



























**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**SECTION 0001  
TABLE OF CONTENTS**

**SPECIFICATIONS**

**1.01 DIVISION 01 - GENERAL REQUIREMENTS**

- A. 012500 - Substitution Procedures
- B. 013000 - Administrative Requirements
- C. 014000 - Quality Requirements
- D. 016000 - Product Requirements
- E. 017000 - Execution and Closeout Requirements
- F. 017419 - Construction Waste Management and Disposal

**1.02 DIVISION 02 - EXISTING CONDITIONS**

- A. 024100 - Demolition

**1.03 DIVISION 03 - CONCRETE (NOT USED)**

**1.04 DIVISION 04 - MASONRY (NOT USED)**

**1.05 DIVISION 05 - METALS (NOT USED)**

- A. 054000 - Cold-Formed Metal Framing

**1.06 DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES**

- A. 061053 - Miscellaneous Rough Carpentry
- B. 062000 - Finish Carpentry
- C. 065316 - Fiberglass Reinforced Paneling

**1.07 DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

- A. 078400 - Firestopping
- B. 078200 - Joint Sealants

**1.08 DIVISION 08 - OPENINGS**

- A. 081416 - Flush Wood Doors
- B. 083100 - Access Doors and Panels

**1.09 DIVISION 09 - FINISHES**

- A. 090561 - Common Work Results for Flooring Preparation
- B. 092116 - Gypsum Board Assemblies
- C. 092216 - Non-Structural Metal Framing
- D. 093000 - Tiling
- E. 096816 - Sheet Carpeting
- F. 099000 - Painting and Coating

**1.10 DIVISION 10 - SPECIALTIES**

- A. 101423 - Panel Signage
- B. 102800 - Wall and Door Protection

**1.11 DIVISION 11 - EQUIPMENT (NOT USED)**

**1.12 DIVISION 12 - FURNISHINGS**

- A. 129313 - Bicycle Racks

**1.13 DIVISION 13 - SPECIAL CONSTRUCTION (NOT USED)**

**1.14 DIVISION 14 - CONVEYER EQUIPMENT (NOT USED)**

**1.15 DIVISION 21 - FIRE SUPPRESSION (NOT USED)**

**1.16 DIVISION 22 - PLUMBING (NOT USED)**

**1.17 DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC) (NOT USED)**

**1.18 DIVISION 26 - INTEGRATED AUTOMATION (NOT USED)**

**1.19 DIVISION 28 - ELECTRICAL (NOT USED)**

**1.20 DIVISION 27 - COMMUNICATIONS (NOT USED)**

**1.21 DIVISION 28 - ELECTRONIC SAFETY AND SECURITY (NOT USED)**

**DIVISION 01 - GENERAL REQUIREMENTS  
SECTION 012500  
SUBSTITUTION PROCEDURES**

- PART 1 GENERAL**
- 1.01 SECTION INCLUDES**
- A. Procedural requirements for proposed substitutions.
- 1.02 RELATED REQUIREMENTS**
- A. Section 016000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.
- 1.03 DEFINITIONS**
- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
    - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      - a. Unavailability.
      - b. Changes in Project conditions.
      - c. Regulatory changes.
      - d. Unavailability under warranty terms.
    - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      - a. Substitution requests offering advantages solely to the Contractor will not be considered.
- 1.04 REFERENCE**
- A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage), Current Edition.
  - B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase), Current Edition.
- PART 2 PRODUCTS - NOT USED**
- PART 3 EXECUTION**
- 3.01 GENERAL REQUIREMENTS**
- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
    - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
    - 2. Agrees to provide the same warranty for the substitution as for the specified product.
    - 3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
    - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
  - B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
  - C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
    - 1. Contractor's Substitution Request document must include the following:
      - a. Project Information:
        - 1) Official project name and number, and any additional required identifiers established in Contract Documents.
        - 2. Substitution Request Information:
          - a. Discrete and consecutive Substitution Request number, and descriptive subject/title.
          - b. Description of whether the substitution is for cause or convenience.
          - 3. Issue date.
          - 4. Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
        - 5. Description of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
          - (a) Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
          - (b) Reason why the specified item cannot be provided.
          - (c) Differences between proposed substitution and specified item.
          - (d) Description of how proposed substitution affects other parts of work.
        - 6. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item - Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified:
          - 1) Physical characteristics.
          - 2) In-service performance.
          - 3) Expected durability.
          - 4) Warranties.
        - 7. Include, as appropriate or requested, the following types of documentation:
          - (a) Product Data: Including drawings and descriptions of products and fabrication and installation procedures.
          - (b) Samples, where applicable or required.
          - (c) Certificates, test, reports or similar qualification data.
          - (d) List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
          - (e) Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
          - (f) Research reports evidencing compliance with building code in effect for Project, from ICC-ES or related organization.
          - (g) Detailed comparison of Contractor's construction schedule using proposed substitutions with Contractor's construction schedule for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include a letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
          - (h) Cost information, including a proposal of change, if any, in the Contract Sum.
          - (i) Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
          - (j) Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
        - 8. Impact of Substitution:
          - 1) Savings to Owner for accepting substitution.
          - 2) Change in Contract Time due to accepting substitution.
      - D. Limit each request to a single proposed substitution item.
        - 1. Submit an electronic document, combining the request form with supporting data into single document.
- 3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT**
- A. Submittal Time Restrictions:
    - 1. Owner will consider requests for substitutions only if submitted at least 10 days prior to the date for receipt of bids.
  - B. Submittal Form (before award of contract):
    - 1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request. See this form for additional information and instructions. Use only this form, other forms of submission are unacceptable.
- 3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION**
- A. Submittal Form (after award of contract):
    - 1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions. Use only this form, other forms of submission are unacceptable.
    - 2. Architect will consider requests for substitutions only within 15 days after date of Agreement.

- C. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Substitution request is fully documented and properly submitted.
    - c. Requested substitution will not adversely affect Contractor's construction schedule.
    - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - e. Requested substitution is compatible with other portions of the Work.
    - f. Requested substitution has been coordinated with other portions of the Work.
    - g. Requested substitution provides specified warranty.
    - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
  - 2. When acceptance will require revisions to Contract Documents.
- D. Substitutions for Convenience: Not allowed.
- E. Substitutions will not be considered under one or more of the following circumstances:
  - 1. Without a separate written request.
  - 2. When acceptance will require revisions to Contract Documents.

**END OF SECTION 012500**

**SECTION 012600  
CONTRACT MODIFICATION PROCEDURES**

- PART 1 GENERAL**
- 1.01 SUMMARY**
- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
  - B. Related Requirements:
    - 1. Section 012500 - Substitution Procedures for administrative procedures for handling requests for substitutions made after the Contract award.
- 1.02 MINOR CHANGES IN THE WORK**
- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.
    - 1. Section 012500 - Substitution Procedures for administrative procedures for handling requests for substitutions made after the Contract award.
- 1.03 PROPOSAL REQUESTS**
- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
    - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
    - 2. Within time specified in Proposal Request or 7 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      - b. Include applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      - c. Include costs of labor and supervision directly attributable to the change.
      - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      - e. Quotation Form: Use forms acceptable to Owner.
  - B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Owner and/or Architect.
    - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
    - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - 4. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    - 5. Comply with requirements in Section 012500 - Substitution Procedures if the proposed change requires substitution of one product or system product or system specified.
    - 6. Proposal Request Form: Use form acceptable to Owner.

- 1.04 CHANGE ORDER PROCEDURES**
- A. On Owner's approval of a Work Changes Proposal Request, Owner and/or Architect will issue a Change Order for signatures of Owner and Contractor.
- 1.05 CONSTRUCTION CHANGE DIRECTIVE**
- A. Construction Change Directive: Owner and/or Architect may issue a Construction Change Directive on AIA Document G714 - Change Directive Instructions Contract to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
    - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

**END OF SECTION 012600**

**SECTION 013000  
ADMINISTRATIVE REQUIREMENTS**

- PART 1 GENERAL**
- 1.01 SECTION INCLUDES**
- A. Startup construction schedule.
  - B. Contractor's construction schedule.
  - C. Construction schedule updating reports.
  - D. Material location reports.
  - E. Site condition reports.
  - F. Special reports.
  - G. Preconstruction meeting.
  - H. Progress meetings.
  - I. Progress photographs.
  - J. Requests for Interpretation (RFI) procedures.
  - K. Submittal procedures.
- 1.02 RELATED REQUIREMENTS**
- A. Section 016000 - Product Requirements: General product requirements.
- 1.03 REFERENCE STANDARDS**
- A. AIA G716 - Request for Information, 2004.
  - B. CSI/CSC Form 12.1A - Submittal Transmittal, Current Edition.
- 1.04 DEFINITIONS**
- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities include in a construction schedule consume time and resources.
    - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
    - 2. Predecessor Activity: An activity that precedes another activity in the network.
    - 3. Successor Activity: An activity that follows another activity in the network.
  - B. BIM: Building Information Modeling.
  - C. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.
  - D. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
  - E. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
  - F. Event: The starting or ending point of an activity.
    - 1. Float: The measure of leeway in starting and completing an activity.
    - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
    - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
  - G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.
    - 1. RFI: Request for information. Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.
- 1.05 QUALITY ASSURANCE**
- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013000 - Administrative Requirements for information. Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.
    - 1. Review software limitations and content and format for reports.
    - 2. Verify availability of qualified personnel needed to develop and update schedule.
    - 3. Discuss constraints, including phasing work stages, area separations, interim milestones and partial Owner/Owner occupancy.
    - 4. Review delivery dates for Owner-furnished products.
    - 5. Review schedule for work of Owner's separate contracts.
    - 6. Review submittal requirements and procedures.
    - 7. Review time required for review of submittals and resubmittals.
    - 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
    - 9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
    - 10. Review and finalize list of construction activities to be included in schedule.
    - 11. Review procedures for updating schedule.

- 1.06 COORDINATION**
- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontractors, submittal schedule, progress reports, payment reports, and other required schedules and reports.
    - 1. Secure time commitments for performing critical elements of the Work from entities involved.
    - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

**PART 2 PRODUCTS**

**2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE - GENERAL**

- A. Time Frame: Establish schedule from date established for the Notice to Proceed to date of final completion.
  - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

- 1. Activity Duration: Define activities as no activity is longer than 20 days, unless specifically allowed by Architect.
  - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  - 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
  - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for the Owner's and Architect's administrative procedures necessary for certification of Substantial Completion.
  - 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- CONTRACTS:** Include constraints and work restrictions indicated in the Contract Documents and as follows in final schedule, and show how the sequence of the Work is affected:
- 1. Phasing: Arrange list of activities on schedule by phase.
  - 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  - 3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in the Contract. Delivery dates indicated stipulate the earliest possible delivery date.
  - 4. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in the Contract. Delivery dates indicated stipulate the earliest possible delivery date.
  - 5. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Limitations of continued occupancies.
    - b. Uninterruptible services.
    - c. Partial occupancy before Substantial Completion.
    - d. Use of premises restrictions.
    - e. Provisions for future construction.
    - f. Seasonal variations.
    - g. Environmental control.
  - 6. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    - a. Subcontract awards.
    - b. Submittals.
    - c. Purchases.
    - d. Mockups.
    - e. Fabrication.
    - f. Sample testing.
    - g. Deliveries.
    - h. Installation.
    - i. Tests and inspections.
    - j. Adjusting.
    - k. Curing.
    - l. Start and placement into final use and operation.
  - 7. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    - a. Structural completion.
    - b. Temporary enclosure and space conditioning.
    - c. Permanent space enclosure.
    - d. Completion of mechanical installation.
    - e. Completion of electrical installation.
    - f. Substantial Completion.
  - 8. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
    - 1. Temporary enclosure and space conditioning.
    - 2. Store equipment (shelving and refrigeration equipment; start and completion dates.
  - 9. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
    - 1. Unresolved issues.
    - 2. Unanswered Requests for Information.
    - 3. Rejected or unreturned submittals.
    - 4. Notations on returned submittals.
    - 5. Pending modifications affecting the Work and Contract Time.
  - 10. Recovery Schedule: When period update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

**2.02 STARTUP CONSTRUCTION SCHEDULE**

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

**2.03 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)**

- A. General: Prepare network diagrams using AON (actively-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's construction schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
  - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM scheduling information.
  - 3. Institute procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  - 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical activities.
  - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Mobilization and demobilization.
    - c. Purchase of materials.
    - d. Delivery.
    - e. Fabrication.
    - f. Utility interruptions.
    - g. Installation.
    - h. Work by Owner that may affect or be affected by Contractor's activities.
    - i. Testing and commissioning.
    - j. Punch list and final completion.
    - k. Activities occurring following final completion.
  - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with milestones dates.
  - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  - 4. Format: Mark the critical path. Locate the critical path near center of network, locate paths with most float near the edges.
    - a. Subnetworks or separate sheets are permissible for activities clearly off the critical path.
  - 5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontractors for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, Sustainable Design Requirements, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
    - a. Each activity cost shall reflect an appropriate value subject to approval by Architect.
    - b. Total cost assigned to activities shall equal the total Contract Sum.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network diagram to demonstrate the effect of the proposed change on the overall project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
  - 1. Contractor or subcontractor and the Work or activity.
  - 2. Description of activity.
  - 3. Main events of activity.
  - 4. Immediate preceding and succeeding activities.
  - 5. Early and late start dates.
  - 6. Early and late finish dates.
  - 7. Activity duration in workdays.
  - 8. Total float or slack time.
  - 9. Average size of workforce.
  - 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
  - 1. Identification of activities that have changed.
  - 2. Changes in early and late start dates.
  - 3. Changes in early and late finish dates.
  - 4. Changes in activity durations in workdays.
  - 5. Changes in the critical path.
  - 6. Changes in total float or slack time.
  - 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
  - 1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
  - 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
  - 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
  - 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
  - 5. In both value summary lists, tabulate "actual percent completed" and "cumulative value completed" with total at bottom.
  - 6. Submit value summary printouts one week before each regularly scheduled progress meeting.

