- a. At contractor's option, duct liner may be used in lieu of flexible duct wrap if ductwork is rectangular.
 - b. Wrap all rectangular supply air ducts and flexible connections downstream of 90% or higher efficiency filters.
 - c. Wrap all ductwork in Ambulatory Surgical Centers, Imaging Centers, Laboratories and other similar licensed and regulated outpatient services tenant suites.
- B. All round supply air ductwork downstream of VAV boxes.
 - C. Exhaust air ductwork within 15'-0" of discharge upstream of inlet of exhaust fan.
 - D. All outside air relief ducts.
 - E. All ductwork in unconditioned spaces

3.7 RIGID DUCT WRAP LOCATIONS

- A. Insulate outside air ducts that are exposed in mechanical rooms with 2" rigid board insulation. Insulate all exposed supply ducts that are exposed in mechanical rooms with 2 1/2" rigid board insulation. Cover all insulation with white all service jacket.

END 15880

DIVISION 15 - MECHANICAL
Section 15920- Direct Digital Control System

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. A complete direct digital control system for thermostatic control of air terminal, and automatic dampers, which interfaces with the microprocessor based Building Management System.
- B. The direct digital control system shall control all applicable equipment serving the medical office building, connectors, skywalks, and parking structure.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on the direct digital control system.

1.3 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- B. Perform Work in accordance with NFPA, NEMA and the NEC to maintain the required fire ratings of the building.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Direct Digital Control System; shall include miscellaneous electronic controls as required shall be provided for miscellaneous heating equipment control.
- B. Terminal unit space temperature sensors shall be supplied by the terminal unit manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area of Work is ready for work of this section.
- B. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install in accordance with manufacturer recommendations, and manufacturer's job-tailored wiring diagrams.
- B. Manufacturer's recommendations for low voltage wire gauges shall be followed based on length of runs.
- C. Communications wiring shall be Beldon 8760.
- D. Wiring shall be cable rated for use in return air plenums.

END 15920.

DIVISION 16 - ELECTRICAL
Section 16000- Basic Electrical Requirements

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electrical systems basic requirements

1.2 BASIC ELECTRICAL REQUIREMENTS

- A. Electrical: All raceways, circuits, conduits, power, lighting, fire alarm, and special electrical systems shall be provided for a complete operating electrical system
 - a. The Electrical system shall comply with all state and local codes.
 - b. Comply with applicable NEMA, National Electric Code, National Electrical Safety Code, NFPA 90A, AND utility company requirements.
 - c. Comply with code required seismic anchorage and support systems.
- B. Provisions for openings, holes and clearance through walls, floors and partitions, and the entire work to be carried out shall be accomplished without superfluous cutting. Oversized openings shall be caulked and sealed. Openings through fire rated construction shall be sealed with fire safing and fire resistant joint sealer meeting the requirements of ASTM E184.
- C. Anchors, inserts and supports shall be provided which are suitable for the application and required to accommodate materials and equipment.
- D. Unless shown on Drawings or specified herein, no special services, distribution or equipment hook-up is included for equipment not furnished under this Contract. Typical of equipment or systems not provided are: X-ray, dental units, refractory units, intercom, paging, music, direct current, and security systems.
- E. Rough-in requirements for Owner's special equipment shall be provided to Landmark and additional rough-in provisions shall be incorporated by Change Order.
- F. Identification: All electrical apparatus including power sources, operable devices, controls and other items established elsewhere in these Specifications shall be identified with Dymo, Brady or Avery labels describing usage, voltage and equipment (per OSHA).
 - a. UL Label: All equipment shall be UL listed, except for equipment for which UL has not an established test standard.
 - i. All electrical apparatus including power sources, operable devices, controls and other items established elsewhere in these Specifications shall be identified with Dymo, Brady or Avery labels describing usage, voltage and equipment (per OSHA).

- b. Each switchboard, motor control center, distribution panelboard, and lighting panelboard shall be identified with an engraved laminated plastic nameplate containing name of board and voltage/phase. Lettering shall be 1/4" high, white text on a black field for normal power, white text on red field for emergency power.
 - c. Each disconnect switch, enclosed motor starter, and combination disconnect/motor starter shall be identified with an engraved laminated plastic nameplate containing the name of the load served. Lettering shall be 1/4" high, white text on a black field for normal power, white text on red field for emergency power.
- G. Testing: The entire electrical system shall be started up and tested for proper operation, coordinated short circuit protection, proper grounding and resistance.
- H. Exposed painted surfaces of equipment or panels which have been abused, removed or rusted during construction shall be painted to match the original factory or adjacent finished surfaces.

END 16000.

DIVISION 16 - ELECTRICAL
Section 16100- Wires and Cables

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wiring and Cables

1.2 QUALITY ASSURANCE

- A. Wire shall be delivered to the job site in original cartons.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 MATERIAL

- A. Wiring Material and Application: All conductors shall be new, soft-drawn copper with 600 volt insulation, color coded as required by Code.
 - a. No. 10 AWG and smaller shall be solid or stranded.
 - b. No. 8 and larger wire shall be stranded copper.
 - c. In general, utilize type THW or THHN-THWN.
 - d. Feeders, all conductor No. 8 and larger and all conductors in or below ground floor slab: Type THWN.
 - e. Isolated power systems: XHHW
 - f. High temperature locations: Where ambient temperature conditions warrant, code grade type RHH or otherwise with insulation suitable for 90° C operating temperature.
 - g. Branch circuit wiring in fluorescent fixture channels: Type THHN No. 12 minimum.
- B. Solderless Connectors: Joints, taps and splices in conductors No. 10 and smaller shall be made with spring and compression type solderless connectors with plastic covers of type and size as recommended by the manufacturer. Joints, taps and splices in conductors No. 8 and larger shall be taped with vinyl providing insulation not less than that of the conductor and not less than two half-lapped layers each.
- C. Fire Alarm Wiring; shall comply with NEC Article 760 and state and local codes.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Service, feeder and branch circuit wiring shall be installed using color coded conductors as follows:

208/120V SYSTEMS		480/277V SYSTEMS		ALL SYSTEMS	
Phase A	Black	Phase A	Brown	Equipment Ground	Green Tracer
Phase B	Red	Phase B	Orange	Single & Three-Way Return	Orange Tracer
Phase C	Blue	Phase C	Yellow	Three-Way Traveler	Yellow Tracer
Neutral	White	Neutral	Gray		

- C. A minimum of 6" of looped or free end conductor shall be left at each outlet for the installation of devices or fixtures. Conductors in outlet boxes not for connection to devices or equipment shall be identified by circuit number and "spare" and coiled, with the cut ends insulated and taped together.
- D. Branch Circuit Sizing:
 - a. Branch circuit homeruns to panels from any outlet on the circuit shall be a minimum #12 AWG.
 - b. Exit lighting and emergency wiring shall be #12 AWG.
 - c. Conductors for branch circuits of 120 volts over 150' long and of 277 volts over 230' long shall be a minimum of #10 AWG.
 - d. Class 1 remote control and signal circuit conductors shall be minimum #14 AWG.
 - e. Class 2 low energy remote control and signal conductors shall be minimum #16 AWG.
 - f. Special signal, communications, or similar systems wires (cables) shall be sized as shown on Drawings or as required by the manufacturer.
 - g. Equipment grounding conductor shall be a minimum #12 AWG, as required by Code or as shown on Drawings.
- E. Parallel conductors shall be terminated on multiple barrel lugs or on a combination of multiple barrel lugs on a common bus. Under full load operating conditions, the division of the load between conductors shall be checked. Where load differential between any

two conductors of a phase exceeds ten (10) percent, corrective measures shall be taken to establish a load differential between conductors of less than ten (10) percent. A record of such tests shall be made for each feeder, indicating the conductor size, load in each conductor, voltage, and identification of feeder. Each test record, as well as retesting following corrective measures, shall be signed by the individual conducting and the individual witnessing the test.

- F. Conductor identification shall be provided for all feeder conductors within each enclosure where a tap, splice, or termination is made. Identification shall be by means of nylon marker ties, Type "PLM" as manufactured by Panduit Corporation.
- G. Insulated grounding conductors shall be provided for all convenience receptacles.
- H. Motors shall be grounded with a separate green equipment ground conductor routed via flexible metal conduit.

END 16100.

DIVISION 16 - ELECTRICAL
Section 16130 – Raceways and Boxes

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Conduits and boxes.

1.2 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Conduit; shall be galvanized rigid conduit, PVC conduit or EMT conduit and shall be installed in accordance with applicable building codes and this specification. One of the following equal manufacturers and products may be used:
 - a. Allied
 - b. LTV
 - c. Republic
 - d. Additional approved manufacturers shall be considered
- B. Boxes; shall be galvanized steel. Exterior boxes shall be type FS. Vapor tight boxes shall be GS. Boxes shall be sized per NEC Article 314. One of the following approved manufacturers may be used:
 - a. Appleton
 - b. Steel City
 - c. National Electric
 - d. Raco
 - e. Additional approved equal manufacturers may be considered

2.2 SYSTEM DESIGN AND INSTALLATION CRITERIA

- A. Heavy Wall Conduit; shall be used in or below concrete slab on grade, concrete walls, and exterior areas, and shall be galvanized, rigid (heavy wall) or intermediate metal (IMC)

conduit.

- B. PVC Conduit; shall be used in or below grade, and under concrete slab on grade, and shall be rigid, non-metallic conduit, schedule 40 PVC. PVC Conduit; shall be used mounted on concrete in parking structures.
- C. Thin Wall Conduit; shall be used in interior dry locations above grade and shall be electrical metal tubing (EMT or Thin Wall Conduit)
- D. Flexible Metal Conduit Connections; shall be used at recessed lighting and equipment in dry areas.
- E. Liquid-tight Flexible Metal Conduit; shall be used at connections to HVAC equipment, vibrating or moving equipment, and in all wet or corrosive areas.
 - a. Maximum 24" long flexible conduit connections shall be provided to HVAC air handling equipment and power roof ventilators.
- F. Fire Pump Rooms; shall utilize rigid metal conduit with liquid-tight flexible conduit at final connections.
- G. Service Entrance; shall utilize rigid metal conduit.
- H. PVC conduit; shall not be used in plenums.
- I. Minimum of 24" long flexible conduit connections shall be provided to HVAC air handling equipment and power roof ventilators.
- J. Three (3) 3/4" spare conduits shall be provided from each flush mounted panel board stubbed up to an accessible ceiling location.
- K. "Fish" wire shall be provided in all empty conduits.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. The complete raceway system shall be metallic and grounded so that the ground will be electrically continuous from the service to all outlet boxes.
- C. Conduit or boxes shall not be exposed except in unfinished areas or mechanical rooms.
- D. Conduit for roof mounted equipment, except for VAV rooftop units, shall be run inside the equipment's curb.
- E. Bends and offsets shall present a neat, symmetrical appearance and shall be rigidly secured in place.

- F. All components shall be sized in accordance with applicable code.
- G. PVC conduit runs shall have expansion fittings as required for temperature expansion per manufacturer's recommendations.
- H. Conduit shall not parallel streamlines, hot water pipes, flues and high temperature piping or ducts and shall cross these items with a minimum 6" clearance. Conduit shall not be routed over boilers or other high temperature equipment such that it will be in the path of hot air currents.
- I. Conduit passing between areas of different temperatures (i.e. exterior-interior) shall be sealed with duxseal at the outlet box at the point of penetration on the "warmer" side. Conduit and sleeve penetrations through floors or fire-rated walls shall be sealed with Fire Foam CTC PR-855.