**2.04 REPORTS**

- A. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
  - 1. Material stored prior to previous report and remaining in storage.
  - 2. Material stored prior to previous report and since removed from storage and installed.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

**2.05 SPECIAL REPORTS**

- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
  - 1. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
  - 1. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

**PART 3 EXECUTION**

- 3.01 PRECONSTRUCTION MEETINGS**
- A. Owner will schedule a meeting after Notice of Award.
  - B. Attendance Required:
    - 1. Owner.
    - 2. Architect.
    - 3. Contractor.
  - C. Agenda:
    - 1. Execution of Owner-Contractor Agreement.
    - 2. Submission of executed bonds and insurance certificates.
    - 3. Distribution of Contract Documents.
    - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
    - 5. Designation of personnel representing the parties to Contract and Architect.
    - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
    - 7. Scheduling.
  - D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

**3.02 PROGRESS MEETINGS**

- A. Schedule and administer meetings throughout progress of the work at maximum weekly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required:
  - 1. Contractor.
  - 2. Owner.
  - 3. Architect.
  - 4. Contractor's superintendent.
  - 5. Major subcontractors.
- D. Agenda:
  - 1. Review minutes of previous meetings.
  - 2. Review of work progress.
  - 3. Field observations, problems, and decisions.
  - 4. Identification of problems that impede, or will impede, planned progress.
  - 5. Review of submittals schedule and status of submittals.
  - 6. Maintenance of quality and work standards.
  - 7. Corrective measures to regain projected schedule.
  - 8. Planned progress during succeeding work period.
  - 9. Effect of proposed changes on progress schedule and coordination.
  - 10. Other business relating to work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

**3.03 PROGRESS PHOTOGRAPHS**

- A. Submit new photographs at least once a week, within 3 days after being taken.
  - 1. Photography Type: Digital, electronic files.
- B. In addition to periodic, recurring views, take photographs of each of the following events:
  - 1. Major construction activities.
  - 2. Take photographs as evidence of existing project conditions as follows:
    - 1. Interior views.
- E. Digital Photographs: 24 bit color, minimum resolution of minimum of 8 megapixels, in JPEG format; provide files unaltered by photo editing software.
  - 1. Delivery Medium: Via email.
  - 2. File Naming: Include project identification, date and time of view, and view identification.

**3.04 REQUESTS FOR INTERPRETATION (RFI)**

- A. Definition: A request seeking one of the following:
  - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference) or when an item of work is described differently at more than one place in Contract Documents.
  - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
  - 1. Prepare a separate RFI for each specific item.
    - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
    - b. Do not forward requests which solely require internal coordination between subcontractors.
  - 2. Prepare in a format and with content acceptable to Owner.
    - a. Use AIA G716 - Request for Information.
  - 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
  - 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
  - 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
    - a. Approval of





Table with 3 columns: NO., DATE, DESCRIPTION. Contains a header row and several empty rows for revisions.

- A. Install in accordance with manufacturer's instructions and comply with requirements for temperature and humidity.
B. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
C. Trim or overlap sheet materials to fit area to be covered.
D. Roll out and roll matted materials to fit area to be covered.
E. Tape seams. Avoid taping directly to finished surfaces.
F. Install door jamb protection to full height of opening.

3.03 PROTECTION OF MOSAIC TILE FEATURE

- A. Provide floor protection for artist's entry mosaic tile using minimum 1/2" thick. Protection may need to be temporarily installed between when artist is working and when Contractor is entering/exiting space.
B. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
C. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

3.04 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
2. Restore permanent facilities used during construction to their specified condition.
B. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

END OF SECTION 017610

SECTION 021000 DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of building elements for alteration purposes.
1. Procedures for demolition and removal of existing building elements.
2. Protection of existing construction.
3. Salvaged material and items.
4. Schedule of building demolition.
5. Disposal of demolished materials (non-hazardous and hazardous).
6. Site improvements including site utilities.

1.02 RELATED REQUIREMENTS

- A. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
B. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
C. Section 017419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for

1.03 DEFINITIONS

- A. Demolish: Dismantle, raze, destroy, or wreck any building or structure or any part thereof.
B. Remove: Detach or dismantle items from existing construction and dispose of them in place, unless items are indicated to be salvaged or reinstated.
C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.
D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.
E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstated.

1.04 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction, Current Edition.
B. 40 CFR 82 - Protection of Stratospheric Ozone, Current Edition.
C. ANSI A10.6 - Safety & Health for Demolition Operations, Current Edition.
D. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.05 SYSTEM DESCRIPTION

- A. Selective Demolition Requirements:
1. Perform demolition in construction sequence phases according to Construction Sequence Drawings.
2. Work necessary and required to facilitate the new construction indicated.
3. Demolish so that construction, new and existing, can be performed and completed in accordance with construction documents.
4. Visit the project site and become familiar with the existing conditions and project requirements.
5. Clarify the scope of the Work under this Section including salvaged material. The Owner will be responsible for removing materials and equipment which the Owner wishes to salvage prior to the beginning of this Work.
6. Retain existing fire protection sprinkler system in place and active.
7. Contractor is responsible for damage to existing structure and replacement or repair of damage.
8. Repair, replace, or rebuild existing construction as required or as directed which has been removed, altered, or disrupted to allow for new construction. Correct existing construction to match adjacent construction, new or existing as specified in 017000 - Execution and Closeout Requirements (Cutting and Patching).

B. Regulatory Requirements.

- 1. Obtain required permits from authorities having jurisdiction and submit to Owner.
2. Notify affected utility companies before starting work and comply with their requirements. Submit Certificates for severance of utility services and safety confirmation documentation of all utility company contacts to Owner.
3. Do not close or obstruct roadways, sidewalks, or hydrants without permits from authorities having jurisdiction and Owner's Construction Manager.
5. Comply with applicable regulatory procedures when discovering hazardous, contaminated, and universal waste materials.
6. Test soils around buried tanks for contamination (where buried tanks occur).

1.06 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Qualification data for the following:
1. Demolition contractor.
2. Professional engineer.
3. Professional geotechnical technician.
C. Proposed Protection and Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frames for their operation. Identify options if proposed measures are later determined to be inadequate. Includes measures for the following:
1. Environmental protection.
2. Dust control.
3. Noise control.
D. Schedule of Building Demolition / Repair Activities: Indicate detailed sequence of demolition, removal and repair work, with starting and ending dates for each activity, interruption of utility services, and locations of temporary protection and means of egress.

1.07 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
1. Minimum of five years of documented experience.
B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
C. Standards: Comply with all local codes and standards including but not limited to OSHA, ANSI A10.6 and NFPA 241.
D. Pre-demolition Conference: Conduct conference at Project site.
E. Performance Criteria:
1. Requirements of Structural Work: Do not cut structural work in a manner resulting in a reduction of load-carrying capacity of load-deflection ratio.
2. Operational and Safety Limitations: Do not cut operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in a manner intended or resulting in a decreased operational life, increased maintenance, or decreased safety.
3. Visual Requirements: Do not cut work which is exposed on the exterior or exposed in occupied spaces of the building in a manner resulting in a reduction of visual qualities or resulting in substantial evidence of the demolition work judged by the Architect to be out of place and in a visually unsatisfactory manner.
4. Loading: Do not superimpose loads at any point upon existing structure beyond design capacity including loads attributable to materials, construction equipment, demolition operations, and shoring and bracing.
5. Vibration: Do not use means, methods, techniques, or procedures which would induce vibration into any element of the structure.
6. Fire: Do not use means, methods, techniques, or procedures which would produce any fire hazard.
7. Water: Do not use means, methods, techniques, or procedures which would produce water run-off, or water and pollution.
8. Air Pollution: Do not use means, methods, techniques, or procedures which would produce uncontrolled dust, fumes, or other damaging air pollution.
F. Patch operations in a manner that provides a watertight/weatheright condition.
G. Employ skilled workers to perform cutting and patching.
H. Existing Warranties: Using methods and materials compatible with existing construction, remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, so as not to void existing warranties.

PART 2 PRODUCTS - NOT USED

3.01 DEMOLITION

- A. General: Demolish indicated existing buildings, structures, and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
2. Maintain adequate ventilation when using cutting torches.
3. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
B. Engineering Surveys: Perform surveys as the Work progresses to detect hazards that may result from building demolition activities.

- C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walkways, and other adjacent occupied and used facilities.
1. Do not close, obstruct, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, or pollution.
D. Reference Schedule of Demolition at end of this Section.
E. Remove other items indicated, for salvage, relocation, and recycling.

3.02 SURVEY EXISTING CONDITIONS AND CORRELATE WITH REQUIREMENTS INDICATED TO DETERMINE EXTENT OF BUILDING DEMOLITION REQUIRED.

- A. Review Project Record Documents of existing construction provided by Architect. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
B. Inventory and record the condition of items to be removed and salvaged.
C. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Architect.
D. Demolition contractor to have engineering consultants on retainer for review of special conditions.
1. OSHA regulations require that a "competent person" perform an engineering survey before building demolition begins.
2. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
E. Retain below hazardous material remediation is part of the Work of this Contract.
F. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.03 PREPARATION

- A. Ensure safe passage of persons around area of demolition.
B. Protect existing finish work to remain in place.
C. Protect floors with suitable covering.
D. Rebar/cast-in-place concrete and steel reinforcement according to 40 CFR 82 and regulations of authorities having jurisdiction.
E. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
F. Removed and Salvaged Items: Comply with the following:
1. Clean salvaged items of dirt and debris.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.
G. Cease operations and notify Owner's Construction Manager immediately if safety or structure appears to be endangered.
1. Take precautions to support structure until determination is made for continuing operations.

3.04 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with requirements in Section 017000.
B. Buildings to be demolished will be vacated and they are discontinued before start of Work.
C. Arrange demolition schedule so as not to interfere with Building Owner's, Adjacent Tenants', or on-site operations.
D. Owner will occupy another building immediately adjacent to demolition area. Conduct building demolition so Owner's operations will not be disrupted.
1. Provide not less than 72 hours notice to Construction Manager of activities that will affect operations.
2. Maintain access to existing walkways, exits, and other adjacent occupied or used facilities.
E. Owner assumes responsibility for buildings and structures to be demolished.
1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
2. Before building demolition, Owner will remove the following items:
a. To be determined by Building Owner at time of Pre-Demolition meeting with Contractor.
F. Comply with applicable codes and regulations of demolition operations and safety of adjacent structures and the public.
1. Obtain required permits.
2. Use of explosives is not permitted.
3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
4. Provide, erect, and maintain temporary barriers and security devices.
5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
7. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
8. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.
G. Do not begin removal until receipt of notification to proceed from Owner.
H. Do not begin removal until all elements to be salvaged or relocated have been removed.
I. Do not begin removal until vegetation to be relocated has been removed and vegetation to remain has been protected from damage.
J. Protect existing structures and other elements to remain in place and not removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

K. Hazardous Materials

- 1. If hazardous materials are discovered during removal operations, stop work and notify Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.
2. Hazardous materials will be removed by Owner before start of the Work.
3. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect/Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
L. Mold and Mildew: The following requirements shall apply to all new and remodel construction projects.
1. In the event the contractor discovers, at any time during demolition, construction and/or remodeling operations, existing conditions that could include the presence of mold and/or mildew, the contractor shall immediately notify the tenant's representative and the professional of record, in writing, of the concerns and/or conditions.
2. Concurrently, the contractor shall be responsible to retain a mold and mildew certified testing agency to perform an investigation and testing as required to evaluate the nature and extent of the problem. If the testing agency confirms hazards, the contractor shall be responsible to obtain a minimum of two (2) bids from companies qualified and licensed to perform all necessary remediation work, complying with all local, state and federal environmental regulations, codes, and statutes.
3. Once discovery or suspicion of mold and/or mildew is made, the contractor shall take all responsible measures and practice precautions to protect all construction personnel and the public from exposure to mold and/or mildew, and such precautions shall remain in place until such a time as the owner or health authority directs otherwise. Construction operations shall not be stopped or curtailed, except in the area of mold and mildew, until the required remediation is complete.
4. The contractor shall make all reasonable efforts to avoid conditions favorable to the development of mold and mildew, especially in voids which will be concealed and not ventilated. In all cases, interior spaces and interior finished construction shall be maintained in dry and well-ventilated conditions.
5. The contractor shall comply with federal environmental and osha regulations and all local and state health department requirements and recommendations regarding mold and mildew.
6. All project walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
7. Ensure that there are no water leaks in concealed plumbing chases. All existing supply air paths and all existing return air paths and plenums shall be kept dry.
8. Ductwork to be removed shall be cleaned and tagged as required to remove potential for mold and mildew, all damp areas shall be dried thoroughly prior to enclosure.

M. Storage or sale of removed items or materials on-site is not permitted.

3.05 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction and approval by Owner's Construction Manager.
D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
F. Locate and mark utilities to remain, mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
H. Provide temporary services during interruptions to existing utilities as acceptable to governing authorities.
I. Provide tie-pass connections as necessary to maintain continuity of service to occupied areas of building.
J. Provide advance notice to Owner of shut-down of service is necessary during change-over.
3.06 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
1. Verify construction and utility arrangements are as indicated.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
B. Remove existing work as indicated and required to accomplish new work.
1. Remove items indicated on drawings.
C. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of origin where possible to remove pipe cap shut and tag with identification.
D. Protect existing work to remain:
1. Provide temporary shoring, bracing and supports for building structure as required for support of structure during demolition of existing structural elements and to prevent movement, settlement of existing building and adjacent buildings and facilities to remain.
2. Prevent movement of structure. Provide shoring and bracing as required.
3. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
4. Repair adjacent construction and finishes damaged during removal work.
5. Patch to match new work.

3.07 MECHANICAL DEMOLITION

- A. Remove buildings, structures, and site improvements intact when permitted by authorities having jurisdiction.
B. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on next lower level.
C. Remove debris from elevated portions by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
1. Remove structural framing members and lower to ground by method suitable to minimize ground impact or dust generation.
D. Concrete: Cut concrete full depth at junctures with construction indicated to remain, using power-driven saw, then remove concrete between saw cuts.
E. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished at junctures with construction indicated to remain, then break up and remove.
F. Carpet and Pad: Remove in large pieces and roll tightly after removing demolition debris, trash, adhesive, and tack strips.
G. Building Components: Remove the following components, as whole units, intact and undamaged.
1. Doors.
2. Windows.
3. Door hardware.

- 4. Mirrors.
5. Toilet fixtures and accessories.
6. Plumbing fixtures.
7. Light fixtures.
H. Equipment: Disconnect equipment at nearest fitting connection to services, complete with service valves. Remove as whole units, complete with controls.
I. Below-Grade Construction:
1. Abandon foundation walls and other below-grade construction as indicated on construction drawings or as directed by Architect. Cut below-grade construction minimum 12" below finish grade / floor slabs.
2. Demolish existing concrete slabs, foundation walls, grade beams and other below-grade construction as referenced in the geotechnical report or as indicated on construction drawings or as directed by Architect.
3. If existing foundations are discovered during construction activities that are not shown on the Construction Drawings, for clarification of Demolition or Abandonment, the contractor shall notify Architect and Owner, survey the locations, and note them on the as built plans as a record of the location.
4. If drilled footings are present, the shafts are to be broken off at an elevation about 24 inches below the bottom of proposed new foundations. If portions of drilled footings are left in place the General Contractor is to survey the locations and note them on the as built plans as a record of the locations.

- J. Existing Utilities:
1. Abandon and remove existing utilities and below-grade utility structures. Cut utilities (cap and plug) minimum 12" below finish grade and floor slabs. Service lines that are not being reused are to be cut and capped to a point not further than 5'-0" outside the building footprint.
2. Contractor shall notify Architect and Owner regarding existing utilities discovered during construction activities that are not shown on the Construction Drawings for clarification of Demolition or Abandonment.
K. Demolish and remove existing utilities and below-grade utility structures.
3.08 EXPLOSIVE DEMOLITION
A. Explosives: Use of explosives is not permitted.
3.09 SITE RESTORATION
A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Section 31100 - Site Clearing.

3.10 REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by building demolition operations.
B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.11 CUTTING AND PATCHING

- A. Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the work or to make components fit together properly. Cut existing construction to provide for installation of components or to perform other construction, and patch as required matching surfaces to their original condition.
B. Contractor shall not damage any portion of the work by cutting, patching or modifying any work, or by excavation.
1. Contractor shall not cut or make alterations to the work without the written consent of the Construction Manager/Architect.
2. Contractor shall not withdraw from the Construction Manager/Architect or any separate contractor his consent to cutting or otherwise altering the work.
C. Prior to commencing work, examine surfaces to be cut and patched, and conditions under which cutting and patching are to be performed.
1. Prior to patching, verify compatibility of existing materials and materials to be used.
2. Proceed with work after unsafe or unacceptable conditions have been corrected.
D. Provide temporary support of Work to be cut. Protect existing construction during cutting and patching to prevent damage. Provide protection of work from adverse weather conditions that might be exposing during cutting and patching operations.
E. Cut existing construction by grinding, drilling, breaking, chipping, grinding, and similar operations, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original installer; comply with original installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chipping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
F. Proceed with patching after construction operations requiring cutting are complete.
G. Patch construction by filling, repairing, infilling, closing up, and similar operations following other work. Patch with durable seams that are as invisible as possible.
1. Where applicable, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where walls or partitions are removed extend one finished area into another, patch and repair floor and wall surfaces in the new area. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.12 ENVIRONMENTAL CONTROLS

- A. Use water sprinkling, temporary enclosures, and other proper control methods to maintain airborne dust and dirt below permissible levels.
B. Comply with governing regulations pertaining to environmental protection.
C. Do not use water when it may create hazardous or objectionable conditions, such as ice, flooding, or pollution.
D. For work scheduled in this section including cutting and breaking of masonry, concrete slab below or on grade, walls, foundation work or footings, use tools equipped with integrated water delivery systems that continuously feed water to the blade or a HEPA-rated filter dust collection vacuum system recommended by the manufacturer to maintain dust emissions below the permissible level.

3.13 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, building entries, and other building facilities during demolition operations.
B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during demolition and reinstalled in their original locations after demolition operations are complete.
C. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.
1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
a. Provide at least 72 hours notice to Owner in writing if shutdown of service is required during changeover.
D. Temporary Protection: Erect temporary protection, such as fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 015000 - Temporary Facilities and Controls.
1. Protect existing site improvements, appurtenances, and landscaping to remain.
2. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
3. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
4. All project walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

3.14 RECYCLING DEMOLISHED MATERIALS

- A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
1. Provide containers or other storage method approved by Architect for controlling recyclable materials until they are removed from Project site.
2. Stockpile processed materials on-site without intermingling with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Transport recyclable materials off Owner's property and legally dispose of them.
B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling building demolition materials shall accrue to Owner.
3.15 DEBRIS AND WASTE REMOVAL
A. Remove debris, junk, and trash from site.
B. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
1. Burning: Do not burn demolished materials.
2. Disposal: Transport demolished materials off Owner's property and legally dispose of them.
C. Leave site in clean condition, free for subsequent work.
D. Clean up spillage and wind-blown debris from public and private lands.

3.16 POLLUTION CONTROLS

- A. Use temporary enclosures and other proper control methods to maintain airborne dust and dirt below permissible levels.
B. Comply with governing authorities pertaining to environmental protection.
C. Clean adjacent portion of the structure and improvement of dust, dirt and debris caused by demolition operations, as directed by the Owner's Construction Manager and governing authorities. Return adjacent areas to conditions existing prior to the start of the work.
D. Burning of trash, debris, or removed materials not permitted on site.

3.17 SCHEDULE OF SELECTIVE DEMOLITION

- A. Remove and dispose of existing building items and adjacent site work items as required for Work and as indicated on Drawings.
B. Interior Slab on Grade:
1. Strip existing concrete floor slab of all sealers and coatings and prepare slab for new finishes installation per Section 090501 - Common Work Results for Flooring Preparation.
2. Locate portion of existing concrete slab to be removed. Saw cut perimeter of existing slab minimum of 50% of slab thickness to provide a breaking point to remove concrete.
3. Wet saw concrete slabs along straight lines to a minimum depth of 2 inches where concrete is to be removed. The method of removal shall maintain the undamaged slab edge within the sawed line. Jack hammers may be used only "after hours" and with permission from the Owner's Representative and a hot spot check hammer may not be used to remove concrete from the existing slab, but only to break up concrete which has already been saw cut from the concrete slab.
a. Jack hammers shall be equipped with field assembled water delivery systems that supply a continuous stream or spray of water at the point of impact of HEPA-rated filter dust collection vacuum system recommended by the manufacturer to maintain dust emissions below the permissible level.
4. Break concrete slabs to be removed into portions easily removed, maximum 3 feet dimension at any side.
5. Remove concrete pieces within removed area down to the existing subgrade.
C. Below Grade Construction:
1. Remove below grade construction including foundation work, column footings, and abandon mechanical, plumbing, and electrical work as indicated.
D. Interior Walls and Partitions:
1. Remove interior walls and partitions as indicated.
2. Remove all top and bottom framing tracks and overhead braces of partitions being removed.
E. Doors and Frames:
1. Remove hollow metal doors and frames.
2. Remove aluminum storefront doors and frames.
3. Remove aluminum automatic doors and frames.
F. Mechanical System:
1. Remove mechanical equipment and related ductwork as indicated.
2. Doors.
3. Remove accessories to the mechanical system including, but not limited to, hanger straps.

- G. Plumbing:
1. Remove plumbing fixtures and accessories including exposed supply, waste, and vent piping as indicated.
2. Identify concealed piping within and below slab construction and cap a minimum of 3 inches below finish floor unless otherwise noted.
3. Cap or plug ends of below grade abandoned sewer and drain pipe and vents. Abandoned branch drains connected to a live line shall be capped within two feet of connection to the live line.
H. Electrical Service:
1. Remove abandoned electrical fixtures, conduit, boxes, and wiring as indicated.
2. Remove electrical circuits including conduit as indicated.

3.18 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations.
B. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION 021000

DIVISION 05 - METALS SECTION 054000 COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Formed steel stud interior wall framing.
1.02 RELATED REQUIREMENTS
A. Section 082216 - Non-Structural Metal Framing.
1.03 DEFINITIONS
A. General: See AISI S240 for definitions of terms used in this section.
B. Connection: A combination of structural elements and joints used to transmit forces between two or more members.
C. Connector: A device used to transmit forces between cold-formed steel structural members or between a cold-formed steel structural member and another structural element.

1.04 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
B. AISI S200 - North American Specification for Cold-Formed Steel Framing - General Provisions; 2012.
C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referencing Code or Reference Standard.
E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
G. ASTM A1029/A1029M - Standard Specification for Steel Sheet, Carbon, Unalloyed, and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
H. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Revised/2024).
I. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Construction Systems; 2024.
J. ASTM E529 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025a.
K. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
L. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
M. ICC-ES AC709 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements; 2019, with Editorial Revision (2021).

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with other work sections that is to be installed in or adjacent to metal framing systems, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.
B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

1.06 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
1. Cold-formed steel framing materials.
2. Vertical deflection clips.
3. Single deflection track.
4. Double deflection track.
5. Drill clips.
6. Post-installed anchors.
7. Power-actuated anchors.
C. Product Data: Provide manufacturer's data on factory-made connectors and mechanical fasteners, showing complete work and requirements.
D. Shop Details: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing, fabrication, and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
E. Design Data:
1. Shop drawings signed and sealed by a professional structural engineer.
2. Design calculations sufficient to demonstrate compliance with design criteria; signed and sealed by a professional structural engineer.
F. Product Certificates: For each type of code-compliance certification for studs and tracks.
G. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
1. Cold-formed steel framing materials.
2. Expansion anchors.
3. Power-actuated anchors.
4. Mechanical fasteners.
5. Vertical deflection clips.
6. Double deflection track.
7. Horizontal drift deflection clips.
8. Miscellaneous structural clips and accessories.
H. Inspection Reports: Provide material verification Inspection Reports in accordance with requirements of AISI S240.

1.07 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a professional structural engineer experienced in designing this work and licensed in the State in which the Project is located.
B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.
C. Testing Agency Qualifications: Qualified according to ASTM E529 for testing indicated.
D. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
1.08 DELIVERY, STORAGE, AND HANDLING
A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling in accordance with AISI S202.