3.2 SUPPORT OF CONDUIT AND CONDUCTORS

- A. All conduit shall be securely fastened to structural parts of the construction with supports at 8'-0" o.c. maximum and not more than 3'-0" from outlet boxes, junction boxes, pull boxes, cabinets and fittings, and at each elbow.
- B. Supporting devices shall be specifically designed for the application and the anticipated load. Perforated hanger iron and tie wire shall not be used.
- C. Conduit shall be supported with hot-dip galvanized channel and swivel threaded rod hangers and heavy duty pipe straps, clamps, clips and fasteners as manufactured by Unistrut, Bee-Line or Kindorf. Back straps shall be provided for all exposed conduit on exterior surfaces.

3.3 COUPLINGS, CONNECTORS AND FITTINGS

- A. Couplings, connectors and fittings shall be standard devices to properly attach conduit to conduit, to outlet boxes, panel enclosures, junction boxes, etc. Such devices shall be threaded, all-steel, rain tight and concrete tight, specifically designed for the application and bearing U.L. labels.
- B. All rigid steel conduit and IMC fittings shall be threaded type.
- C. All connectors shall have insulated throats. Connectors for use with flexible metal conduit shall be threaded type.
- D. Indentation type, set-screw type and push-on type fittings shall not be used for rigid steel, EMT or flexible metal conduits. Fittings with die-cast bodies, wholly or partially, shall not be used.

3.4 OUTLET BOXES

- A. Outlet boxes shall be provided as required to accommodate the intended device with the following minimum sizes:
 - a. Outlet boxes shall be 4" square, galvanized, set parallel to and independently attached to

construction and adjusted to set level with finished surfaces. Thru-wall or back-to-back outlets shall not be used. Flush type boxes shall be 1-1/2" deep.

- b. Ceiling boxes shall be 4" octagon by 2-1/8" deep and shall be supported with approved type box support channels.
- B. Raised covers with square corners and internally turned device hole plate continuous from end to end for mounting wiring devices shall be furnished for all flush mounted wall boxes. Flush wall outlet boxes shall include grounding terminal and must set flush with finished walls to establish ground continuity.
- C. FS or FD cast conduit bodies with weatherproof cast spring lid cover and gasket shall be provided for interior wet applications and boxes exposed to the exterior.
- D. Boxes shall be installed so that device covers are plumb and fit tightly against the adjacent wall finish.
- E. The maximum gap between the edge of the outlet box and adjacent plaster or gypsum board wall finish shall be 1/8".
- F. Outlet boxes installed within rated assemblies shall have appropriate sealing caulk or putty pads to maintain the rating of wall.

END 16130.

DIVISION 16 - ELECTRICAL
Section 16140- Wiring Devices

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Convenience outlets, switches, GFI protection, cover plates and supporting devices.

1.2 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 SWITCHES

- A. Switches in Medical Office Building; shall be twenty (20) amp, Specification Grade, ivory color, silent type, 3-wire, provided with grounding screw. One of the following equal manufacturers and products may be used:
 - a. Hubbell, "HBL 122X Series"
 - b. Leviton, "122X Series"
 - c. Pass & Seymour "PS20ACX Series"
 - d. Additional approved equal products shall be considered.
- B. Switches in Ambulatory Surgery and other licensed suites or "I" occupancy areas; shall be twenty (20) amp, Specification Grade, ivory color, silent type, 3-wire, provided with grounding screw. One of the following equal manufacturers and products may be used:
 - a. Hubbell, "HBL 122X Series"
 - e. Leviton, "122X Series"
 - f. Pass & Seymour "PS20ACX Series"
 - b. Additional approved equal products shall be considered.
- C. Keyed switches; shall be provided for public corridor lighting. Five keys shall be provided for each key switch.
- D. Occupancy Sensors: (used where required to satisfy energy codes)
 - a. Wall mounted: Leviton ODS15-ID, Watt Stopper WS200 or Lithonia LIRW.

- b. Ceiling mounted: Leviton ODC0S-17-W, Watt Stopper CI-200 (and appropriate power pack) or Lithonia LIRO (with power control station).
- c. Ceiling mounted in large toilet rooms: Leviton ODC10-UOW or equivalent by Wattstopper, Ultrasonic occupancy sensor.
- E. Digital Wall Switch Timers: Wall mounted, adjustable time-on interval, with warning signal prior to lights out. Novitas, "05-030" or approved equal manufacture and product.
- F. Toggle switches shall be quiet type.

2.2 COVER PLATES

- A. Exposed Cover Plates; shall be smooth ivory color. Blank cover plates shall be provided at all boxes which are not covered by device plates, or light fixture. One of the following equal manufacturers and products may be used:
 - a. Hubbell
 - b. Leviton
 - c. Pass & Seymour
 - d. Additional approved equal products shall be considered.
- B. Hidden Cover Plates; shall be 1/2" raised galvanized device in dry areas.
- C. Gang plates; shall be used for multiple device locations.
- D. Blank cover plates shall be provided for all boxes which are not covered by device plates or light fixtures.
 - a. 1/2" raised galvanized device covers shall be provided for exposed conduit boxes in dry areas.
- E. Gang plates shall be used for multiple device locations.

2.3 OUTLETS

- A. Convenience outlets and other wiring devices shall be twenty (20) amp Specification Grade, unless otherwise specified, ivory color.
 - a. Dedicated and computer outlets which shall be gray.
 - b. Emergency outlets which shall be red.
 - c. Wiring devices in Ambulatory Surgery or "I" occupancy areas shall be hospital grade.
- B. All specification grade convenience outlets shall be 3-wire, provided with grounding screws

as follows:

- a. Hubbell HBL 5362 Series
- b. Leviton 5362 Series
- c. Pass & Seymour 5362 Series

C. GFI Outlets:

- a. Exterior GFCI Outlets: Exterior outlets, and as required by code shall be weatherproof GFI protected outlets.
- b. Interior GFCI Outlets: Interior toilet room outlets, outlets adjacent to sinks, and other outlets as required by code shall be GFI protected outlets.
- c. Wire GFCI devices such that the downstream devices are not affected by ground fault interruption (non-feed thru). Each GFCI device shall be self protecting only.

- E. Tamperproof convenience outlets shall be provided in pediatric treatment areas and children play areas.

2.4 ACCESSORIES

- A. Supporting Devices; shall be catalog items compatible with and suitable for the intended use.
 - a. Stud wall supporting devices shall be Caddy, #H23, H4, HS3, or RBS16 quick mount box supports.

2.5 SYSTEM DESIGN AND INSTALLATION CRITERIA

- A. Convenience Outlet Location and Installation Criteria:
 - a. Private Offices, Consultation, Minor Surgery, Refractory or Special Procedure rooms - three total, located on three different walls.
 - b. Waiting rooms, Lounges, Sub-Waiting - located at 12' center to center on three different walls.
 - c. Toilets - one
 - d. Laboratory/Nurses Stations - spaced at 3' on center above the work counter except at sinks.
 - e. Dark Rooms - two on opposite walls.
 - f. Business/Reception Offices - two at reception window wall and one on opposite wall.
 - g. Exam, EKG, X-ray, Dental Operatory and all other Work rooms - two located on different walls.

- h. Three outlets shall be provided at building exterior.
 - i. Roof top outlets shall be provided in accordance with NEC 210-63.
- B. Switch Location and Installation Criteria
- a. One for each separate room.
 - b. One each for Waiting Room and Business Reception in Business Reception.
 - c. One for Public Corridors at each employee entrance/exit.
 - d. One at elevator lobbies on upper floor for public corridor lights.
 - e. One at main building entrance for ground floor lights.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Location of wiring devices shown on Drawings are approximate unless otherwise noted.
- C. Switches and outlets shall be mounted as follows (measured from floor to centerline of outlet) unless otherwise shown on Drawings:
 - a. Outlets mounted above countertops shall be mounted horizontally.
 - b. Outlets mounted above countertops without a backsplash shall be mounted 3" from countertop to center of outlet.
 - c. Outlets mounted above countertops with a backsplash shall be mounted 2" from top of backsplash to center of outlet.
 - d. Switches and occupancy sensors shall be located at 48" and within 12" of the latch side of the door serving the room that the switch is controlling.
 - e. Clock outlets shall be at 90".
 - f. All other outlets shall be mounted vertically at 18".
 - g. Electric drinking fountain outlets shall be mounted directly beneath the fountain so that cords are not visible.
- D. Switches, occupancy sensors and outlet boxes shall not be installed back to back in partitions separating rooms and wherever possible shall be in different stud spaces. Boxes located on opposite sides of fire rated partitions shall be separated by a minimum horizontal distance of 24" and be located in a separate stud space.

- E. Connections to wiring devices shall be made by the binding screws only.
- F. Receptacles shall have a bonding conductor from grounding terminal to the metal conduit system and to the equipment grounding conductor for the circuit.

END 16140

DIVISION 16 - ELECTRICAL
Section 16300- Circuits

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Circuits and over-current protection devices.

1.2 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Exterior Lighting Circuits: Tork 7302 ZL 3 pole single throw or equal Intermatic or Paragon time clocks shall be provided on separate circuits, for exterior lighting and for the water heater circulating pump.

2.2 SYSTEM DESIGN AND INSTALLATION CRITERIA

- A. 20 amp circuits shall be provided for convenience outlets with a maximum of 10 duplex receptacles per circuit.
- B. A maximum of three convenience outlets per 20 amp circuit shall be provided at laboratory work counters.
- C. Computer receptacle circuits shall be limited to a maximum of 5 duplex receptacles.
- D. Convenience outlet and lighting circuits shall not overlap different suites or departments.
- E. Dedicated circuits shall not share hot, neutral or ground wire with any other outlet or device.
- F. Green insulated equipment grounding conductor shall be provided for all feeders and branch circuits.
- G. Electrical rough-ins shall be labeled with voltage, phase and ampacity.
- H. 120 volt/20 amp lighting circuits shall be limited to a maximum of 1800 watts.
- I. 277 volt/20 amp lighting circuits shall be limited to a maximum of 4200 watts.
- J. Exit and night lights shall be circuited so that they remain illuminated at all times.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Duct smoke detector circuit shall be wired to shutdown respective mechanical equipment.

END 16300.

DIVISION 16 - ELECTRICAL
Section 16440- Motor Control

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Motor control devices including disconnects, starters, relays, contactors, controllers, pilot lights, and miscellaneous items required.

1.2 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Provide manufacturer's internal wiring diagrams.
 - d. Provide contractor's installation wiring diagrams.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 MOTOR CONTROLS

- A. Starters and contactors shall be included with the equipment, from the manufacturer or in not included, as manufactured by Square D or approved equal, and shall be installed by the electrical contractor.
- B. Thermal overload units for motor starters; shall be provided and properly sized per the motor nameplate full load amps and service factor rating.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.

END 16440.

DIVISION 16 - ELECTRICAL
Section 16500- Lighting Fixtures

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Lighting fixtures, trim, and accessories.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on lighting fixtures.
- B. Color samples for selection by Landmark.

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Maintenance instructions for electric water coolers.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for manufacture, product, and installation of system.

1.5 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include lighting fixture manufacturer's standard warranty coverage for lighting fixtures and devices.
- C. Warranty: Include manufacturer's standard two (2) year ballast guarantee

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. The basic catalog number only is indicated in the Lighting Fixture Schedule.
- B. Lighting fixtures shall be furnished with plaster frames, ends or caps, couplings, suspension

assemblies, mounting brackets and all auxiliary accessories as required.