- C. Welding: Comply with AWS D1.1/D1.1M.
D. Mechanical Fasteners: ASTM C153, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
E. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

2.07 ACCESSORIES: A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.

- B. Galvanizing Repair: Touch up bare steel with zinc-rich paint in compliance with ASTM A780/A780M.
C. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing
2. Bracing, bridging, and solid blocking
3. Web stiffeners
4. Anchor clips
5. End clips
6. Foundation clips
7. Stud kickers and knee braces
8. Joist hangers and end closures
9. Hole-reinforcing plates
10. Backer plates.

2.08 FABRICATION: A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

- 1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
a. Comply with AWS D1.3D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in connecting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.

- B. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
1. Spacing: Spaces individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

2.09 EXAMINATION: A. Verify that substrate surfaces are ready to receive work.

- 1. Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES E-570.
B. Verify field measurements and adjust installation as required.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

2.10 INSTALLATION - GENERAL: A. Install structural members and connections in compliance with ASTM C1007.

- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
a. Comply with AWS D1.3D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in connecting welding work.
b. Locate mechanical fasteners, install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
c. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.

- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
G. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

2.11 INSTALLATION OF STUDS: A. Install wall studs plumb and level, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

- B. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jams.
C. Install load-bearing studs full length in one piece. Splicing of studs is not permitted.
D. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
E. Install load-bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
F. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
G. Provide deflection allowance in stud track, directly below horizontal building framing at non-load-bearing framing.
H. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
I. Touch-up field welds and damaged corrosion-protected surfaces zinc-rich paint in compliance with ASTM A780/A780M.
J. Touch-up field welds and damaged corrosion-protected surfaces with primer.
K. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
1. Stud Spacing: As indicated on Drawings.
L. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support as indicated on Drawings.
1. Install single deep-leg deflection tracks and anchor to building structure where indicated on Drawings.
2. Install double deep-leg deflection tracks and anchor outer track to building structure where indicated on Drawings.
3. Connect vertical deflection clips to toppling studs and anchor to building structure as indicated on the Drawings.
4. Connect drift clips to cold-formed steel framing and anchor to building structure as indicated on the Drawings.
M. Install horizontal bridging in wall studs, spaced vertically in rows indicated but not more than 48 inches apart. Fasten at each stud intersection.
1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
N. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track stud block blocking of width and thickness matching studs, secured to stud webs or flanges.
1. Install solid blocking at 96-inch centers.
O. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

2.12 FIELD QUALITY CONTROL: A. See Section 01000 - Quality Requirements, for additional requirements.

- B. Provide material verification inspections in accordance with requirements of AISI S240.

2.13 TOLERANCES: A. Studs - Vertical Alignment (Plumbness): 1/960 of span or 1/8 inch in 10 ft, in accordance with ASTM C1007.

- B. Studs - Maximum Variation from True Position: 1/8 inch in accordance with ASTM C1007.
C. Stud Spacing: 1/8 inch from the designated spacing, provided that the cumulative error does not exceed the requirements of the finishing materials in accordance with ASTM C1007.

2.14 PROTECTION: A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES SECTION 06103 MISCELLANEOUS ROUGH CARPENTRY

2.01 FINISH CARPENTRY ITEMS SECTION 06200 FINISH CARPENTRY

2.02 LUMBER MATERIALS SECTION 06316 FIBERGLASS REINFORCED PANELING

2.03 ACCESSORIES SECTION 06316 FIBERGLASS REINFORCED PANELING

2.04 FABRICATION SECTION 06316 FIBERGLASS REINFORCED PANELING

2.05 SHOP FINISHING SECTION 06316 FIBERGLASS REINFORCED PANELING

2.06 DELIVERY, STORAGE, AND HANDLING SECTION 06316 FIBERGLASS REINFORCED PANELING

2.07 ACCESSORIES SECTION 06316 FIBERGLASS REINFORCED PANELING

2.08 FABRICATION SECTION 06316 FIBERGLASS REINFORCED PANELING

2.09 EXAMINATION SECTION 06316 FIBERGLASS REINFORCED PANELING

2.10 INSTALLATION SECTION 06316 FIBERGLASS REINFORCED PANELING

2.11 RELATED REQUIREMENTS SECTION 06316 FIBERGLASS REINFORCED PANELING

2.12 REFERENCE STANDARDS SECTION 06316 FIBERGLASS REINFORCED PANELING

2.13 SUBMITTALS SECTION 06316 FIBERGLASS REINFORCED PANELING

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2.144 GENERAL SECTION 06316 FIBERGLASS REINFORCED PANELING

2.145 SECTION INCLUDES SECTION 06316 FIBERGLASS REINFORCED PANELING

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- F. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.
- G. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Waterproofing Sealant Joints; 2019 (Reapproved 2025).
- H. SCAQMD 1185 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

**1.04 QUALITY ASSURANCE**

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
  - 1. Adhesion Testing: In accordance with ASTM C794.
  - 2. Compatibility Testing: In accordance with ASTM C1087.
  - 3. Allow sufficient time for testing to avoid delaying the work.
  - 4. Deliver sufficient samples to manufacturer for testing.
  - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
  - 6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.
- D. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
  - E. Field Quality Control Plan:
    - 1. Visual inspection of entire length of sealant joints.
    - 2. Nondestructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
    - 3. Field testing agency's qualifications.
    - 4. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.
- F. Field Adhesion Test Procedures:
  - 1. Allow sealants to fully cure as recommended by manufacturer before testing.
  - 2. Have a copy of the test method document available during tests.
  - 3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
  - 4. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
  - 5. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
  - 6. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.
- G. Nondestructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.

**PART 2 PRODUCTS**

- 2.01 MANUFACTURERS**
  - A. Nonsag Sealants:
    - 1. Dow: [www.dow.com/usa](http://www.dow.com/usa).
    - 2. Pecora Corporation: [www.pecora.com/usa](http://www.pecora.com/usa).
    - 3. Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com/usa](http://www.tremcosealants.com/usa).

**2.02 JOINT SEALANT APPLICATIONS**

- A. Scope:
  - 1. Interior Joints:
    - a. Do not seal interior joints indicated on drawings as not sealed.
    - b. Do not seal through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
    - c. Seal open joints except specific open joints indicated on drawings as not sealed.
  - 2. Exterior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.

**2.03 JOINT SEALANTS - GENERAL**

- A. Sealants and primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1188.

**2.04 NONSAG JOINT SEALANTS**

- A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
  - 1. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
  - 2. Color: Match adjacent finished surfaces.
  - 3. Service Temperature Range: Minus 20 to 180 degrees F.
  - 4. Products:
    - a. Dow: DOWSIL 719 Silicone Weatherproofing Sealant, Carbon Neutral: [www.dow.com/usa](http://www.dow.com/usa).
    - b. Pecora Corporation: Pecora 864 NST (Non-Staining Technology): [www.pecora.com/usa](http://www.pecora.com/usa).
    - c. Tremco Commercial Sealants & Waterproofing: Spectrum 1: [www.tremcosealants.com/usa](http://www.tremcosealants.com/usa).
    - d. Tremco Commercial Sealants & Waterproofing: Spectrum 2: [www.tremcosealants.com/usa](http://www.tremcosealants.com/usa).
    - e. Tremco Commercial Sealants & Waterproofing: Spectrum 3: [www.tremcosealants.com/usa](http://www.tremcosealants.com/usa).
    - f. Sonosonic 150 by BASF (Sonnomer).
- B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
  - 1. Color: White.
  - 2. Products:
    - a. Pecora Corporation: Pecora 898 NST (Non-Staining Technology): [www.pecora.com/usa](http://www.pecora.com/usa).
    - b. Tremco, Tremal 600.
    - c. Dow, 796 Silicone Sealant (Non-USDA).
    - d. GE, Sanitary SCS 1700 (Non-USDA).
- C. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
  - 1. Color: Match adjacent finished surfaces.
  - 2. Service Temperature Range: Minus 40 to 180 degrees F.
  - 3. Products:
    - a. Pecora Corporation: Urepanx NR-201
    - b. Tremco Commercial Sealants & Waterproofing: Vulkem 45 (Non-USDA) or Vulkem 45SSSL (Non-USDA): [www.tremcosealants.com/usa](http://www.tremcosealants.com/usa).
    - c. Sonnomer, Sonosonic SL-1.

**2.05 ACCESSORIES**

- A. Prefromed Expansion (Isolation) Joint Filler (PMEJ) Strips: Flexible closed-cell synthetic foam expansion joint strips, non-extruding, for full depth of concrete.
  - 1. Certamer Flexible Foam Expansion Joint, by W.R. Meadows.
  - 2. Deck-O-Foam Expansion Joint Filler, by W.R. Meadows.
  - 3. Expansion Joint Filler, by BASF Building Systems (Degussa) (Formerly Sonnomer Sonosonic).
- B. Joint Filler Stain Preventing Film:
  - 1. SPF by Metzger/McGure.
  - 2. Eucro CleanCut by Euclid.
- C. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturer for specific application.
- D. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- E. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- F. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.
- D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
  - 1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
  - 2. Notify Architect of date and time that tests will be performed, at least seven days in advance.
  - 3. Record each test on Preinstallation Field Adhesion Test Log as indicated.
  - 4. If any sample fails, review products and installation procedures, consult manufacturer, or take other measures that are necessary to ensure adhesion; retest in a different location, if unable to obtain satisfactory adhesion, report to Architect.
  - 5. After completion of tests, remove remaining sample material and prepare joints for new sealant installation.

**3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

**3.03 INSTALLATION**

- A. Install the work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backer to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- E. Install bond breaker backing tape where manufacturer cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

**3.04 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- C. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- D. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION 079200

**DIVISION 08 - OPENINGS**  
**SECTION 081416**  
**FLUSH WOOD DOORS**

**PART 1 GENERAL**

- 1.01 SECTION INCLUDES**
  - A. Flush wood doors, flush configuration, non-rated.
  - B. Frameless wood door system.
- 1.02 RELATED REQUIREMENTS**
  - A. Section 062000 - Finish Carpentry: Wood door frames.
  - B. Section 099300 - Stairing and Transparent Finishing: Field finishing of doors.
- 1.03 REFERENCE STANDARDS**

- A. AIA/WMAACWI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- C. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

**1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
  - B. Product Data: Indicate door core materials and construction, veneer species, type and characteristics.
  - C. Samples: Submit two samples of door veneer, 8 by 8 inches in size illustrating wood grain, stain color, and sheen.
- 1.05 QUALITY ASSURANCE**
- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
  - B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
  - C. All materials and systems shall fully comply with ADAAG.
  - D. Comply with requirements of the ANSIVDMA I.S. 1A A-13 Interior Architectural Wood Flush Doors.
  - E. Conform to requirements of AWI Quality Standards Section 1300, Architectural Flush Doors.
  - F. Installed Doors: Conform to NFPA 80 for fire rated class indicated where required by Code.
  - G. All doors shall be provided by the same manufacturer to ensure uniformity of quality and appearance.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrink plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with linted sealer if stored more than one week, and break seal on site to permit ventilation.
- D. Do not deliver wood doors to jobsite until weatherproof storage is available. Store doors in a space having controlled temperature and a relative humidity between 30 - 60%. Protect doors from direct exposure to sunlight.
- E. Stack doors flat, off the floor and supported to prevent warpage. Do not walk or place other material on top of stacked doors. Do not drag doors across one another.

**1.07 WARRANTY**

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Warranty: Provide written two (2) year warranty signed by door manufacturer, installer and Contractor agreeing to replace defective door. Door defects include, but are not limited to the following:
  - 1. De-lamination in any degree.
  - 2. Warp or twist of 1/4" or more in any 3' 0" x 7' 0" section of a door.
  - 3. Telegraphing of any part of core assembly through face veneer to cause surface variation of 1/100" or more in a 3' span.
  - 4. Other defects which affect performance of door.
- C. Warranty shall cover the cost of refitting, installation of hardware and re-hanging defective doors. Warranty shall be in effect for the following time periods:
  - 1. Provide manufacturer's warranty for life of install on all solid core and hollow core wood doors.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Wood Veneer Faced Doors:
  - 1. Krieger Specialty Products: [www.kriegerproducts.com/usa](http://www.kriegerproducts.com/usa).
  - 2. Forte Opening Solutions: [www.forteopenings.com/usa](http://www.forteopenings.com/usa).
  - 3. Oregon Door: [www.oregondoor.com/usa](http://www.oregondoor.com/usa).
  - 4. Vancouver Architectural Doors: [www.vancouverdoorco.com/usa](http://www.vancouverdoorco.com/usa).
  - 5. VT Industries, Inc: [www.vtindustries.com/usa](http://www.vtindustries.com/usa).
  - 6. Substitutions: See Section 016000 - Product Requirements.
- B. Doors: See drawings for locations and additional requirements.
  - 1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AIA/WMAACWI (AWS), unless noted otherwise.
  - 2. Wood Veneer Faced Doors: Sply, unless otherwise indicated.
- C. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
  - 1. Provide solid core doors at each location.
  - 2. Wood veneer facing for field transparent finish as indicated on drawings.

**2.02 DOORS AND PANEL CORES**

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

**2.03 DOOR FINISHES**

- A. Veneer Facing for Transparent Finish: Walnut, veneer grade in accordance with quality standard indicated; plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face; unless otherwise indicated.

**2.06 DOOR CONSTRUCTION**

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
  - 1. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
  - 2. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- C. Provide edge clearances in accordance with the quality standard specified.

**2.06 FRAMELESS WOOD DOORS**

- A. General: Frameless door system flush installed with Sales wall.
- B. Location: Door 100A at POS / Sales
- C. Manufacturer:
  - 1. EZ Concept; [www.ezconcept.com; phone: 888-399-5262](http://www.ezconcept.com; phone: 888-399-5262).
- D. Model: The Door Suite by EZ Concept.
  - 1. Door: EzyDoor Premium Doors
  - 2. Frame: EzyJamb: ISD - Premium Inswing Door Jamb.
  - 3. Hinges: Roc'Rock concealed hinges by EZ Concept.
  - 4. Finish: As selected by Architect from manufacturer's full range of finishes.
- E. Size: As indicated in the Drawings.
- F. Color: As indicated in the Drawings.

**2.07 FINISHES - WOOD VENEER DOORS**

- A. Finish work in accordance with AIA/WMAACWI (AWS), Section 5 - Finishing for grade specified and as follows:
  - 1. System - 9, UV Curable, Acrylated Epoxy, Polyester or Urethane.
  - 2. Stain: As selected by Architect.
  - 3. Sheen: Satin.
- B. Factory finish doors in accordance with approved sample.

**2.08 ACCESSORIES**

- A. Wood Door Frames: See Section 062000.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.
- D. Examine door frames and verify that frames are correct type and have been installed for proper hanging of corresponding doors.

**3.02 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. Factory-Finished Doors: Do not feel cut or trim; if fit or clearance is not correct, replace door.
  - 1. Use rasping tools to cut or drill for hardware.
  - 2. Pilot drill screw and bolt holes for surface applied hardware items.
  - 3. Prepare doors to receive surface mounted finish hardware in accordance with AWI requirements.
  - 4. Coordinate installation of doors with installation of frames and hardware.
  - 5. Condition doors to average prevailing humidity in installation area prior to hanging.

**3.03 TOLERANCES**

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squariness.
- C. Maximum Diagonal Distortion: 1/16" measured with straight edge, corner to corner.

**3.04 ADJUSTING AND PROTECTION**

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.
- C. Re-hang or replace doors which do not swing or operate freely. Refinish or replace doors damaged during installation.
- D. Protect doors as recommended by door manufacturer to ensure that doors will not be damaged after installation.

END OF SECTION 081416

**SECTION 083100**  
**ACCESS DOORS AND PANELS**

**PART 1 GENERAL**

- 1.01 SECTION INCLUDES**
  - A. Wall-mounted access units.
- 1.02 QUALITY ASSURANCE**
  - A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

**PART 2 PRODUCTS**

- 2.01 WALL-MOUNTED ACCESS UNITS**
  - A. Manufacturers:
    - 1. ACUDOR Products Inc; FW-5050-ACF: [www.acudor.com/usa](http://www.acudor.com/usa).
    - a. Wall- and Ceiling-Mounted Units: ACUDOR DW-5058.
    - 2. Milcor, Inc: [www.milcorinc.com/usa](http://www.milcorinc.com/usa).
    - a. Model M 3202.
    - 3. Rystrom, Inc: [www.rystrom.com/usa](http://www.rystrom.com/usa).
    - a. Model NT
  - B. Wall-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
    - 1. Material: Steel
    - 2. Style: Exposed frame with door surface flush with frame surface.
    - 3. Door Style: Single thickness with rolled or turned in edges.
    - 4. Frames: 16-gauge, 0.0558-inch minimum thickness.
    - 5. Steel Finish: Primed.
    - 6. Painted and Factory Finish: Polyester powder coat; color as selected by Architect from manufacturer's standard colors.
    - 7. Hardware:
      - a. Hinges for Non-Fire-Rated Units: Concoiled, constant force closure spring type.
      - b. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

**3.03 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION 083100

**DIVISION 09 - FINISHES**  
**SECTION 090961**  
**COMMON WORK RESULTS FOR FLOORING PREPARATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
  - 1. Broadloom carpet.
  - 2. Thin-set ceramic tile and stone tile.
  - 3. Mosaic Tile.
- B. Preparation of existing concrete floor slabs for installation of floor coverings.
  - C. Testing of concrete floor slabs for Internal Relative Humidity and alkalinity (pH).
  - D. Remediation of concrete floor slabs due to unsatisfactory Internal Relative Humidity or alkalinity (pH) conditions.
    - 1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.
- E. Self-Leveling Underlayment.
- F. Remedial Floor Coating.
- G. Remedial floor treatment.

**1.02 RELATED REQUIREMENTS**

- A. Section 014000 - Quality Requirements: Additional requirements relating to testing agencies and testing.

**1.03 REFERENCE STANDARDS**

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2023.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

**1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Visual Observation Report: For existing floor coverings to be removed.
- C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
  - 1. Internal Relative Humidity and alkalinity (pH) limits and test methods.
  - 2. Manufacturer's required bond/compatibility test procedure.
- D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
  - 1. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
  - 2. Manufacturer's installation instructions.
  - 3. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- E. Testing Agency's Report:
  - 1. Description of areas tested, include floor plans and photographs if helpful.
  - 2. Summary of conditions encountered.
  - 3. Internal Relative Humidity and alkalinity (pH) test reports.
  - 4. Copies of specified test methods.
  - 5. Recommendations for remediation of unsatisfactory surfaces.
  - 6. Product data for recommended remedial coating.
  - 7. Submit report to Architect.
  - 8. Submit report not more than two business days after conclusion of testing.
- F. Adhesive Bond and Compatibility Test Report.
- G. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician-Grade 1 certificate.

**1.06 QUALITY ASSURANCE**

- A. Internal Relative Humidity and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.
- B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
  - 1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- C. Contractor's Responsibility Relating to Independent Agency Testing:
  - 1. Provide access for and cooperate with testing agency.
  - 2. Confirm date of start of testing at least 10 days prior to actual start.
  - 3. Allow at least 4 business days on site for testing agency activities.
  - 4. Achieve and maintain specified ambient conditions.
  - 5. Notify Architect when specified ambient conditions have been achieved and when testing will start.
- D. Floor Internal Relative Humidity Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification - Grade 1.
- E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

**1.08 FIELD CONDITIONS**

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Self-Leveling Underlayment:
  - 1. Cementitious; moisture, mildew and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
    - a. Gypsum content is prohibited.
    - b. Patching compounds are prohibited.
  - 2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
  - 3. Products:
    - a. ARDEX Engineered Cementitious; ARDEX Feather Finish: [www.ardexamericas.com/usa](http://www.ardexamericas.com/usa).
    - b. LATCRETE International, Inc; NXXT Level Plus: [www.laticrete.com/usa](http://www.laticrete.com/usa).
    - c. UZIN UTZ North America; UZIN NC 170 Premium Plus Self-Leveling Compound: [www.us.uzin.com](http://www.us.uzin.com).
    - d. Substitutions: See Section 016000 - Product Requirements.
- B. Remedial Floor Coating: Single or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
  - 1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
  - 2. Products:
    - a. ARDEX Engineered Cementitious; ARDEX MO RAPID: [www.ardexamericas.com/usa](http://www.ardexamericas.com/usa).
    - b. LATCRETE International, Inc; LATCRETE VAPOR BAN E: [www.laticrete.com/usa](http://www.laticrete.com/usa).
    - c. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer: [usa.sika.com/usa](http://usa.sika.com/usa).
    - d. UZIN UTZ North America; UZIN PE 460 with UZIN PE 260 and UZIN NC 170 LevelStar: [usa.uzin.com/usa](http://usa.uzin.com/usa).
    - e. Substitutions: See Section 016000 - Product Requirements.

**PART 3 EXECUTION**

**3.01 CONCRETE SLAB PREPARATION**

- A. Perform following operations in the order indicated:
  - 1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
    - a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
    - b. Removal of existing floor covering.
  - 2. Preliminary cleaning.
  - 3. Internal Relative Humidity tests: 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
    - a. Anhydrous Calcium Chloride testing is not acceptable.
    - 4. Alkalinity (pH) tests, in same locations as moisture vapor emission tests, unless otherwise indicated.
  - 5. Specified remediation, if required.
  - 6. Leveling with Self-Leveling Underlayment, as required.
  - 7. Other preparation specified.
  - 8. Adhesive bond and compatibility test.
  - 9. Protection.
- B. Remediation:
  - 1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
  - 2. Excessive Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
  - 3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skin coat of specified patching compound over entire suspect floor area.

**3.02 PRELIMINARY CLEANING**

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laticrete, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

**3.03 INTERNAL RELATIVE HUMIDITY TESTING**

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer



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- C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
E. Colors: As indicated on the Drawings.

- 2.03 MATERIALS NOT SPECIFIED
A. Painting Subcontractor shall designate type of paint to be used on each portion of the work not itemized above. Such material shall meet the Architect's approval.
B. Paint finish (gloss, flat, etc.) shall be verified with the Architect or Tenant's representative prior to painting on the job.
C. All graphic lines to be applied using "easy-mask" masking tape.
D. All cut lines to be true without overlaps or voids.
E. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

- 2.04 ACCESSORY MATERIALS
A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not, commercial quality.
B. Patching Material: Latex filler.
C. Fastener Head Cover Material: Latex filler.

2.05 PAINT SYSTEMS - INTERIOR

- A. Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, cast-in-place concrete, and plaster.
1. Sealed Concrete Walls:
a. Prime (Bare): (1) coat Seal-Krete Clear-n-Etch. If etching with muriatic acid, surface must be neutralized before proceeding.
b. Prime (painted): Freshly painted surfaces must be cured a minimum of 72 hours. Painted surfaces must not be peeling or blistering and cleaned with a water and trisodium phosphate (TSP) solution. Rinse well and allow to dry.
c. Finish: (1) coat Seal-Krete Clear-Seal - Satin (<100 gr VOC).
d. Locations: As indicated on the Drawings.
2. Latex Systems:
a. Flat Finish (Interior Concrete Walls):
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/isle.
(a) 8 mils wet, 3.2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/isle.
(a) 4 mils wet, 1.6 mils dry per coat.
3. Epoxy Systems, Water Based:
a. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/isle.
(a) 8 mils wet, 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46 Series: www.sherwin-williams.com/isle.
(a) 4 mils wet, 1.5 mils dry per coat.

- B. Metal: Aluminum and galvanized. (Includes Exposed Galvanized Ductwork; Shop Primed Metal Deck, Structural Steel Roof Framing, Joists, Bridging.)
1. Latex Systems:
a. Ep-Shel/Satin Finish High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/isle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Ep-Shel, B66-660 Series: www.sherwin-williams.com/isle.
(a) 2 to 4 mils dry per coat.
3) Conventional spray, HVLP or airless spray. Touch-ups shall be done with conventional spray or airless equipment or brush or roller.
C. Metal, Galvanized: Ceilings and ductwork.
1. Dryfall Waterborne Topcoats:
a. Semi-Gloss Finish:
1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-83 Series: www.sherwin-williams.com/isle.
b. Ep-Shel Finish:
1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-82 Series: www.sherwin-williams.com/isle.

- D. Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
1. Latex Systems:
a. Semi-Gloss High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/isle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/isle.
(a) 2 to 4 mils dry per coat.
E. Wood: Walls, ceilings, doors, and trim.
1. Interior Wood - Sealed:
a. 2 coats Minwax Water Based Oil-Modified Polyurethane.
2. Stain and Varnish System:
a. 1 coat stain PPG Olympic 44500 Interior Low VOC Oil Based Wood Stain (240 gr VOC)
b. 1 coats polyurethane satin: PPG Olympic 42786 Interior Waterbased Polyurethane Satin (<250 gr VOC)

- F. Drywall: Walls, ceilings, gypsum board, and similar items.
1. Latex Systems:
a. Ep-Shel Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28V2600: www.sherwin-williams.com/isle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Ep-Shel, B20-2600 Series: www.sherwin-williams.com/isle.
(a) 4 mils wet, 1.7 mils dry per coat.
2. Epoxy Systems, Water Based: (Gypsum Board Ceilings)
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28V2600: www.sherwin-williams.com/isle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series: www.sherwin-williams.com/isle.
(a) 5 mils wet, 2 mils dry per coat.
3. Electrical Room Mounting Boards, Fire Retardant Latex, 2 Coat. (Low VOC)
a. One to two coats as required for full coverage.