- C. Fluorescent ballasts shall bear NEMA labels, be UL listed, and be ETL and CBM certified.
 - a. Ballasts shall be sounded rated "A" or better and be guaranteed for two years.
 - b. When double switching is shown on Drawings, fluorescent fixtures shall be provided with two (2) in lieu of one (1) ballast specified on the Fixture Schedule, or shall be provided with a master / slave ballast system.
- D. Ceiling mounted exit lights shall be installed so as not to conflict with the swing of hinged doors and closer arms.
- E. Fluorescent fixtures and fixture types E, K, L, P, V and W shall be ordered with proper voltage coordinated with lighting power distribution.
- F. Recessed fluorescent fixtures specified shall be modified for mounting when installed in other than lay-in acoustical ceilings.
- G. Recessed fixtures shall be served via flexible conduit with a separate green ground wire and solid ground at either end and shall include thermal protection in accordance with local and state codes.
- H. Some of the fixtures indicated in the following Lighting Fixture Schedule will not be used on this project, but are included for reference in the case that they are added by a tenant suite build-out.

2.2 LAMPS

- A. Fluorescent lamps; shall be T-8 cool white energy saving. Lamp types shall match at completion of the work. Lamps used during construction shall be replaced before the building is delivered to the Owner. All lamps shall have a minimum CRI of 76 and provide a minimum of 89 lumens per watt. All fluorescent lamps shall be 3500 degree K. extended life / reduced mercury type, or approved equal. One of the following equal manufacturers may be used:
 - a. Phillips
 - b. Sylvania
 - c. Additional approved equal manufacturers may be considered
- B. Incandescent lamps; shall be 130 VAC frosted and extended life type. One of the following equal manufacturers may be used:
 - a. General Electric
 - b. Phillips

- c. Sylvania
- d. Additional approved equal manufacturers may be considered

2.3 LIGHTING FIXTURE SCHEDULE

Fixture A; Fluorescent light with (4) lamps, for exam room, dental room, consultation office, private office, private toilets, waiting room, lab, minor surgery, special procedure, business office, work areas, and other similar rooms, shall be 2' x 4' prismatic acrylic lens in recessed white aluminum floating frame, with black reveal, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 4-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, "HRD 2 G C A V 4 32 A - EB81" (www.cooperlighting.com)
- b. Lithonia, "2SP G 4 D 32 RW A12 - 1/4 GEB APB" (www.lithonia.com) **GEB**
- c. Additional approved equal manufacturer and product may be considered.

Fixture A-1; Fluorescent light shall be similar to Fixture A, with battery power emergency back-up ballast. Lamp shall be 4-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, "HRD 2 G C A V 4 32 A - EB81 EM" (www.cooperlighting.com)
- b. Lithonia, "2SP G 4 D 32 RW A12 - 1/4 GEB APB EL4" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture A-2; Fluorescent light with (4) lamps, for special use rooms, offices, and large public rooms, shall be 2' x 4', 3" deep parabolic louver lens in recessed white aluminum floating frame, with black reveal, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 4-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, "HR 2 EP 3 G AX 4 32 S 48 I - EB81" (www.cooperlighting.com)
- b. Lithonia, "2PM3N G D 4 32 32 LD - 1/4 GEB APB" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture A-3; Fluorescent light similar to Fixture A-2, with battery power emergency back-up ballast. Lamp shall be 4-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, "HR 2 EP 3 G AX 4 32 S 48I - EB81 EL4" (www.cooperlighting.com)
- b. Lithonia, "2PM3N G D 4 32 32 LD - 1/4 GEB APB EL" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture A-4; Fluorescent light with (3) lamps to satisfy energy code, for exam room, dental room, consultation office, private office, private toilets, waiting room, lab, minor surgery,

special procedure, business office, work areas, and other similar rooms, shall be 2' x 4' prismatic acrylic lens in recessed white aluminum floating frame, with black reveal, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 3-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, "HRD 2 G C AV FA 3 32 A - EB81" (www.cooperlighting.com)
- b. Lithonia, "2SP G 3 D 32 RW A12 – 1/3 GEB APB" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture A-5; Fluorescent light shall be similar to Fixture A-4, with battery power emergency back-up ballast. Lamp shall be 3-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, "HRD 2 G C AV FA 332 A - EB81 EL4" (www.cooperlighting.com)
- b. Lithonia, "2SP G 3 D 32 RW A12 - 1/3 GEB EL APB" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture A-6; Direct/Indirect recessed fluorescent light upgrade for, suite waiting areas, corridors, consultation office, private office and other similar rooms, shall be 2' x 4' with white frame, metal diffuser with round holes, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 2-54W T5HO. One of the following equal manufacturers and products may be used:

- a. Lithonia, "2AV G A 2 54THO MDR 277 GEB115" (www.lithonia.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture A-7; Direct/Indirect recessed fluorescent light shall be similar to Fixture AI, with battery power emergency back-up ballast. Lamp shall be 2-54WT5HO. One of the following equal manufacturers and products may be used:

- a. Lithonia, "2AV G A 2 54THO MDR 277 GEB115 EL14" (www.lithonia.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture B; Fluorescent light with (2) lamps, for tenant suite corridors and hallways, shall be 2' x 2' prismatic acrylic lens in recessed white aluminum floating frame, with black reveal, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 2-U31. One of the following equal manufacturers and products may be used:

- a. Metalux, "HRD 2 G C A V FA 2 U6T8 - - EB81" (www.cooperlighting.com)
- b. Lithonia, "2SP G 2 D U31 RW A12 – GEB APB" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture B-1; Fluorescent light shall be similar to Fixture B, with battery power emergency back-up ballast. Lamp shall be 2-U31. One of the following equal manufacturers and products may be used:

- a. Metalux, “HRD 2 G C A V FA 2 U6T8 - - EB81 EL4” (www.cooperlighting.com)
- b. Lithonia, “2SP G 2 D U31 RW A12 - GEB APB EL” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture B-2; Fluorescent light with (2) lamps, for shell and core building corridors and hallways, shall be 2’ x 2’, 3” deep parabolic louver lens in recessed white aluminum floating frame, with black reveal, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 2-U31. One of the following equal manufacturers and products may be used:

- a. Metalux, “HRD 2 EP 3 G AX 2 U6T8 S 44 I - EB81” (www.cooperlighting.com)
- b. Lithonia, “2PM3N G D 2 U316 16 LD - GEB APB” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture B-3; Fluorescent light similar to Fixture B-2, with battery power emergency back-up ballast. Lamp shall be 2-U31. One of the following equal manufacturers and products may be used:

- a. Metalux, “HRD 2 EP 3 G AX 2 U6T8 S 44 I - EB81 EL4” (www.cooperlighting.com)
- b. Lithonia, “2PM3N G D 2 U316 16 LD - GEB APB EL” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture B-4; Direct/Indirect recessed fluorescent light upgrade for, waiting areas, consultation office, private office and other similar rooms, shall be 2’ x 2’ with white frame, metal diffuser with round holes, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 2-24W T5HO. One of the following equal manufacturers and products may be used:

- a. Lithonia, “2AV G A 2 24T5HO MDR 277 GEB10PS” (www.lithonia.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture B-5; Direct/Indirect recessed fluorescent light shall be similar to Fixture BI-2, with battery power emergency back-up ballast. Lamp shall be 2-54WT5HO. One of the following equal manufacturers and products may be used:

- a. Lithonia, “2AV G A 2 24T5HO MDR 277 GEB10PS EL14” (www.lithonia.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture C; Fluorescent light with (2) lamps, for tenant suite large (greater than 35 sf) storage or file rooms, shall be 1’ x 4’ prismatic acrylic lens in recessed white aluminum floating frame,

with black reveal, electronic ballast, and air supply / heat removal fixture used for plenum return air. Lamp shall be 2-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, “HR GPAVXR–232A–WDF–EB81” (www.cooperlighting.com)
- b. Lithonia, “SPGD232RWA12-GEB-APB” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture C-1; Fluorescent light shall be similar to Fixture C, with battery power emergency back-up ballast. Lamp shall be 2-F32. One of the following equal manufacturers and products may be used:

- a. Metalux, “HR GPAVXR–232A–WDF–EB81–EL4” (www.cooperlighting.com)
- b. Lithonia, “SPG 2 D 32R WA 12-EL-GEB-APB” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture D; Fluorescent light with (2) lamps, for stair floor and intermediate landings, shall be wall mounted, linear direct / indirect, prismatic lens fixture. Mount at 7’-2” above finish floor, typical, and 6’-0” at upper level landings. Lamp shall be 2-F32. One of the following equal manufacturers and products may be used:

- a. Linear, “D675 B 2 ET8 - AL WMT BW 4’-0”” (www.linearlighting.com)
- b. Litecontrol, “W ID 66N 2 4 T8 PAT.19 CWM” (www.litecontrol.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture D-1; Fluorescent light similar to Fixture D, with battery power emergency back-up ballast. Lamp shall be 2-U31. One of the following equal manufacturers and products may be used:

- a. Linear, “D675 B 2 ET8 - AL WMT BW 4’-0” EM” (www.linearlighting.com)
- b. Litecontrol, “W ID 66N 2 4 T8 PAT.19 CWM EF” (www.litecontrol.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture E; Exit light with LED source, for suites, stairs, and other non-public spaces, shall be ceiling and wall mounted, single or double face. Directional arrows and letter color as required by code. One of the following equal manufacturers and products may be used:

- a. Lithonia, “Quantum LQM Series” (www.lithonia.com)
- b. Sure-Lites, “CCX Series” (www.cooperlighting.com)
- c. McPhilben, “CXL Series” (www.mcphilben.com)
- d. Additional approved equal manufacturer and product may be considered.

Fixture E-1; Exit light similar to Fixture E, with battery power emergency back-up. Lamp shall be LED type. One of the following equal manufacturers and products may be used:

- a. Lithonia, “Quantum LQM EL N Series” (www.lithonia.com)
- b. Sure-Lites, “CCX Series” (www.cooperlighting.com)
- c. McPhilben, “CXXL Series” (www.mcphilben.com)
- d. Additional approved equal manufacturer and product may be considered.

Fixture E-2; Exit light with LED source, for public spaces including corridors, lobbies, and vestibules, shall be ceiling and wall mounted, single or double face, edge lit clear acrylic panel, brushed aluminum housing,. Directional arrows and letter color as required by code. One of the following equal manufacturers and products may be used:

- a. Lithonia, “Precise LRP Series” (www.lithonia.com)
- b. Sure-Lites, “ELX Series” (www.cooperlighting.com)
- c. McPhilben, “45 V Series” (www.mcphilben.com)
- d. Additional approved equal manufacturer and product may be considered.

Fixture E-3; Exit light similar to Fixture E-2, with battery power emergency back-up. Lamp shall be (2) F8T5. One of the following equal manufacturers and products may be used:

- a. Lithonia, “Precise LRP Series” (www.lithonia.com)
- b. Sure-Lites, “ELX Series” (www.cooperlighting.com)
- c. McPhilben, “45 V Series” (www.mcphilben.com)
- d. Additional approved equal manufacturer and product may be considered.

Fixture E-4; Exit light with LED source, for parking structure and other locations directly exposed to the weather, shall be ceiling and wall mounted, single or double face, extruded / cast aluminum with brushed / satin finish, stencil face, rated for damp locations. Directional arrows and letter color as required by code. Lamp shall be (2) 20W T 6 1/2. One of the following equal manufacturers and products may be used:

- a. Lithonia, “Extreme Series LED” (www.lithonia.com)
- b. Sure-Lites, “LED Series” (www.cooperlighting.com)
- c. McPhilben, “LED Series” (www.mcphilben.com)
- c. Additional approved equal manufacturer and product may be considered

Fixture E-5; Exit light similar to Fixture E-4, with battery power emergency back-up. Lamp shall be (2) 20W T 6 1/2. One of the following equal manufacturers and products may be used:

- a. Lithonia, “Estreme Series LED” (www.lithonia.com)
- b. Sure-Lites, “LED Series” (www.cooperlighting.com)
- c. McPhilben, “LED Series” (www.mcphilben.com)
- d. Additional approved equal manufacturer and product may be considered.