PART 3 EXECUTION

- 3.01 EXAMINATION
A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
C. Application of primers, paints, stains or finishes represents acceptance by the contractor that the surfaces were properly prepared and suitable for application.
D. Test shop-applied primer for compatibility with subsequent cover materials.
E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
4. Concrete Floors and Traffic Surfaces: 8 percent.
3.02 PREPARATION
A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.
D. Concrete:
1. Remove release agents, curing compounds, efflorescence, and chalk.
2. Fill bug holes, air pockets, and other voids with cement patching compound.
3. Prepare concrete in accordance with SSPC-SP 13/NACE No. 6.
E. Masonry: Remove efflorescence and chalk.
F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
G. Cementitious Siding: Remove dirt, dust and other foreign matter. Pressure clean, if needed, to remove grease, oil, and loose particles.
H. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.
I. Aluminum: Remove surface contamination and oil; wash with solvent according to SSPC-SP 1.
J. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2.
K. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No. 3. Protect from corrosion until coated.
L. Wood: Remove dust, grt, and foreign matter. Scrape, sand, and spot prime knots and pitch streaks. Fill nail holes and imperfections with wood filler and sand smooth.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
B. Apply products in accordance with manufacturer's written instructions.
C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.
D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.
E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
F. Apply each coat to uniform appearance.
G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
H. Apply paint, enamel, stain and varnish with suitable brushes, rollers or spraying equipment.
1. Rate of application shall not exceed that as recommended by paint manufacturer for the surface involved.
2. Keep brushes and rollers and spraying equipment clean, dry, free from contaminants and suitable for the finish required.
3. Apply stain by brush.
I. Finish coats shall be smooth, free of brush marks, streaks, laps or pile up of paints and skipped or missed areas.
J. Leave all parts of moldings and ornaments clean and true to details with no undue amount of paint in corners and depressions.
K. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
L. Change colors at corner of stop where colors differ between adjoining spaces or rooms and where door frames match wall colors.
M. Where portion of finish or drywall partition is damaged or unacceptable, refresh entire surface of partition.
N. Back-prime exterior carpentry and millwork with material specified for prime coat, without runs on face. Finish cut edges just prior to installation.
O. Finish all edges of exterior doors same as faces.

- P. The number of coats specified are minimum. The Contractor shall provide at no additional cost to the Owner, as many coats as necessary for color coverage conformity and uniform appearance.
1. As all exterior ferrous metal items, minimum 2.5 dry mils, 4.0 wet mils. Air spray application.
Q. Sand wood and metal surfaces lightly between coats to achieve required finish.
R. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 PRIMING

- A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
B. Clean surfaces immediately of overspray, splatter, and excess material.
C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

- A. Protect finished coatings from damage until completion of project.
B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 099000

DIVISION 10 - SPECIALTIES

SECTION 101423

PANEL SIGNAGE

PART 1 GENERAL

- 1.01 SECTION INCLUDES
A. Panel signage.

- 1.02 DEFINITIONS
A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities, Architectural Barriers Act (ABA) Accessibility Guidelines."

- 1.03 REFERENCE STANDARDS
A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.
C. Shop Drawings:
1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
b. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
c. Submit for approval by Owner through Architect prior to fabrication.
D. Manufacturer's qualification statement.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.

1.07 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Panel Signage:
1. Alienie Signs; Alien Marking Products, Inc.
2. Best Sign Systems Inc.
3. Mohawk Sign Systems, Inc: www.mohawksign.com/isle.
4. Substitutions: See Section 016000 - Product Requirements.

2.02 REGULATORY REQUIREMENTS

- A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.03 PANEL SIGNAGE

- A. Panel Signage:
1. Application: Room and door signs. Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner, complying with the following requirements:
2. Description: Flat signs with engraved panel media; tactile characters.
3. Sign Size: As indicated on drawings.
4. Total Thickness:
a. Aluminum Sheet: 0.080 inch thick.
b. Acrylic Sheet: 0.080 inch thick.
5. Sign Edges: Beveled.
6. Corners: Radiused.
7. Color and Font, unless otherwise indicated:
a. Character Font: Helvetica, Arial, or other sans serif font.
b. Character Case: Upper and lower case (title case).
c. Background Color: As indicated on the Drawings.
d. Character Color: Contrasting color.
8. Material: Laminated colored plastic engraved through face to expose core as background color.
9. Profile: Flat panel in aluminum frame.
a. Frame Finish: Black anodized.
10. Tactile Letters: Raised 1/32 inch minimum.
11. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with squared edges free from burrs and cut marks. Braille dots with domed or rounded shape.
12. Room Identification Signs: Provide minimum one sign per room. Size shall be 4" x 8", with (1) raised characters (1/32" minimum) at least 5/8" high and (2) raised numbers (1/32") at least 1" high numbers. Each sign shall also include a raised (1/32") Braille room identification.
13. Braille: Grade II, ADA-compliant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
B. Install with horizontal edges level.
C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
D. Protect from damage until mm-dd-yyyy; repair or replace damaged items.

END OF SECTION 101423

SECTION 102600

WALL AND DOOR PROTECTION

PART 1 GENERAL

- 1.01 SECTION INCLUDES
A. Corner guards.

- 1.02 REFERENCE STANDARDS
A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.
B. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2023.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
B. Protect work from moisture damage.
C. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.
D. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

1.04 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Install Warranty: Provide 5-year warranty for metal crash rails commencing on Date of Substantial Completion. Complete forms in Owner's name and register with installer.

PART 2 PRODUCTS

2.01 PERFORMANCE CRITERIA

- A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.

2.02 PRODUCT TYPES

- A. Corner Guards - Flush Mounted:
1. Material: Un-Anodized Aluminum (to match corner guards in hotel).
2. Width of Wings: 1/2 inches.
3. Corner: Square.
4. Color: As indicated.
5. Length: One piece.
6. Manufacturers:
a. Substitutions: See Section 016000 - Product Requirements.

2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

3.02 INSTALLATION

- A. Position corner guard 4 inches above finished floor to 96 inches high.

3.03 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.





**PART 1 - GENERAL REQUIREMENTS - HVAC, PLUMBING, AND FIRE PROTECTION**

**1.1 SUMMARY OF WORK**

- A. THE CONTRACTOR DOCUMENTS REQUIRE THE FURNISHING AND INSTALLING OF COMPLETE FUNCTIONING MECHANICAL SYSTEMS, AND EACH ELEMENT THEREOF, AS SPECIFIED OR INDICATED IN THE CONTRACT DOCUMENTS OR REASONABLY INFERRED, TO COMPLETELY AND LEAVE READY FOR OPERATION THE SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREIN DESCRIBED, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY, WHETHER OR NOT SPECIFICALLY CALLED FOR BY ITEM ELEMENTS OF THE WORK INCLUDE MATERIALS, LABOR, SUPERVISION, SUPPLIES, EQUIPMENT, TRANSPORTATION, AND UTILITIES.
- B. SPECIFICATIONS AND DRAWINGS ARE COMPLEMENTARY AND WHAT IS CALLED FOR IN ONE SHALL BE AS BINDING AS IF CALLED FOR BY BOTH.
- C. ALL WORK PERFORMED UNDER THIS SECTION SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER BY EXPERIENCED MECHANICS OF THE PROPER TRADE.

**1.2 COORDINATION, MEASUREMENTS AND LAYOUTS**

- A. THE CONTRACTOR SHALL INSPECT THE SITE WHERE THIS WORK IS TO BE PERFORMED AND FULLY FAMILIARIZE HIMSELF WITH ALL CONDITIONS RELATED TO THIS PROJECT.
- B. THE CONTRACTOR SHALL EMPLOY A COMPETENT FOREMAN ON THE JOB TO SEE THAT WORK IS DONE IN ACCORDANCE WITH THE BEST PRACTICES AND IN A SATISFACTORY AND WORKMANLIKE MANNER. THE FOREMAN SHALL KEEP INFORMED AS TO THE CONTRACTOR WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND SHALL EXECUTE HIS WORK IN SUCH A MANNER AS NOT TO INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.
- C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION, WHERE LOCAL CONDITIONS NECESSITATE A REARRANGEMENT, THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL DRAWINGS OF THE PROPOSED REARRANGEMENT, BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED, THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL, AND FINISH CONDITIONS AFFECTING ALL OF HIS WORK AND SHALL ARRANGE SUCH WORK ACCORDINGLY, FURNISHING SUCH OFFSETS, FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DRAWINGS SHALL NOT BE CALLED TO DETERMINE DIMENSION.

**1.3 PERMITS AND FEES**

- A. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND LICENSES AND SHALL MAKE ALL DEPOSITS AND PAY ALL FEES REQUIRED FOR THE PERFORMANCE OF WORK UNDER THIS SECTION, OTHER THAN THOSE DEPOSITS OR FEES WHICH ARE FULLY REFUNDABLE TO THE OWNER.

**1.4 SUBMITTALS, MATERIALS AND EQUIPMENT**

- A. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE SPECIFIED HEREIN, FREE FROM DEFECTS AND OF THE BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE.
- B. AS SOON AS POSSIBLE AFTER THE AWARD OF THE CONTRACT, THE CONTRACTOR SHALL SUBMIT FOR REVIEW SHOP DRAWINGS FOR ALL EQUIPMENT TO BE FURNISHED FOR THIS PROJECT. SUBMITTALS SHALL INCLUDE MANUFACTURER'S NAME, MODEL NUMBER, DESCRIPTION AND IN A SATISFACTORY MANNER. THE CONTRACTOR SHALL KEEP INFORMED AS TO THE CONTRACTOR WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND SHALL EXECUTE HIS WORK IN SUCH A MANNER AS NOT TO INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.
- C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION, WHERE LOCAL CONDITIONS NECESSITATE A REARRANGEMENT, THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL DRAWINGS OF THE PROPOSED REARRANGEMENT, BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED, THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL, AND FINISH CONDITIONS AFFECTING ALL OF HIS WORK AND SHALL ARRANGE SUCH WORK ACCORDINGLY, FURNISHING SUCH OFFSETS, FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DRAWINGS SHALL NOT BE CALLED TO DETERMINE DIMENSION.

**1.5 CODES, LAWS, AND STANDARDS**

- A. ALL WORK SHALL BE INSTALLED IN COMPLIANCE WITH ALL GOVERNING CODES, APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES OR STATUTES OF REGULATORY BODIES HAVING JURISDICTION, THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH SAID LAWS, REGULATIONS, ORDINANCES, STATUTES OR CODES, WITHOUT INCREASED COST TO THE OWNER. ANY POINT IN QUESTION SHALL BE REFERRED TO THE ENGINEER FOR APPROVAL. WORK INDICATED ON THE DOCUMENTS THAT IS IN EXCESS OF CODE REQUIREMENTS SHALL NOT BE REDUCED IN QUALITY AND/OR QUANTITY.
- B. COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMENTS AFFECTED BY CONNECTIONS OF SERVICES.

**1.6 RECORD DOCUMENTS**

- A. THIS CONTRACTOR SHALL PREPARE A COMPLETE "AS-BUILT" SET OF DRAWINGS INCORPORATING ALL CHANGES MADE DURING CONSTRUCTION, LOCATION OF UNDERGROUND PIPING SHALL BE LOCATED BY DIMENSION FROM COLUMN LINES.
- B. THIS CONTRACTOR SHALL PREPARE AND SUBMIT OPERATING AND MAINTENANCE MANUALS TO THE OWNER'S REPRESENTATIVE, INCLUDING FINAL COPIES OF EQUIPMENT SHOP DRAWINGS, MANUFACTURER'S LITERATURE FOR ALL EQUIPMENT INSTALLED ON THE PROJECT SHOWING ALL DETAILS OF EQUIPMENT, REPLACEMENT PART DATA AND MAINTENANCE AND OPERATING INSTRUCTIONS. MANUALS SHALL INCLUDE COPIES OF ALL EQUIPMENT WARRANTIES.

**1.7 GUARANTEES AND WARRANTIES**

- A. THE CONTRACTOR SHALL GUARANTEE COMPLETE SYSTEM OPERATION AND THAT THE MATERIAL AND EQUIPMENT FURNISHED AND INSTALLED WILL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS AND WILL GIVE SATISFACTORY SERVICE FOR A PERIOD OF 24 MONTHS. THE CONTRACTOR AGREES TO REPLACE, WITHOUT EXPENSE, ANY DEFECTIVE MATERIALS OR ACCESSORIES AFTER SUCH SHOP DRAWINGS ARE PROCESSED, AND REVIEWED, THEY WILL BE RETURNED TO THE CONTRACTOR WITH COMMENTS. THE CONTRACTOR SHALL, UPON RECEIPT OF REVIEWED SHOP DRAWINGS WITH ALL COMMENTS ADDRESSED, SHALL PROCEED WITH THE PROCUREMENT AND INSTALLATION OF SUCH EQUIPMENT.
- B. ALL WARRANTIES ISSUED BY EQUIPMENT MANUFACTURERS SHALL BE FILLED OUT IN THE OWNER'S NAME AND GIVEN TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF WORK PERFORMED UNDER THIS SECTION.

**1.8 FINAL INSPECTION**

- A. AFTER COMPLETION OF THE ENTIRE PROJECT THE CONTRACTOR SHALL REQUEST FINAL INSPECTION OF THIS PROJECT IN WRITTEN FORM ADDRESSED TO THE ARCHITECT ALONG WITH A STATEMENT TO THE EFFECT THAT ALL INSTALLATIONS HAVE BEEN COMPLETELY CHECKED, ADJUSTED AND BALANCED IN ACCORDANCE WITH REQUIREMENTS OF THIS PROJECT, UPON RECEIPT OF WRITTEN NOTIFICATION OF COMPLETION AND REQUEST FOR FINAL INSPECTION THE ENGINEER WILL PERFORM A FINAL INSPECTION OF THIS WORK AND, IF ALL INSTALLATIONS ARE AS REPRESENTED BY THE CONTRACTOR, THE ENGINEER WILL SUBMIT WRITTEN RECOMMENDATION OF ACCEPTANCE.

**1.9 CLEANING**

- A. DIRT AND DEBRIS RESULTING FROM THE PERFORMANCE OF THE WORK SHALL BE REMOVED TO KEEP THE PREMISES REASONABLY CLEAN AT ALL TIMES.
- B. AFTER COMPLETION OF THE WORK DESCRIBED IN THIS SPECIFICATION AND SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED SURFACES AND EQUIPMENT, REMOVE ALL DIRT, DEBRIS, CRATING, CARTONS, ETC., AND LEAVE ALL INSTALLATIONS FINISHED AND READY FOR OPERATION.

**1.10 OPENINGS AND SLEEVES**

- A. ALL PIPING THROUGH EXTERIOR OR FOUNDATION WALLS SHALL PASS THROUGH SCHEDULE 40 GALVANIZED STEEL SLEEVES WHICH SHALL BE LARGE ENOUGH TO ALLOW FOR PIPE SEAL MATERIAL. SLEEVES IN NEW CONSTRUCTION SHALL HAVE A MINIMUM 2 INCH WIDENING IN THE CENTER OF THE SLEEVE. NO SLEEVES ARE PERMITTED THROUGH CONCRETE STRUCTURAL MEMBERS.
  - 1. SPACE BETWEEN PIPE AND SLEEVE IN EXTERIOR UNDERGROUND WALLS SHALL BE SEALED WITH LINK-SEAL, FLEXICRAFT OR METRAFLEX LINK STYLE PIPE SEALS.
  - 2. IN ABOVE GRADE EXTERIOR WALLS PACK THE SPACE BETWEEN PIPE AND SLEEVE WITH MINERAL WOOL AND THEN COMPLETE SEAL WITH APPROVED CAULKING COMPOUND FLUSH WITH FINISHED SURFACE. PROVIDE PIPE COLLAR ON INTERIOR SIDE OF WALL.
- B. ALL PIPING THROUGH FLOORS SHALL BE PROVIDED WITH SCHEDULE 40 GALVANIZED STEEL PIPE SLEEVES, EXTENDING 1 INCH ABOVE THE FLOOR.
  - 1. IN FIRE RATED WALLS CAULKING SHALL BE A PURE CERAMIC PASTE MADE OF ALUMINA-SILICA, "CERAFIBER"FS" BY JOHNS-MANVILLE. SEALANT SHALL BE GUN GRADE. AN ACRYLIC 2-PART GUN APPLIED, FIRE RETARDANT ELASTIC SEALANT, "DYMERIC" BY TREMCO OR EQUAL BY PERMITTEE NO. 1113/F.
  - 2. LIMIT THE SIZE OF THE SPACE BETWEEN THE WALL OR FLOOR AND THE OUTSIDE OF THE PIPE OR DUCT TO 1/4 INCH MAXIMUM. THIS SPACE IS SUFFICIENT TO ALLOW SOME MOVEMENT OF THE PIPES OR DUCT WITHOUT CRACKING THE CAULKING OR SEALANT.
- C. FOR OPENINGS IN WALLS, THE CAULKING SHALL BE APPLIED TO A MINIMUM OF 3 INCH TOTAL DEPTH. SEALANT SHALL THEN BE APPLIED ON BOTH SIDES OF THE WALL, OPENING A MINIMUM OF 1/2 INCH IN DEPTH, FINISHED FLUSH WITH THE WALL. D.
- D. FOR OPENINGS IN FLOORS, THE CAULKING SHALL BE APPLIED FROM THE UPPER SIDE TO A MINIMUM OF 3 INCH TOTAL DEPTH REFINISHED 1/2 INCH ABOVE THE FINISHED FLOOR. THIS 1/2 INCH RECESS SHALL THEN BE FILLED WITH SEALANT TO FLUSH WITH FINISHED FLOOR.

**1.11 CUTTING AND PATCHING**

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING OF WALLS, FLOORS, CEILINGS AND ROOFS REQUIRED FOR PERFORMANCE OF HIS WORK.
- B. NO STRUCTURAL MEMBER SHALL BE CUT WITHOUT PERMISSION FROM THE ARCHITECT.
- C. PATCH ALL OPENINGS TO MATCH ADJACENT CONSTRUCTION IN BOTH MATERIAL AND FINISH.
- D. ALL CUTTING OF EXISTING CONCRETE FLOORS/SLABS ON GRADE IN THE INTERIOR OF THE BUILDING SHALL BE PERFORMED BY "SAW CUTTING" AND SHALL BE PERFORMED BY THIS CONTRACTOR.

**1.12 EXCAVATION AND BACKFILL**

- A. ALL EXCAVATION AND BACKFILL REQUIRED FOR THE INSTALLATION OF THE WORK SHALL BE THE COMPLETE RESPONSIBILITY OF THE CONTRACTOR.
- B. NO EXCAVATION AND BACKFILL SHALL BE DONE WITH DRAIN LINE OF TREES TO REMAIN, NO TREE SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE OWNER'S REPRESENTATIVE.
- C. CONTRACTOR SHALL PROVIDE PROTECTION FOR TREES WITHIN 15 FEET OF UTILITY EXCAVATION.
- D. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL TRENCH AREAS AND MAINTAINING A DRY EXCAVATION, ANY DEWATERING OF TRENCHES/EXCAVATION SHALL BE PROVIDED PRIOR TO INSTALLING ANY MATERIAL.
- E. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ALL NECESSARY BARRICADES, FENCING, BRACING, SHEET PILING, SHORING, WARNING SIGNS, PUMPS, ETC., FOR THE PROTECTION OF WORKERS, GENERAL PUBLIC, AND PROPERTIES. EXCAVATION WORK SHALL CONFORM TO ALL APPLICABLE CODES FOR BUILDING CONSTRUCTION AND ACCORDING TO STANDARD MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" AND THE DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH (OSHA) STANDARDS.
- F. LOCATE EXISTING UNDERGROUND UTILITIES IN AREAS OF EXCAVATION WORK, SHOULD UNCHARTED, OR INCORRECTLY CHARTED, PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS.
- G. ALL TRENCHES SHALL BE UNIFORMLY GRADED AND BE FREE OF SOFT SPOTS AND STONE. PROVIDE A 4 INCH SAND BED.
- H. BACKFILL SHALL NOT BEGIN UNTIL INSTALLATION HAS BEEN TESTED AND INSPECTED. CONTRACTOR SHALL CONSULT WITH THE AUTHORITY HAVING JURISDICTION AND THE ARCHITECT/ENGINEER PRIOR TO BACKFILLING.
  - 1. INITIAL BACKFILL SHALL BE SAND TO A POINT 6 INCHES ABOVE TOP OF INSTALLED WORK.
  - 2. FINAL BACKFILL SHALL BE INSTALLED IN LAYERS NOT EXCEEDING 12 INCHES. FILL SHALL BE WELL TAMPED BEFORE ADDITIONAL BACKFILL MATERIAL IS PLACED. BACKFILL SHALL CONSIST OF EARTH OR SAND FREE OF STONE, BRICKS, OR FOREIGN MATTER.
- I. ALL EXCESS EARTH AND OTHER MATERIAL RESULTING FROM THE EXCAVATION SHALL BE REMOVED FROM SITE BY THE CONTRACTOR OR MAY BE FILED AT A LOCATION DESIGNATED AND APPROVED BY THE OWNER. ALL DEBRIS, ROCK AND TRASH SHALL NOT BE ALLOWED TO ACCUMULATE AND SHALL BE REMOVED FROM THE SITE. STREETS, ROADWAYS AND PRIVATE PROPERTY SHALL BE KEPT IN A CLEAN CONDITION.
- J. WHEN THE EXCAVATION IS WITHIN THE AREA WHERE FINISHED SITE WORK IS TO BE DONE UNDER THE GENERAL CONTRACT WORK, BACKFILL TO THE HEIGHT OF ROUGH GRADE. FINAL SURFACING WILL BE UNDER GENERAL CONTRACT WORK.
- K. WHEN THE EXCAVATION IS BEYOND THE AREA OF GENERAL CONSTRUCTION WORK, FINAL SURFACE AND ADJACENT DISTURBED AREAS SHALL BE RESTORED TO MATCH THE ORIGINAL CONDITION BY SOODING, SEEDING, ASPHALT PAVING, CONCRETE, ETC., AS REQUIRED. WORK SHALL CONFORM TO APPLICABLE SECTIONS OF THESE SPECIFICATIONS.
- L. WHEN THE EXCAVATION IS ON PUBLIC PROPERTY, RESTORATION OF SURFACE CONDITIONS SHALL MEET THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

WHEN SERVICES ARE TO BE RUN SIDE-BY-SIDE, A COMMON TRENCH MAY BE USED PROVIDING THE REQUIRED VERTICAL AND HORIZONTAL SEPARATION BETWEEN THE VARIOUS SERVICES ARE MAINTAINED AND PROVIDING THE METHODS OF BEDDING AND BACKFILL MEET THE APPROVAL OF THE ENGINEER. CONTRACTORS INVOLVED SHALL MAKE THEIR OWN AGREEMENT AS TO THE SHARING OF THE COST OF THE COMMON TRENCHING AND BACKFILL WORK.

**1.13 TEMPORARY HEAT**

A. THE CONTRACTOR SHALL COOPERATE WITH THE GENERAL CONTRACTOR TO PROVIDE TEMPORARY HEAT AS SOON AS POSSIBLE TO MEET THE APPROVAL OF THE ENGINEER. HEATING CONSTRUCTION IF TEMPORARY HEAT IS REQUIRED. AIR HANDLING EQUIPMENT SHALL NOT BE OPERATED AT ANY TIME WITHOUT FILTERS IN PLACE AND ALL EQUIPMENT SHALL BE PROTECTED FROM DAMAGE. OPERATING THE EQUIPMENT FOR TEMPORARY HEAT SHALL NOT START THE WARRANTY PERIOD OF THE EQUIPMENT USED.

**1.14 DEMOLITION AND NEW WORK**

- A. THE CONTRACTOR SHALL DO ALL DEMOLITION, ALTERATIONS AND REWORK INDICATED AND/OR REQUIRED TO MAINTAIN THE OPERATION OF ALL EXISTING HVAC SYSTEMS AND TO INTEGRATE THE NEW SYSTEMS IN THE RENOVATED BUILDING AS REQUIRED. THE CONTRACTOR SHALL INCLUDE ALL WORK WHICH MAY BE REQUIRED TO ALTERATIONS AND DEMOLITION WORK. THIS SHALL INCLUDE ALL REMOVAL, RELOCATION AND REWORKING OF PIPING, ITEMS OF HVAC EQUIPMENT, ETC. EXISTING SYSTEMS AND NEW SYSTEMS SHALL BE COMPLETELY INTEGRATED AS INTENDED AND AS INDICATED ON THE PLANS AND IN THE SPECIFICATIONS.
- B. THE CONTRACTOR SHALL REMOVE FROM THE PREMISES AND DISPOSE OF PROPERLY ALL EXISTING MATERIAL AND EQUIPMENT WHICH NO LONGER SERVES A PURPOSE IN ALTERED AREAS. THE CONTRACTOR SHALL REMOVE UNUSED DUCTWORK AND EQUIPMENT CONNECTED TO EQUIPMENT TO BE REMOVED. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL MAINTAIN SERVICES TO ALL EXISTING AREAS REQUIRING SUCH SERVICES. THE CONTRACTOR SHALL REROUTE AS REQUIRED SUCH SERVICES WHERE ARE DISRUPTED DUE TO ARCHITECTURAL CHANGES IN THE EXISTING STRUCTURE. ANY EQUIPMENT WHICH IS DESIGNATED TO BE REUSED AND WHICH IS DAMAGED IN THE PROCESS SHALL BE REPLACED BY THE CONTRACTOR WITH NEW EQUIPMENT OF LIKE KIND AT NO COST TO THE OWNER.