Fixture F; Fluorescent light with (2) lamps, for large unfinished areas, storage rooms, mechanical / electrical rooms, janitor closets, telecommunication closets, and other similar rooms, shall be 4’ industrial fixture with electronic ballast. Surface mounted

if ceiling existing, and chain hanger from structure if no ceiling exists. Lamp shall be 2-F32. Fixture to be supplied with plastic safety sleeve. One of the following equal manufacturers and products may be used:

- a. Metalux, “4 IA – 2 32 - EB81” (www.cooperlighting.com)
- b. Lithonia, “EJA 2 32 GEB” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture F-1; Fluorescent light shall be similar to Fixture F, with battery power emergency back-up ballast. Lamp shall be 2-F32. Fixture to be supplied with plastic safety sleeve. One of the following equal manufacturers and products may be used:

- a. Metalux, “4 IA – 2 32 - EB81 EL4” (www.cooperlighting.com)
- b. Lithonia, “EJA 2 32 GEB EL” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture H; Incandescent light with (1) lamps, for storage closets less than 50 s.f., shall be flat albalite lens recessed fixture. Lamp shall be 1-100W. One of the following equal manufacturers and products may be used:

- a. Halo, “H1T 10P” (www.cooperlighting.com)
- b. Lithonia, “LS7 FW7” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture H-1; Incandescent light with (1) lamps, for dressing cubical, dark rooms, x-ray rooms, and other similar rooms that required dimming, shall be regressed drop opal lens recessed fixture Lamp shall be 1-150W. One of the following equal manufacturers and products may be used:

- a. Halo, “H2T 26P” (www.cooperlighting.com)
- b. Lithonia, “LS9 CR9” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture H-2; Incandescent light with (1) lamps, for recessed entry into the suite, shall be scoop wall wash lens recessed fixture Lamp shall be 1-100W. One of the following equal manufacturers and products may be used:

- a. Halo, “H600T 1625 P” (www.cooperlighting.com)
- b. Lithonia, “LP6 6W1” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture H-3; Incandescent light with (1) lamps, for special use areas, nurse stations, and in ceilings up to 8’-0” high where low intensity lighting is desired, shall be coilex baffle recessed down light fixture Lamp shall be 1-R30, 75W. One of the following equal

manufacturers and products may be used:

- a. Halo, "H7T 310P" (www.cooperlighting.com)
- b. Lithonia, "LP6 6B" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture H-4; Incandescent light with (1) lamps, for special use areas, accent lighting in high ceilings, or in ceilings up to 8'-0" high where high intensity lighting is desired, shall be coilex baffle recessed down light fixture Lamp shall be 1-R40, 150W. One of the following equal manufacturers and products may be used:

- a. Halo, "H7T 410P" (www.cooperlighting.com)
- b. Lithonia, "LP6 6B4W" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture J; Fluorescent light with (2) lamps, for lobbies and vestibules with 10'-0" high ceilings, shall be 7 1/2" diameter open aperture with clear Alzak reflector (7 5/8" deep), recessed down light fixture Lamp shall be 2-18W F18 DTT (2700K). One of the following equal manufacturers and products may be used:

- a. Portfolio, "C72181H 7280LI" (www.cooperlighting.com)
- b. Lithonia, "AF1 18TRT 6AR" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture J-1; Fluorescent light with (2) lamps, fluorescent down light shall be similar to Fixture J, with battery power emergency back-up ballast. Lamp shall be 2-18W F18 DTT (2700K). One of the following equal manufacturers and products may be used

- a. Portfolio, "C7218EM 7280LI" (www.cooperlighting.com)
- b. Lithonia, "AF1 18TRT 6AR EL" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture J-2; Fluorescent light with (2) lamps, for lobbies with two story high ceilings, shall be 7 3/8" diameter open aperture with clear Alzak reflector (7 5/8" deep), recessed down light fixture Lamp shall be 2-26W F26 DTT (2700K). One of the following equal manufacturers and products may be used:

- a. Portfolio, "C72261H 7280LI" (www.cooperlighting.com)
- b. Lithonia, "AFV 26TRT 8AR GEB 10" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture J-3; Fluorescent light with (2) lamps, fluorescent down light shall be similar to Fixture J-2, with battery power emergency back-up ballast. Lamp shall be 2-26W F26 DTT (2700K). One of the following equal manufacturers and products may be

used:

- a Portfolio, “C7226EM 7280LI” (www.cooperlighting.com)
- b Lithonia, “AFV 26TRT 8AR GEB 10 ELR” (www.lithonia.com)
- c Additional approved equal manufacturer and product may be considered.

Fixture K; Metal halide light with (1) lamp, for exterior overhangs in soffits, shall be 6" diameter open aperture with Alzak reflector (11" deep), recessed down light fixture Lamp shall be 1-100W metal halide. One of the following approved manufacturers and products may be used:

- a Portfolio, “M7600T 740 44600 LI” (www.cooperlighting.com)
- b Lithonia, “AH 100M 6 AR” (www.lithonia.com)
- c Additional approved equal manufacturer and product may be considered.

Fixture K-1; Metal halide light with (1) lamp, for exterior single story canopies, high soffits and lobbies, shall be 9" diameter open aperture with Alzak reflector (15" deep), recessed down light fixture Lamp shall be 1-175W metal halide. One of the following approved manufacturers and products may be used:

- a Portfolio, “M7010T 750 55000 LI” (www.cooperlighting.com)
- b Lithonia, “AH 175M 9 AR” (www.lithonia.com)
- c Additional approved equal manufacturer and product may be considered.

Fixture K-2; Metal halide light with (1) lamp, for exterior two story canopies and lobbies, shall be 10" diameter open aperture with Alzak reflector (19" deep), recessed down light fixture Lamp shall be 1-250W metal halide. One of the following approved manufacturers and products may be used:

- a Portfolio, “M7015T 760 55050 LI” (www.cooperlighting.com)
- b Lithonia, “AH 250M 10 AR” (www.lithonia.com)
- c Additional approved equal manufacturer and product may be considered.

Fixture K-3; Indirect fluorescent outdoor light for use in canopy, length as indicated on the drawings, in standard color as selected by Landmark. Provide manufactures standard end kit for each fixture, as indicated on the Drawings. One of the following approved manufacturers and products may be used:

- a Elliptipar, “F164-T124 (139)-H-XX-2-V00” (www.elliptipar.com)
- b Additional approved equal manufacturer and product may be considered.

Fixture L; Metal halide light with (1) lamp, for Medical Office Building exterior wall mounted locations at entries and exits where a canopy or soffit do not exist, shall be shielded wall bracket mounted at 8'-0" above finish floor. Provide integral photocell. Lamp

shall be 1-70W metal halide. One of the following approved manufacturers and products may be used:

- a. Ruud, "E8407 D H P" (www.ruudlighting.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture L-1; Metal halide light with (1) lamp, for Parking Structure exterior wall mounted locations at entries and exits where a canopy or soffit do not exist, shall be shielded wall bracket mounted at 8'-0" above finish floor. Lamp shall be 1-70W metal halide. One of the following approved manufacturers and products may be used:

- a. Ruud, "E8407 D H" (www.ruudlighting.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture L-2; Incandescent light with (1) lamp, for Medical Office Building and Parking Structure exterior wall mounted locations at entries and exits where a canopy or soffit do not exist, and where battery power emergency back-up is required, shall be 6 volt battery unit mounted in stair or above ceiling, with two remote wall mounted heads at exterior on common junction box. Lamp shall be as provide. One of the following approved manufacturers and products may be used:

- a. Sure-Lites, "(2) ELA NX N0806T with AA1-0 and 6X 7 DW" (www.cooperlighting.com)
- b. Lithonia, "ELU 2P R0 W" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture L3; Exterior wall mount at Medical Office Building entrance at exit doors where no overhand exists with auxiliary quartz lamp option as noted on the plans. One of the following approved manufacturers and products may be used:

- a. Lithonia; "TWAC-70M-277-LP1 (www.lithonia.com).
- b. Additional approved equal manufacturer and product may be used.

Fixture N; Fluorescent light with (2) lamps, for Parking Structure elevator lobbies and stair landings, shall be 1' x 4' prismatic acrylic lens surface mounted, electronic ballast. Lamp shall be 2-F32. One of the following approved manufacturers and products may be used:

- a. Metalux, "MC 2 32 A EB81" (www.cooperlighting.com)
- b. Lithonia, "M 2 32 A12 GEB" (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture N-1; Fluorescent light shall be similar to Fixture N, with battery power emergency back-up ballast. Lamp shall be 2-F32. One of the following approved manufacturers and products may be used:

- a. Metalux, “MC 2 32 A EB81 EL4” (www.cooperlighting.com)
- b. Lithonia, “M 2 32 A12 GEB EL” (www.lithonia.com)
- c. Additional approved equal manufacturer and product may be considered.

Fixture P; HPS Parking lot pole and light fixture with (1) lamps, for interior of parking lots, shall be spaced approximately 150’ on center, and shall provide a minimum maintained illumination of .5 foot candles and an average maintained illumination of 1.5 foot candles. Single aluminum parking lot luminaire on 30’-0” straight round pole, factory finished fixture and pole in standard color as selected by Landmark. Lamp shall be 1-400W HPS. One of the following approved manufacturers and products may be used:

- a. Kim, “1A AR5 400 HPS fixture and KRS 30 5180 A BC4 pole” (www.kim.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture P-1; HPS Parking lot pole and light fixture with (1) lamp, for exterior perimeter of parking lots, shall be spaced approximately 180” on center, and shall provide a minimum maintained illumination of .5 foot candles and an average maintained illumination of 1.5 foot candles. Pole and fixture shall be similar to Fixture P, with long and narrow distribution (IES type III). Lamp shall be 1-400W HPS. One of the following approved manufacturers and products may be used:

- a. Kim, “1A AR3 400 HPS fixture and KRS 30 5180 A BC4 pole” (www.kim.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture P-2; HPS Parking lot pole and light fixture with (1) lamp, for exterior perimeter of top level of the Parking Structure , shall be spaced approximately 180” on center, and shall provide a minimum maintained illumination of .5 foot candles and an average maintained illumination of 1.5 foot candles. Single aluminum parking lot luminaire on 25’-0” straight round pole, in standard color as selected by Landmark, with long and narrow distribution (IES type III). Lamp shall be 1-400W HPS. One of the following approved manufacturers and products may be used:

- a. Kim, “1A AR3 400 HPS fixture and KRS 25 5180 A BC4 pole” (www.kim.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture R; HPS Parking Structure wall mounted light fixture with (1) lamp, for top level of the Parking Structure at exterior doors into stairs or elevator lobbies, shall be wall mounted cut-off light fixture, finish to match fixture P-2, or as selected by Landmark from manufacturers standard colors. Lamp shall be 1-150 HPS. One of the following approved manufacturers and products may be used:

- a. Kim, “WD 14 D4 150 HPS” (www.kim.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture S; HPS Sidewalk light fixture with (1) lamp, for exterior sidewalks where high intensity lighting is required, shall be spaced approximately 60” on center. Single aluminum luminaire on 10’-0” straight round pole, in standard color as selected by Landmark, with long and narrow distribution (IES type III). Lamp shall be 1-150W HPS. One of the following approved manufacturers and products may be used:

- a. Kim, “1SA SAR3 150HPS fixture and KRS 10 4120 SA BC4 pole” (www.kim.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture S-1; Metal Halide Sidewalk bollard light fixture with (1) lamp, for decorative lighting of walks which require low intensity lighting, shall be 42” high, 8” round aluminum bollard, factory finished in standard color as selected by Landmark. Lamp shall be 1-100 W metal halide. One of the following approved manufacturers and products may be used:

- a. Kim, “VRB1 100 MH” (www.kim.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture U; Incandescent utility light fixture with (1) lamp, for elevator shafts, and other similar areas, shall be lamp holder with light bulb guard. Lamp shall be 1-CFQ 18W. One of the following approved manufacturers and products may be used:

- a. Hubbell, “NVQ with NVB and NVG” (www.hubbel.com)
- b. Bryant,
- c. Leviton,
- d. Pass,
- e. Additional approved equal manufacturer and product may be considered.

Fixture V; Under cabinet fixture solid front fixture located in various areas with electric ballast. Lamps shall be 32W T8 type. Surface mounted under cabinet. One of the following approved manufacturers and products may be used:

- a. Lithonia “N2S Series” (www.lithonia.com)
- b. Additional approved equal manufacturer and product may be considered.

Fixture UC; Fluorescent undercabinet light with (1) lamp, 17 watts. * (Size of lamp may vary per drawings)

- a. Lithonia: 2UC-17-MVOLT-GEB101S
- b. Bryant
- c. Leviton
- d. Pass

- e. Additional approved equal manufacturer and product may be considered.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that electrical power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install lighting fixtures in accordance with manufacturer recommendations.
- B. For fire rated ceilings, 2 'x 2' or 2' x 4' fixture to be provided with UL rated TenMat fire rated fixture cover Model FF130.
- C. For fire rated ceilings, down lights to be provided with UL rated TenMat fire rated fixture cover Model FF109-300.

3.3 ADJUSTING AND CLEANING

- A. If system is used during construction of the project, it shall be protected from damage.
 - a. All damaged parts or equipment shall be replaced prior to Substantial Completion and acceptance.
 - b. System shall be maintained, and left in like new operation prior to Substantial Completion and acceptance.
- B. Clean fixtures, replace bulbs, and adjust operating parts.

END 16500

DIVISION 16 - ELECTRICAL
Section 16530- Fire Alarm Systems

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire alarm system including control panel, remote annunciator, and devices as required.
- B. Fire alarm shall include voice / alarm communication system and two-way Fire Department Communications system for high rise building requirements.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on the fire alarms system components:

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Include legible schematic of wiring diagrams of installed electrical equipment and changes made in the Work.
 - d. Include manufacturer's installation instructions.
 - e. Include manufacturer's local representative and/or distributor's name and address.
 - f. Include typed panel directory included in each fire alarm panel.
 - g. As-built fire alarm control panel drawings indicating area served by each circuit so circuit maximization can be verified.
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Installer: Company specializing in performing the work of this section and approved by fire alarm equipment manufacturer.
- B. Perform Work in accordance with the following requirements;

- a. Applicable local and state codes,
- b. The National Electric Code,
- c. NFPA 72A.
- d. Americans with Disabilities Act (ADA) 1990-28 CFR Part 36

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

1.6 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include manufacturer's standard warranty coverage for operating equipment and devices.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. System Components: The specification is based on Notifier (Honeywell) components to establish function, quality and style. Equal products may be used from one of the following approved equal manufacturers:
 - a. Edwards System Technology, Inc. (EST), unit of GE Security.
 - b. Johnson Controls
 - c. Siemens Cerberus Division
 - d. Simplex Time Recorder Co.

2.2 COMPONENTS OF SYSTEM

- A. Control panel; shall be Notifier 3032-voice, 120V single-phase, 60HZ with features as follows:
 - a. Operator interface switches behind locked door: system reset, system alarm silence, system trouble silence, acknowledge/next, drill/all call, lamp test and review.
 - b. Visual LED indicators for: system normal, system alarm, supervisory, test/program, alarm silence, trouble silence and drill/all call.
 - c. Visual LCD indicators for: time, number of active points in system and number of

disabled points in system. In alarm mode, LCD shall indicate the time, the alarm zone and the time that the alarm occurred.

- d. Off-site monitoring output capability of remote fire department or central station reverse polarity, local energy master box or shut master box shall be field-selectable in the control panel. A modem for remote dial up shall be provided.
 - e. Metal Oxide Varistors (MOV) on system power supply and municipal connection circuit for transient suppression protection to control panel.
 - f. Bypass switch to permit testing without changing condition of remote functions.
 - g. Signal circuit boards shall be rated for 2 amp output and shall be provided in sufficient quantity for a fully developed building.
 - h. ZBO-8 relay(s) for powering the remote enunciator.
 - i. Integral batteries and associated charger shall be sized to provide 24-hour backup with five minutes of alarm minimum for a fully-developed building.
- B. Termination boxes; shall consist of a junction box with hinged cover and screw-type terminal block.
- D. Devices:
- a. Elevator smoke detector: Model FSP-85IRP
 - b. Manual pull station: Model NBR-12LX
 - c. Speaker strobe: Model SP2R1224 MC, semi-flush mount.
 - d. Strobe: Model 51224 MC
 - e. Duct smoke detector: Model FSD-751P with sampling tube. Length of tube should adequately span across duct.
 - f. Smoke detector: Photo electric Model FSP-851
 - g. Smoke detector; Ionization Model FSI-851
 - h. Electro-magnetic door holder: Rixson No. 998; 24 volt, or approved equal.
- E. Conductors; shall be UL listed and labeled for use as fire alarm cable. Conductors shall be color coded as follows:
- a. Power branch circuit: Black, red and white.
 - b. Initiating device: Black and red.

- c. Signal device: Blue (positive) and white (negative).
- F. Conduit; shall be provided if required by governing code.
- G. Flow and tamper switches; shall be provided by the Fire Protection contractor.

2.3 COMPONENT REQUIREMENTS

- A. Manual pull stations: Shall be fabricated of metal or plastic, finished in red with molded, raised-letter operating instructions of contrasting color and shall include:
 - a. Double-action mechanism to require two actions, such as a push and a pull, to initiate an alarm.
 - b. Station reset: Key or wrench operated; double pole, double throw switch rated for the voltage and current at which it operates.
 - c. Integral addressable module: Arranged to communicate manual-station status (normal, alarm, or trouble) to the FACP.
- B. Automatic Smoke Detectors: Smoke detectors shall include the following features:
 - a. 24-V dc, nominal, operating voltage
 - b. Detectors shall not require resetting or readjustment after actuation to restore them to normal operation.
 - c. Detector and associated electronic components shall be mounted in a module that connects in a tamper-resistant manner to a fixed base with a twist-locking plug connection. Terminals in the fixed base shall accept building wiring.
 - d. LED type light shall indicate that the detector has operated.
 - e. Sensitivity shall be capable of being tested and adjusted in place after installation.
 - f. Integral addressable module shall be arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
 - g. Detectors shall be the analog addressable type, individually monitored at the FACP for calibration, sensitivity, and alarm condition, and individually adjustable for sensitivity from the FACP.
 - h. Photoelectric smoke detectors shall include the following features:
 - i. LED or infrared light source with matching silicon-cell receiver
 - ii. Detector Sensitivity shall be between 2.5 and 3.5 percent/foot smoke obscuration when tested according to U.L. 268A.
 - iii. Fixed-temperature type Integral Thermal Detector with 135 deg F setting.

- i. Ionization detectors shall include the following features:
 - i. Responsive to both visible and invisible products of combustion.
 - ii. Self-compensating for changes in environmental conditions.
 - iii. Duct smoke detectors-ionization type:
 - Sampling Tube: Design and dimensions shall be as recommended by the manufacturer for the specific duct size, air velocity, range, temperature and humidity for the applicable installation conditions where applied.
 - Relay Fan Shutdown: Shall be rated to interrupt fan motor-control circuit.
 - Heat detector-combination type: Shall be activated by either a fixed temperature of one hundred thirty five (135) degrees Fahrenheit or rate of rise of temperature that exceeds fifteen (15) degrees Fahrenheit per minute, unless otherwise indicated on Drawings with the following features:
 - Mounting: Adapter plate for outlet box mounting. Plug-in base, interchangeable with smoke detector bases.
 - Integral Addressable Module: Shall be arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
- C. Notification appliances: Devices shall be equipped with screw terminals for system connections. Combination devices shall be factory-integrated audible and visible devices in a single-mounting assembly.
- a. Speakers; Low profile mount speakers.
 - b. Strobes; Xenon strobe lights listed under UL 1971 with clear or nominal white polycarbonate lens, mounted on an aluminum faceplate. The word "FIRE" shall be engraved in minimum 1" high letters on the lens.
 - i. Rated light output; Multi-candela (15, 30, 75 and 110 cd) as required to satisfy NFPA 72.
 - ii. Strobe lead; Factory connected to screw terminals.
 - c. Speaker / Strobe; The low profile wall mounted speaker / strobe with multi candela strobe.
- D. Heat detectors shall be 160 degree Fahrenheit and shall be provided in boiler rooms, at each sprinkler head location in elevator shafts and as indicated on the Drawings.
- E. Remote device location indicating lights: LED indicating light shall be provided near each concealed initiating device.
- F. Magnetic door holders: Units shall be wall or surface mounted unless otherwise indicated on Drawings and shall be complete with matching door plate in US 26D finish.
- a. Electromagnet: Shall require no more than 3 W to develop 25-lbf holding force.
 - b. Rating: 24-V ac or dc.

G. FACP:

- a. The FACP shall be sized for a fully developed building. The number of signal circuits shall be based on one per 2,000 square feet of "Suite Area" plus circuits as required for public areas.
- b. Cabinet shall be a lockable steel surface mounted enclosure. The interior components shall be arranged so operations required for testing or for normal maintenance of the system can be performed from the front of the enclosure. If more than one cabinet is required to form a complete control panel, fabricate with matching modular unit enclosure to accommodate components and to allow ample gutter space for field wiring and interconnecting panels. Identify each enclosure with an engraved, red, laminated, phenolic-resin nameplate with lettering not less than 1 inch high. Identify individual components and modules within cabinets with permanent labels.
- d. Alarm and supervisory systems shall be separate and independent in the FACP. Alarm-initiating zone boards shall consist of plug-in cards which shall not require removal of field wiring for module replacement.
- e. Control modules shall be of the type and capacity required to perform all functions of fire alarm system.
- f. Indications: Local, visible and audible signals shall announce alarm, supervisory and trouble conditions. Each type of audible alarm shall have a different sound.
- g. Resetting controls shall prevent the resetting of alarm, supervisory, or trouble signals while the alarm or trouble condition still exists.
- h. Alphanumeric display and system controls shall be arranged for interface between a human operator at the FACP and addressable system components, including annunciation, supervision, and control.
 - i. Display: A minimum of eighty (80) characters; alarm, supervisory, and component status messages; and indicate control commands to be entered into the system for control of smoke detector sensitivity and other parameters.
 - ii. Keypad: Arranged to permit entry and execution of programming, display, and control commands.
- j. A printed or typewritten instruction card shall be mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. The functional operation of the system under normal, alarm, and trouble conditions shall be briefly described.

H. Remote annunciator:

- a. Annunciator functions shall duplicate the FACP functions for alarm, supervisory, and trouble indications. Manual switching functions of the FACP shall also be duplicated including acknowledging, silencing, reset, and test.
 - b. The alphanumeric display shall be identical to the FACP. Controls with associated LEDs shall permit acknowledging, silencing, resetting, and testing functions for alarm, supervisory, and trouble signals identical to those in the FACP.
- I. Emergency power supply:
- a. Components shall include a nickel-cadmium battery, charger, and an automatic transfer switch. Battery nominal life expectancy shall be a minimum of twenty (20) years.
 - b. Battery capacity shall comply with NFPA 72.
 - c. Unit shall be sized to power all required devices on the system and also operate the HVAC smoke dampers at 24 VDC.
 - d. Battery charger shall be solid-state, fully automatic, variable-charging-rate type. Provide capacity for one hundred fifty (150) percent of the connected system load while maintaining batteries at full charge. If batteries are fully discharged, the charger shall recharge them completely within four (4) hours. Charger output shall be supervised as part of the system power supply supervision.
 - e. Integral automatic transfer switch shall transfer the load to the battery without loss of signals or status indications when normal power fails.
- J. Addressable interface device:
- a. Description: Microelectronic monitor module listed for use in providing a multiplex system address for listed fire and sprinkler alarm-initiating devices with normally open contacts.
 - b. Integral Relay: Capable of providing a direct signal to the elevator controller to initiate elevator recall or to a circuit-breaker shunt trip for power shutdown.
- K. Digital alarm communicator transmitter:
- a. The digital alarm communicator transmitter shall be listed and labeled under U.L. 864 and NFPA 72.
 - b. Functional performance: When the unit receives an alarm, supervisory, or trouble signal from the FACP panel, it shall automatically capture one or two telephone lines and dial a preset number for a remote central station. When contact is made with the central station(s), the signal is transmitted. The unit shall supervise up to two (2) telephone lines. Where supervising two (2) lines, if service on either line is interrupted for longer than forty five (45) seconds, the unit shall initiate a local trouble signal and transmit a signal indicating loss of a telephone line to the remote alarm receiving station over the remaining line. When telephone service is restored, the unit shall automatically report

that event to the central station. If service is lost on both telephone lines, the local trouble signal is initiated.

- c. An integral rechargeable battery and automatic charger shall be provided.
- d. A self test shall be conducted automatically every twenty four (24) hours with a report transmitted to the central station.
- L. System printer shall be listed and labeled as an integral part of the fire alarm system.
- M. Welded wire mesh guards shall be provided for manual stations, smoke detectors, gongs, or other devices requiring protection. Wire mesh protectors shall be factory fabricated and furnished by the manufacturer of the device, painted to match the protected device.
- N. Wire:
 - a. Conductors for non-power-limited circuits shall be solid-copper, 600-V rated, 75 deg C.
 - i. Low-voltage circuits shall be No. 16 AWG, minimum.
 - ii. Line-voltage circuits shall be No. 12 AWG, minimum.
 - b. Conductors for power-limited circuits shall be NFPA 70, types FPL, FPLR, or FPLP, as recommended by manufacturer.
 - c. Conductors shall be color coded as follows:
 - i. Power branch circuit: Black, red and white.
 - ii. Initiating device: Black and red.
 - iii. Signal device: Blue (positive) and white (negative).
- O. Termination boxes shall consist of a junction box with a hinged cover and screw-type terminal block.

2.4 SYSTEM DESIGN AND INSTALLATION CRITERIA

- A. Type of System:
 - a. Manual Fire Alarm System; shall be provided as required by code. Typically, a manual fire alarm system will be provide in Medical Office Buildings greater than 50,000 gsf, or when the second floor is greater than 10,000 gsf. Fire alarm components may include, but are not limited to, the following:
 - b. Manual and Automatic Fire Alarm System: shall be 24VDC closed circuit, electrically supervised, zoned, non-coded, UL listed fire alarm system shall be provided when required by code. Typically, an automatic fire alarm system will be provided in buildings four or more stores in height, in "I" occupancies.
 - c. System shall include emergency voice / alarm communications and two way fire department communication system.

B. System Performance Criteria:

- a. Activation of any manual or automatic initiating device shall cause:
 - i. Normal LED on control panel and remote enunciator to extinguish and alarm LED to light. Control panel and remote enunciator buzzers shall sound and LCD on the control panel shall indicate the type of alarm and zone of alarm.
 - ii. All alarm horns to sound and strobe lights to flash continuously until system silence switch is operated. All strobes shall be synchronized.
 - iii. Electro-magnetic door holders to release.
 - iv. Remote location to be notified in a manner satisfying authorities having jurisdiction.
- b. Elevator smoke detectors shall recall elevator(s) and serve as an initiating device.
- c. HVAC duct smoke detectors shall shut down respective unit fan and serve as an initiating device.
- d. Duct smoke detectors, for damper control, shall, via relay contact close the respective damper. At each smoke damper designated on the Drawings, provide a relay module. This module shall control 24 VAC to the damper motor. Coordinate the installation with the Temperature Control and HVAC Contractor.
- e. Silencing of trouble alarm shall not prevent subsequent trouble or alarm being sounded.
- f. Trouble alarm shall be non-canceling except by clearing trouble condition.

C. System Description:

- a. System shall be controlled by the fire alarm control panel (FACP).
- b. Supervision: Automatically detect and report open circuits, shorts and grounds of wiring for initiating device, signaling line, and notification-appliance circuits.
- c. Priority of signals: An alarm signal is the highest priority. Automatic alarm response functions resulting from an alarm signal from one zone or device shall not be altered by subsequent alarm, supervisory, or trouble signals. Supervisory and trouble signals have second- and third-level priority. Higher-priority signals take precedence over signals of lower priority, even when the lower-priority condition occurs first. Alarm, supervisory, and trouble signals shall be displayed and annunciated regardless of the priority of the order received.
- d. Non-interference: A signal from one zone shall not prevent the receipt of signals from other zones.
- e. System reset: All zones shall be capable of being manually reset from the FACP after initiating devices are restored to normal.

- f. Off-Site Monitoring: Automatically route alarm, supervisory, and trouble signals to a remote alarm receiving station by means of a digital alarm communicator transmitter and telephone lines. The remote location shall be notified in a manner satisfying authorities having jurisdiction.
- D. Alarm capability during circuit fault conditions: System wiring and circuit arrangement shall prevent alarm capability reduction when:
- a. A single ground occurs in an initiating device circuit, signal line circuit, or notification-appliance circuit.
 - b. A single ground or open circuit occurs in an initiating device circuit, signal line circuit, or notification-appliance circuit.
 - c. An open circuit, ground or wire-to-wire short occurs, or an open circuit and a ground occur at the same time in an initiating device circuit, signal line circuit, or notification-appliance circuit.
- E. Loss of primary power at the FACP shall initiate a trouble signal and illuminate an emergency power light at the FACP and at the annunciator.
- F. Basic alarm performance requirements: The alarm operation of any of the following shall initiate the basic alarm sequence:
- a. Manual stations
 - b. Automatic heat detectors
 - c. Sprinkler flow devices
 - d. Smoke detectors and duct smoke detectors.
- G. The basic alarm sequence shall consist of the following:
- a. Notification-appliance operation.
 - b. Identification at the FACP and the remote annunciator of the device originating the alarm.
 - c. Transmission of an alarm signal to the remote alarm receiving station.
 - d. Operation of smoke control door openers.
 - e. Recall of elevators.
 - f. Shutdown of fans and other air handling equipment.
 - g. Close dampers in the HVAC system.

- h. Recording of the event in the system memory.
 - i. Recording of the event by the system printer.
- H. Alarm silencing, system reset and indication: Switches in the FACP and the remote annunciator:
 - a. The silencing switch operation shall halt alarm operation of notification appliances and activates an "alarm silence" light at the FACP and remote annunciator. Displays of the identity of the alarmed device(s) are retained at each location they are displayed.
 - b. Subsequent alarm signals from other devices shall reactivate the notification appliances until the silencing switch is operated again.
 - c. When the alarm-initiating devices return to normal and the system reset switch is operated, notification appliances shall operate again until the alarm silence switch is reset.
- I. Operation of a heat detector or a water flow device for the elevator shaft shall immediately shut down elevator power by operating a shunt trip in a circuit breaker feeding the associated elevator(s). A field-mounted relay actuated by either the heat detector, water flow switch or the FACP shall close the shunt trip circuit.
- J. Water-flow alarm switch operation shall initiate the flashing of the device location indicating light for the device that has operated.
- K. Sprinkler valve tamper switch operation shall initiate the following:
 - a. A supervisory, audible, and visible "valve-tamper" signal indication at the FACP and the annunciator.
 - b. Flashing of the device location indicating light for the device that has operated.
 - c. Recording of the event by the system printer.
 - d. Transmission of the supervisory signal to the remote alarm receiving station.
- L. Remote detector sensitivity adjustment: Manipulation of controls at the FACP shall cause the selection of specific addressable smoke detectors for adjustment, display of their current status and sensitivity settings, and allow control of changes in those settings. The same controls shall be used to program repetitive, scheduled, automated changes in sensitivity of specific detectors. Sensitivity adjustments and sensitivity-adjustment schedule changes shall be recorded in system memory and printed by the system printer.
- M. Removal of an alarm-initiating device or a notification appliance shall initiate the following:
 - a. A "trouble" signal indication at the FACP and the remote annunciator for the device involved.

- b. Recording of the event by the system printer.
 - c. Transmission of the trouble signal to the remote alarm receiving station.
- N. Printer: On the receipt of a signal, the printer shall:
- a. Print alarm, supervisory and trouble events with the following information:
 - i. Device
 - ii. Function
 - iii. Type of signal (alarm, supervisory, or trouble)
 - iv. Time and date of occurrence
 - b. Differentiate the alarm signals from all other printed indications.
 - c. Print system reset events, including the same information for device, location, date, and time.
 - d. Printout of existing conditions and historical log: A separate command shall initiate the printout of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.
- O. FACP alphanumeric display shall provide:
- a. English language descriptions of alarm, supervisory, and trouble events.
 - b. Addresses and locations of alarm-initiating or supervisory devices originating the report.
 - c. Displays of monitoring actions, system and component status, system commands, programming information, and data from the system's historical memory.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Signal circuits shall be rated two (2) amp and be capable of operating a maximum of nine (9) strobe lights and one (1) horn. Length shall be a maximum of 400'.
- C. Termination boxes shall be provided above public corridor or other accessible ceilings on each floor for connection of signal devices.
- D. The number of signal devices shall be maximized on each circuit and may overlap different suites.
- E. End of line (EOL) resistors shall be sized for the number of devices on a circuit and be installed at the last device on each signal circuit. If devices are added to a signal circuit, a new EOL shall be provided.

- F. Devices shall be mounted as follows (measured from floor to centerline of device):
- a. Manual pull stations: 48"
 - b. Strobe and speaker / strobe units: 80"
 - c. Speakers: 80"
 - d. Magnetic door holders: 80"
- G. Components (not all components listed may be required for this project):
- a. The FACP shall be connected with a disconnect switch with lockable handle or cover.
 - b. Manual pull stations: Mount semi-flush in recessed back boxes.
 - c. Water-flow detectors and valve supervisory switches (provided by others): Connect for each sprinkler valve station required to be supervised.
 - d. Ceiling-mounted smoke detectors: Mount not less than four (4) inches from a side wall to the near edge.
 - e. Smoke detectors near air registers: Install no closer than sixty (60) inches from their register.
 - f. Duct smoke detectors sampling tubes shall be installed so they extend the full width of the duct. Coordinate the installation with the HVAC Contractor.
 - g. Heat detectors in elevator shafts and elevator equipment rooms: Coordinate temperature rating and location with sprinkler rating and location.
 - h. Audible alarm-indicating devices shall be installed on flush-mounted back boxes.
 - i. Visible alarm-indicating devices shall be installed adjacent to or in combination with each alarm horn.
 - j. Device location-indicating lights shall be located in a public space near the device they monitor.
 - k. FACP shall be surface mounted with the top of the cabinet not more than seventy-two (72) inches above the finished floor.
 - l. Annunciator shall be installed with the top of the panel not more than seventy-two (72) inches above the finished floor.
 - m. Main Fire Alarm Panel, Emergency Voice / Alarm Communications and two-way Fire Department Communications System panels shall be located in the Fire Command Center.

H. Wiring:

- a. Wiring shall be installed in a metallic raceway if required by governing codes and authorities having jurisdiction.
- b. Wiring within enclosures: Separate power-limited and non-power-limited conductors as recommended by the manufacturer. Install conductors parallel with or at right angles to the sides and back of the enclosure. Bundle, lace and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
- c. Cable taps: Use numbered terminal strips in junction, pull and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.
- d. Wiring to the remote alarm transmitting device shall be installed in 1 inch conduit between the FACP and the transmitter. Provide the number of conductors and electrical supervision for connecting wiring as required to suit the monitoring function.

I. Identification:

- a. System components, wiring, cabling, and terminals shall be identified.
- b. Framed instructions shall be installed in a location visible from the FACP.
- c. The Power-supply disconnect switch shall be painted red and labeled "FIRE ALARM."
- d. The FACP shall be complete with a typed directory mounted on the inside of the panel door to identify all circuits as to area served.

J. Grounding:

- a. Cable shields and equipment shall be grounded in accordance with the system manufacturer's written instructions to eliminate shock hazard and to minimize, to the greatest extent possible, ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
- b. The signal ground terminal shall be located at the main equipment rack or cabinet, isolated from the power system and equipment grounding.
- c. Equipment and conductor and cable shields shall be grounded. For audio circuits, ground loops, common-mode returns, noise pickup, cross talk, and other impairments shall be minimized to the greatest extent possible. Provide 5-ohm ground at main equipment location. Measure, record, and report ground resistance.

- K. Smoke Damper Control; electrical contractor shall wire from 120 volt Life Safety Panel through relay module to respective smoke damper. Coordinate this wiring with HVAC and Temperature Control Contractors.

3.2 FIELD QUALITY CONTROL

- A. A factory-authorized service representative shall be engaged to inspect field-assembled components and connections and to supervise pre-testing, testing, and adjustment of the system. Report results in writing to Landmark.

3.3 TESTS BY CONTRACTOR

- A. The complete fire alarm system shall be tested for proper operation as required by governing codes, agencies, and authorities having jurisdiction.
- B. Provide a minimum of ten (10) days written notice shall be provided to Landmark when the system is ready for final acceptance testing.
- C. Perform the following tests in the presence of the Landmark
- D. The system shall be tested in accordance NFPA 72 with minimum required tests as follows:
 - a. Verify the absence of unwanted voltages between circuit conductors and ground.
 - b. Test all conductors for short circuits using an insulation-testing device.
 - c. With each circuit pair, short circuit at the far end of the circuit and measure the circuit resistance with an ohmmeter. Record the circuit resistance of each circuit on record drawings.
 - d. Verify that the control unit is in the normal condition as detailed in the manufacturer's operation and maintenance manual.
 - e. Test initiating and indicating circuits for proper signal transmission under open circuit conditions. One connection each should be opened at not less than 10 percent of initiating and indicating devices. Observe proper signal transmission according to class of wiring used.
 - f. Test each initiating and indicating device for alarm operation and proper response at the control unit. Test smoke detectors with actual products of combustion.
 - g. Test the system for all specified functions. Test both primary and secondary power: Verify by test that the secondary power system is capable of operating the system for the period and in the manner specified.

3.2 TESTS BY REGULATORY AGENCIES

- A. Testing by regulatory agencies will be performed at their discretion; and shall be documented by the Contractor.
- B. Obtain required permits to perform tests. Perform tests required by regulatory agencies.
- C. Schedule tests with agencies and if possible, with Landmark present.
- D. Furnish test and approval certificates issued by jurisdictional authorities.

END 16530.

DIVISION 16 - ELECTRICAL
Section 16550- Lighting Control Equipment

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. A lighting control system for the control of exterior lighting.
- B. Automatic interior lighting control system.

1.2 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Keys: Deliver keyed toggle switches (five for each switch) for panels and other equipment.
 - a. Keys shall be tagged indicating panel, location, and panel use.
 - b. Deliver keys to Landmark by security shipment direct from manufacturer.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 LIGHTING CONTROL

- A. Exterior lighting; time clock off-day, photocell on-night, 1500 watt tungsten rated SPST contact, 2 to 5 foot-candle adjustable light sensing range, time delayed switching, weatherproof. One of the following approved manufacturers and products may be used:
 - a. Tork, “#2100 Series”
 - b. Paragon Electric, “approved equal product”
 - c. General Electric, “approved equal product”
 - d. Additional approved equal manufacturers and products shall be considered
- B. Interior lighting; programmable microprocessor based lighting control panel shall include programmability to control all lighting control relays independent of one another. Each lighting control relay shall control line side power to all local area switches. Lighting control panel shall be included with a momentary contact, series connect, master switch(es) located throughout the facility which, upon initiation will extend “lighting circuits on” feature in adjustable increments of time. An alarm flash of the lighting circuits shall be provided to warn occupants of impending “lighting circuits off” feature.

2.2 LIGHTING CONTROL PANEL

- A. Lighting control panel; shall be 16 gauge steel construction, (18 gauge for 8 relay unit) completely painted with enamel paint. Maximum of 14” wide; height shall vary depending on the relay capacity of the enclosure. A barrier shall be provided to separate the low voltage compartment from the high voltage compartment. A cover secured by screws shall be provided to enclose the high voltage compartment marked to warn of the danger of high voltage.
 - a. The unit shall be wired to accept the maximum number of relays (8, 16, 32, 48 or 60 relays) without requiring the addition of any automation cards, relay output modules or additional electronics.
 - b. Any number of relays, up to the maximum size, may be installed in any one of the sizes listed. Door shall be hinged with key lock painted to match the enclosure. Input control power shall be 120 VAC, 60 Hz with internal fusing.
 - c. One of the following approved manufacturers and products may be used:
 - i. Triatek, “LP Series”
 - ii. Lithonia “SUE Series”
 - iii. Additional approved equal manufacturers and products shall be considered
- B. Lighting Control Relay: Each controlled circuit shall be connected through a single pole, single throw momentary-pulsed mechanically latching contactor rated at 20 amps, 120-277 VAC including:
 - a. Mechanically latching relay using a dual coil technology.
 - b. Relays shall attach to the barrier and plug into the Relay Interface Board via quick connect plug in connectors. Relays that use screw terminations for low voltage connections are not acceptable.
 - c. Load contacts rated as follows: 20A, 125 VAC Tungsten; 20A @ 277 VAC) Ballast or Resistive; 0.5 HP @ 125 VAC; 1.5 HP @ 277 VAC.
 - d. Factory wiring for low voltage control without requiring rewiring in the field regardless of panel zoning requirements.
 - e. One of the following approved manufacturers and products may be used:
 - i. Triatek, “LP-3500 Series” with 32 relay enclosure or
 - ii. Lithonia, “approved equal product”
 - iii. Additional approved equal manufacturers and products shall be considered

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Install control equipment with required wiring devices to achieve lighting shut off or other control shown on Drawings.
- C. Exterior lighting shall be controlled by either an astronomical time clock or photo sensor to shut off exterior lights.
- D. All interior lighting shall be routed through a relay panel unless noted otherwise.

END 16550

DIVISION 16 - ELECTRICAL
Section 16720- Telephone Systems

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Telephone, cable television and internet service coordination, shell and core telephone lines, telephone and computer data empty conduit stubs to above ceilings, and empty outlet boxes.
 - a Telephone wiring to the tenant suites is not included in the Contract.
 - b This Contract assumes that the tenant suite telephone system installer will use CAT 5 or 6 plenum rated shielded cables and that wiring will be installed above ceilings using cable rings. A conduit system will not be required, except as herein specified.

1.2 QUALITY ASSURANCE

- A. Requirements of the Telephone Company, Cable Television Company and Internet Provider shall be followed.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Telephone, cable television and computer data system conduit and outlet boxes; shall include one standard single gang outlet box and 3/4" conduit stubbed to above accessible ceiling space. Locations shall be as indicated on the Drawings.
- B. Blank Cover Plates; shall be provided for all boxes which are not covered by device plates provided in tenant's telephone system. Cover plates shall be smooth ivory color. One of the following equal manufacturers and products may be used:
 - a. Hubbell
 - b. Leviton
 - c. Pass & Seymour
 - d. Additional approved equal products shall be considered.

2.2 SYSTEM DESIGN AND INSTALLATION CRITERIA

- A. Telephone distribution conduit and outlet boxes shall be provided as follows:
 - a. One outlet box and conduit in the wall of the lobby for a public pay phone.
 - b. One outlet box and conduit in each Business/ Reception office, Consultation/Private office, Laboratory/Nurses Station.
- B. Unless otherwise shown on Drawings, all telephone outlets shall be mounted as follows (measured from floor to centerline of outlet):
 - a. Outlets at knee spaces or typewriter drops shall be at 18".
 - b. Outlets mounted above countertops shall be mounted horizontally.
 - c. Outlets mounted above countertops without a backsplash shall be mounted 3" from countertop to center of outlet.
 - d. Outlets mounted above countertops with a backsplash shall be mounted 2" from top of backsplash to center of outlet.
 - e. Wall phone outlets shall be at 54", unless noted otherwise on the Drawings.

2.3 SHELL AND CORE TELEPHONE WIRING

- A. Telephone wiring to the tenant suites is not included in the Contract, unless noted otherwise.
- B. The telephone utility company shall run telephone wiring to the main building telephone backboard. The Contractor shall provide conduit as indicated on the Drawings. The Contractor shall provide telephone wiring as noted below.
- C. Contractor shall provide an alternate price to provide telephone wiring between the main building telephone backboard to the telephone rooms one each floor, as follows:
 - a. Run 50 pair of plenum rated shielded cables to each telephone equipment room where the floor plan is less than or equal to 20,000 square feet.
 - b. Run 75 pair of plenum rated shielded cables to each telephone equipment room where the floor plan is greater than 20,000 square feet.
- D. A pair of plenum rated shielded cables shall be provided between the main building telephone backboard and elevator controllers for the emergency phone.
- E. A pair of plenum rated shielded cables shall be provided between the main building telephone backboard and the fire alarm system for auto dialer monitoring equipment. If the building has a Fire Command Center, provide telephone wiring to outlet in room.
- F. CAT 5 plenum rated shielded cables shall be provided between the main building telephone backboard and the Direct Digital Control system computer.
- G. CAT 5 plenum rated shielded cables shall be provided between the main building telephone backboard and the public telephone located in the lobby.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. Telephone conduit, except for entry service, shall be installed so as to permit ceiling access.

END 16720.

DIVISION 16 - ELECTRICAL
Section 16730- Rescue Assistance Communications System

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. A two-way communication system with visual indication at areas of rescue assistance.

1.2 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on the rescue assistance communication system:

1.3 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Operation and Maintenance Data:
 - a. Include a parts catalog with complete list of equipment replacement parts and identify each entry with equipment description and identifying code.
 - b. Provide technical information for servicing operating equipment.
 - c. Include legible schematic wiring diagrams of installed electrical equipment and changes made in the Work
- B. Warranty: Submit manufacturer and installer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for manufacture, product, and installation of system.
- B. Work shall conform with Applicable local and state codes, The National Electric Code, NFPA 72A, and the Americans with Disabilities Act (ADA) 1990-28 CFR Part 36
- C. The complete system shall satisfy requirements of the Americans with Disabilities Act (ADA) 1990-28 CFR, Part 36 for two-way communication at areas of rescue assistance.

1.5 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Warranty: Include manufacturer's standard warranty coverage for operating equipment and devices.

PART 2 PRODUCTS

2.1 MANUFACTURE

- A. Master Station: Cornell Communications A-4102.
 - a. Capacity based on quantity of remote stations.
 - b. 24 volt DC operation.
 - c. Flush mounted decorative enclosure.
- B. Remote Stations: Cornell Communications 4101.
 - a. Single station remote.
 - b. 24 volt DC operation.
 - c. Flush mounted stainless steel enclosure.
- C. Power Supply: Cornell communications C5243 with battery back-up.

2.2 SYSTEM DESIGN AND INSTALLATION CRITERIA

- A. Upon activation of the momentary LED switch on a remote station (4101) the tone shall sound only at that location.
- B. The LED for that zone on the switch at the master station shall illuminate and sound an intermittent tone.
- C. The call is acknowledged by pushing the associated switch on the master.
- D. The LED on the master and at the remote station will then flash.
- E. The intermittent tone at the master will stop and an intermittent tone shall sound at the remote station. The call is canceled by pushing the associated switch at the master for a second time while it is in the flashing mode.
- F. The LED's at the master and at the remote stations shall be extinguished and all tones shall cease.
- G. In the event of a wire fault the yellow LED at the master station shall illuminate and an intermittent tone shall sound.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer recommendations.
- B. All wiring shall be plenum rated unless local code requires installation in conduit.

- C. In-line splices shall not be used.
- D. All wire shall be tagged and indexed with Brady-type tags.
- E. Sta-con terminals shall be provided for termination to all screw terminals.
- F. Wiring:
 - a. Four conductor 24 gauge from each remote station to the master station up to 3000 ft. Wiring shall be #20 AWG or otherwise as recommended by the manufacturer.
 - b. Two conductor 18 gauge from power supply to the master station.
 - c. All wiring shall be tested for grounds and short circuits prior to termination.
- G. Master and remote stations shall be flush mounted with back boxes as required.
- H. Devices shall be mounted as follows (measured from floor to centerline of device):
 - a. Master station: 48"
 - b. Remote stations: 48"

END 16730.

DIVISION 16 - ELECTRICAL
Section 16750- Nurse Call System Rough-In

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nurse call system shall consist of empty conduit stubs from nurse call lights to above finished ceilings, and associated empty outlet boxes.
 - a Nurse call system and wiring is not included in the Contract, unless noted otherwise.
 - b This Contract assumes that the installer will use teflon coated plenum approved wiring and that a conduit system will not be required beyond as herein specified.

1.2 REGULATORY REQUIREMENTS

- A. Conform to applicable building code and electrical code for correct healthcare grade facilities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Nurse call system conduit and outlet boxes; shall include one standard single gang outlet box and 1/2" conduit stubbed to above accessible ceiling space.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Nurse call system conduit shall be installed so as to permit ceiling access.

END 16750.

DIVISION 16 - ELECTRICAL
Section 16751- Nurse Call System

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nurse call master station.
- B. Central control and power supply equipment.
- C. Call stations.
- D. Accessories.

1.2 RELATED SECTIONS

- A. Division 16 – Building wiring and cables.

1.3 REFERENCES

- A. NFPA 70 National Electrical Code (NEC).

1.4 SYSTEM DESCRIPTION

- A. General: The work consists of furnishing and installing the audiovisual Nurse Call System as indicated on drawings. All items required for each system to be complete and operable shall be furnished.
- B. System Description – The system shall consist of visual master station, emergency call stations, corridor dome lights, control modules, power supplies, hardware and accessory items. All as required for a complete and operable system. The equipment shall consist of a nationally recognized, over-the-counter product, which may be easily serviced by non-factory associated personnel. The system shall provide visual and audible signal communications between nursing personnel and patients.
- C. The installation shall be under the direct supervision of the manufacturer's authorized representative. The manufacturer shall have had similar systems in operation for a minimum of two (2) years.
- D. System Capacity:
 - a. Master Stations: As shown on drawings.
 - b. Call Stations: As shown on drawings.
 - c. Conversation Paths: One (1) for each communicator.
 - d. Call stations on each master may call simultaneously, without interference.

E. System Configuration:

- a. Nurse Stations: Master station at each indicated nurse station receives calls from designated locations.
- b. Patient Preparation, Recovery and Step-Down areas: Single or dual patient station at each patient bed, set for medical status of patient.
- c. Patient Lavatories, Baths and Showers: Emergency station at each location.
- d. Other Rooms as Shown: Staff station and duty stations to provide normal status calls.

F. Calling Sequence of Operation:

- a. Patient Station Calls: Initiate call manually using call cord switch, or automatically if call cord is removed from station. Medical status of call pre-set at master station.
- b. Staff Station Calls: Initiate call manually with call switch. Medical status of call pre-set at master station.
- c. Emergency Station Calls: Initiate emergency status call manually with call switch.
- d. Master Station Calls: Establish two-way voice communication to selected patient, or staff, call stations or between other master stations.

G. Annunciation Sequence of Operation:

- a. Call Annunciation at Master Station: Indicate each call and its medical status from patient, staff and emergency call stations visually and audibly with tone.
- b. Call Annunciation at Patient Station: Signal light indication of room activity monitoring from master station.
- c. Patient Signal Lights: Indicate each patient station call and its status. Indicate reminder status by lighting corridor signal light outside selected room.

H. Call Station Annunciation:

- a. Normal Status Calls: Use steady white lamps and slow rate repeating tones until answered; cancel call automatically when answered from master station, or manually from calling station.
- b. Priority Status Calls: Use flashing lamps and fast rate repeating tones until answered; cancel call manually from calling station.
- c. Emergency Status Calls: Use flashing red lamps, and fast rate repetitive tone until answered; cancel call manually from calling station.
- d. Call Reminder: Use flashing amber lamps; cancel reminder manually from selected patient station.

I. Intercom Sequence of Operation:

- a. Each master selects any other master, any patient, staff, or duty call station for two-way communication.
- b. Each patient station, duty station, and staff station may initiate PRIVACY, disabling the master station's ability to monitor its activity.
- c. Staff assist status call automatically establishes two-way communication between calling station and staff assist master stations.

1.5 SUBMITTALS

- A. Submit under provisions of Division 1 requirements.
- B. Shop Drawings: Indicate electrical characteristics and connection requirements; cable routing; connection diagrams; and equipment arrangement.
- C. Product Data: Provide showing electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division 1 requirements.
- B. Record actual locations of each item of equipment and show interconnecting wiring.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Division 1 requirements.
- B. Operation Data: Operator instructions for each required mode of operation.
- C. Maintenance Data: Routine troubleshooting procedures, manufacturer's operation and maintenance manual for each item of equipment and accessory, and routine cleaning methods and materials.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three (3) years experience, and with service facilities within 100 miles of project.
- B. Supplier: Authorized distributor of specified manufacturer with minimum three (3) years experience.

- C. Installer: Authorized installer of specified manufacturer with service facilities within 100 miles of project.

1.9 REGULATORY REQUIREMENTS

- A. Conform to requirements of applicable codes for nurse call systems.
- B. Conform to requirements of NFPA 70 and NFPA 99.
- C. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

1.10 MAINTENANCE SERVICE

- A. Furnish service and maintenance of nurse call system for one (1) year from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Lee Dan Communications, Inc.
- B. Other manufacturers providing equivalent equipment. The equipment shall be equal in every way to that manufactured by Lee Dan Communications, Inc. Catalogue and model numbers are intended to indicate type and quality of design and material, as well as operating features required. The equipment furnished under this specification shall be currently installed in at least six (6) hospitals with references listing those installations and person(s) to contact. This shall be submittal concurrently with the bid proposal.

2.2 MASTER STATION

- A. Description: Recessed wall mounted master nurse call unit, Model NC150N, as manufactured by Lee Dan Communications, Inc.
- B. Speaker Sensitivity: 92 dB/watt input.
- C. Handset: Standard molded plastic telephone handset with four (4) feet long permanently coiled cord.
- D. Controls and Indicators: Mark each control and indicator with legible and permanent nameplates. Provide the following minimum controls and indicators:
 - a. Manual selector switch for each call station, other master stations, and page circuit. Include zone selector switch for each zone.
 - b. Lighted annunciator integral with each selector switch for each call station. Use lamps replaceable from front of unit.

2.3 CALL STATIONS

- A. Patient Call Station: Recessed wall mounted call station.
 - a. Integral speaker/microphone.
 - b. Pillow speaker receptacle. Provide two (2) receptacles for two (2) bed patient stations.
 - c. CANCEL switch.
 - d. CALL ASSURANCE light indicating station call.
 - e. PRIVACY switch to disable microphone function of speaker.
 - f. System Monitor: Key operated switch to enable patient station to function as system monitor.
 - g. Staff Assist Switch: Integral pushbutton switch with engraved legend PUSH FOR HELP.
- B. Emergency Station: Recessed wall mounted call station, suitable for use in wet location, and with the following features.
 - a. Pull Cord Actuated Station: Enclosed switch with six (6) foot nylon cord, held by breakaway chain. End of actuated cord shall be a maximum of 3" AFF.
 - b. Push Actuated Station: Red pushbutton pad with engraved legend PUSH FOR HELP.
 - c. CANCEL switch.
 - d. CALL ASSURANCE light to indicate station call.
- C. Staff Station: Recessed wall mounted call station with the following features:
 - a. Integral speaker/microphone.
 - b. CALL switch.
 - c. CANCEL switch.

2.4 ACCESSORIES

- A. Corridor Light: Wall or ceiling mounted indicating light units with the following features:
 - a. Four (4) Lamp Units: Red, green, amber and white lamps.
 - b. Enclosure: Heat resistant diffuser with barriers to separate lamps.
 - c. Reminder status control.
- B. Call Cord: Pushbutton switch in plastic housing, molded to six (6) foot cord with plug to fit patient station receptacle. Provide non-removable stainless steel sheet clamp.
- C. Nurse Call System Cable.

- a. Manufacturers: Belden plenum rated cables, or approved equal.
- b. Home Run Cable: Twisted, shielded pair, 20 AWG.
- c. Other cabling as per manufacturer's requirements.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install patient call stations at 60 inches above finished floor.
- C. Install lavatory emergency stations at 48 inches above finished floor.
- D. Install all other stations at 60 inches above finished floor, unless otherwise noted.

3.2 FIELD QUALITY CONTROL

- A. Perform operational test on each item of equipment and on system.

3.3 MANUFACTURER'S FIELD SERVICES

- A. Observe installation of nurse call equipment.
- B. Provide field technician services to make final signal cable connections to equipment.
- C. Prepare and start systems.
- D. Provide systems demonstration.

3.4 ADJUSTING

- A. Adjust controls to achieve proper operation.
- B. Set medical status of each patient and staff station as directed.

3.5 DEMONSTRATION

- A. Allow minimum of four (4) hours for demonstration of system.
- B. Demonstrate system operation to designated Owner personnel.
- C. Conduct walking tour of project and briefly describe function, operation, and maintenance of each component.
- D. Use submitted operation and maintenance manual as reference during demonstration and training.

END 16751