**1.15 INTERRUPTION OF SERVICES**

A. THE CONTRACTOR SHALL SCHEDULE ANY SERVICE INTERRUPTIONS TO THE EXISTING BUILDING WITH THE OWNER'S REPRESENTATIVE. SUCH INTERRUPTIONS SHALL BE PLANNED SO AS TO BE AT TIMES TO CAUSE THE LEAST INCONVENIENCE AND INTERRUPTION TO THE FACILITY'S SCHEDULE.

**1.16 EXISTING CONDITIONS**

ALL EXISTING CONDITIONS SHOWN ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS FOR THIS PROJECT HAVE BEEN DETERMINED FROM AVAILABLE DRAWINGS AND FIELD INVESTIGATIONS. CONTRACTORS MAKING PROPOSALS FOR THIS WORK SHALL VERIFY ALL EXISTING CONDITIONS AND BASE THEIR PROPOSALS ON THEIR OBSERVATIONS TO PROVIDE COMPLETE AND FUNCTIONING INSTALLATIONS IN ACCORDANCE WITH THE INTENT OF THE DRAWING AND SPECIFICATIONS FOR THIS PROJECT AND ALL APPLICABLE GOVERNING CODES, RULES, REGULATIONS AND ORDINANCES. FAILURE TO DETERMINE EXISTING CONDITIONS WHICH CAUSE ADDITIONAL WORK WILL NOT CONSTITUTE GROUNDS FOR ADDITIONAL COMPENSATION.

**PART 2 - HEATING, VENTILATING AND AIR CONDITIONING**

**2.1 GENERAL REQUIREMENTS**

A. SEE PART 1 FOR GENERAL REQUIREMENTS.

**2.2 BELT DRIVES AND GUARDS**

- A. ALL BELT DRIVES SHALL BE OF THE MULTIPLE "V" TYPE, DAYTON, GATES OR OTHER STANDARD SLIDE RAILS OR OTHER MEANS OF BELT ADJUSTMENT SHALL BE PROVIDED FOR EACH MOTOR USED WITH A BELT DRIVE.
- B. REMOVABLE STEEL GUARDS WITH EXPANDED METAL SCREENS OF ACCEPTABLE DESIGN SHALL BE PROVIDED OVER ALL EXPOSED BELT DRIVES AND COUPLINGS.

**2.3 FILTERS**

- A. THE CONTRACTOR SHALL ONLY RUN ALL AIR HANDLING UNITS IN THE BUILDING DURING THE TESTING PERIOD PRIOR TO COMPLETION OF THE WORK. UNITS SHALL NOT BE RUN WITHOUT FILTERS IN PLACE.
- B. FILTERS SHALL BE AS MANUFACTURED BY AMERICAN AIR FILTER, CAMFIL FARR OR CAMBRIDGE.

**2.4 FLEXIBLE CONNECTORS**

- A. THE CONTRACTOR SHALL INSTALL FLEXIBLE DUCT CONNECTIONS BETWEEN EACH PIECE OF EQUIPMENT HAVING A FAN, AND ITS OUTLET AND RETURN. SUPPLY AND RETURN DUCTS WHICH, WHEN COMPLETED SHALL BE AIRTIGHT.
- B. CONNECTORS SHALL PROVIDE A MINIMUM OF 2 INCHES BETWEEN METAL TO INSURE AGAINST TRANSMISSION OF VIBRATION FROM THE FAN UNIT TO THE DUCTWORK.

**2.5 MOTORS AND STARTERS**

- A. ALL ELECTRIC MOTORS SHALL BE PREMIUM EFFICIENCY AND FURNISHED FOR OPERATION ON ELECTRICAL SERVICES AS DESIGNATED ON THE DRAWINGS AND RETURN TORQUE CHARACTERISTICS SUITABLE FOR THE EQUIPMENT SERVED. ANY CHANGES TO THE ELECTRICAL WIRING DUE TO EQUIPMENT BEING FURNISHED, OTHER THAN THAT SPECIFIED, IS THE RESPONSIBILITY OF THE CONTRACTOR.
- B. ACROSS-THE-LINE MANUAL STARTERS AND MAGNETIC STARTERS SHALL BE COUNTER-HAMMER PRODUCTS OR APPROVED EQUAL, UNLESS OTHERWISE SPECIFIED, OF SIZES REQUIRED FOR THE MOTOR HORSEPOWER AND PHASE SERVED. STARTERS LOCATED IN EQUIPMENT AREAS AND UNFINISHED SPACES MAY BE SURFACE MOUNTED TYPES WITH FUNCTIONS IDENTIFIED BY ENGRAVED PLASTIC PLATES.
- C. THE MECHANICAL CONTRACTOR SHALL FURNISH TO THE ELECTRICAL CONTRACTOR ALL STARTERS AND STARTER OVERLOADS, ALL NECESSARY WIRING DIAGRAMS AND INSTRUCTIONS TO FACILITATE THE INSTALLATION OF POWER AND CONTROL WIRING TO ALL EQUIPMENT.

**2.6 SHEET METAL DUCTWORK**

- A. SHEET METAL DUCTS AND CONNECTIONS SHALL BE CONSTRUCTED OF 60 GALVANIZED SHEETS OF MILD STEEL. THE DUCTS SHALL BE CONSTRUCTED TO THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) 2" W.G. PRESSURE CLASS STANDARDS. NO DUCT SHALL BE CONSTRUCTED WITH LESS THAN 24 GAUGE METAL. LOCAL CODES REQUIRING HEAVIER GAUGES SHALL GOVERN. ALL DUCTS SHALL BE SEALED TO SMACNA "B" CLASSIFICATION.
- B. DUCT SECTIONS SHALL BE JOINED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION AND REQUIREMENTS OF THE BUILDING CODE HAVING JURISDICTION.
- C. DUCT DIMENSIONS SHOWN ARE SHEET METAL DIMENSIONS AND DO NOT NEED TO BE ADJUSTED FOR INSULATION LINING.
- D. CURVED ELBOWS SHALL BE CONSTRUCTED WITH INSIDE RADIUS NOT LESS THAN THE DUCT WIDTH IN THE SAME PLANE. SQUARE ELBOWS SHALL HAVE TURNING VANES. TURNING VANES SHALL BE DESIGNED IN ACCORDANCE WITH ASHRAE RECOMMENDATIONS. MANUFACTURED VANES SHALL BE BY TITUS OR APPROVED EQUAL.
- E. CROSSBREAK ALL DUCTWORK SURFACES OVER 18 INCHES IN WIDTH.
- F. FULL AREAS SHALL BE MAINTAINED IN TRANSITIONS WHERE A CHANGE IN THE CONFIGURATION OF THE DUCT OCCURS. ALL TAPERING JOINTS SHALL BE REDUCED GRADUALLY.
- G. JOINTS IN DUCTS SHALL BE MADE PRACTICALLY AIRTIGHT AND ANY OPEN CORNER SHALL BE NEATLY PATCHED AND SOLDERED TIGHT. DUCT TAPE WILL NOT BE ACCEPTED AS A JOINT PATCH. LOW PRESSURE SYSTEM DUCT LEAKAGE SHALL NOT EXCEED 2%.

**2.7 CONCEALED ROUND DUCTS SHALL BE CONSTRUCTED TO SMACNA 2" W.G. STANDARDS WITH GROOVED LONGITUDINAL JOINTS AND SLEEVED TYPE TRANSVERSE JOINTS.**

- I. EXPOSED ROUND DUCTS SHALL BE CONSTRUCTED TO SMACNA 10" W.G. STANDARDS, SPIRAL LOCK SEAM DUCT AND FITTINGS.
- J. REFER TO DUCTWORK SCHEDULE ON DRAWINGS FOR ADDITIONAL PROJECT REQUIREMENTS.

**2.7 DUCT LINER**

- A. DUCTWORK LINER SHALL 1/2" BE 2 LB. DENSITY UNLESS NOTED OTHERWISE ON DRAWINGS. PRODUCT SHALL BE CERTAINTED TOUGH DUCT LINER OR EQUAL. MANVILLE, KNAUF INSULATION, OR OWENS CORNING UNLESS NOTED OTHERWISE ON THE DRAWINGS. ALL DUCT LINER IS TO COMPLY AND BE INSTALLED IN ACCORDANCE TO NAIMA FIBROUS GLASS DUCT LINER STANDARD AND SMACNA.
- B. REFER TO DUCTWORK SCHEDULE ON DRAWINGS FOR ADDITIONAL PROJECT REQUIREMENTS.

**2.8 FLEXIBLE DUCT**

- A. FLEXIBLE DUCTS SHALL BE UL-181 CLASS THERMAFLEX M-KE, OR APPROVED EQUAL, SHALL NOT BE LONGER THAN 8 FEET AND SHALL NOT HAVE ANY AIR FLOW OBSTRUCTION.

**2.9 DUCTWORK SUPPORTS**

- A. ALL HORIZONTAL DUCTS SHALL BE SUPPORTED WITH HANGERS SPACED NOT MORE THAN 8'-0" APART. HANGERS FOR DUCTS SMALLER THAN 31 INCHES SHALL CONSIST OF 22 GAUGE GALVANIZED STEEL STRAPS SECURELY FASTENED TO THE DUCT AND TO THE BUILDING STRUCTURE. HANGERS FOR DUCTS OVER 31 INCHES IN WIDTH SHALL BE HUNG WITH 1/4 INCH STEEL ANGLE ON THE BOTTOM OF THE DUCT SUPPORTED WITH STEEL RODS OF APPROPRIATE SIZE SECURELY FASTENED TO THE BUILDING STRUCTURE. ALL SUPPORTS TO MEET SMACNA STANDARDS.

**2.10 DUCTWORK INSULATION**

- A. CONCEALED ROUND DUCTWORK AND UNLINED RECTANGULAR DUCTWORK SHALL BE INSULATED.
- B. DUCT WRAP INSULATION SHALL BE, 1-1/2" THICK CERTAIN-TEED DUCT WRAP INSULATION FACED ON ONE SIDE WITH .002 INCH ALUMINUM FOIL WITH A 2 INCH TAB, OR EQUAL PRODUCTS BY MANVILLE, KNAUF INSULATION, OR OWENS CORNING UNLESS NOTED OTHERWISE ON THE DRAWINGS. INSULATION SHALL BE APPLIED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- C. ALL INSULATION SHALL BE UL LISTED, FLAME SPREAD/FUEL CONTRIBUTED/SMOKE DEVELOPED RATING OF 25/50/50 OR LESS IN ACCORDANCE WITH ASTM E84, NFPA 255 AND UL 723.
- D. REFER TO DUCTWORK INSULATION SCHEDULE ON DRAWINGS FOR ADDITIONAL PROJECT REQUIREMENTS.

**2.11 GRILLES, REGISTERS, DIFFUSERS AND LOUVERS**

- A. FURNISH AND INSTALL ALL GRILLES, REGISTERS, DIFFUSERS AND LOUVERS AS SHOWN AND DESCRIBED ON THE DRAWINGS OR COMPARABLE PRODUCTS OF TITUS, PRICE, OR APPROVED EQUAL.
- B. THE CONTRACTOR SHALL INFORM THE GENERAL CONTRACTOR OF THE REQUIREMENTS FOR OPENING SIZES AND FRAMING FOR ALL EQUIPMENT AND SHALL COORDINATE THE INSTALLATION OF ALL SUCH EQUIPMENT WITH THE STRUCTURAL REQUIREMENTS OF THIS PROJECT.

**2.12 OPERATING AND MAINTENANCE MANUALS**

A. THE EQUIPMENT MANUFACTURER SHALL FURNISH THE OWNER TWO BOUND SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL SYSTEMS.

**2.13 START-UP/TESTING, ADJUSTING, BALANCING**

- A. THE CONTRACTOR SHALL COMPLETE ALL EQUIPMENT INSTALLATIONS, CHECK ALL CONTROL WIRING, START UP AND ADJUST ALL EQUIPMENT AND PLACE ALL SYSTEMS IN OPERATION.
- B. AFTER COMPLETION AND START-UP OF ALL SYSTEMS THE CONTRACTOR SHALL ARRANGE FOR TESTING, ADJUSTING AND BALANCING OF ALL AIR SYSTEMS.
- C. TESTING, ADJUSTING AND BALANCING OF ALL AIR SYSTEMS SHALL BE PERFORMED IN COMPLETE ACCORDANCE WITH NEBB OR SMACNA STANDARDS.
- D. UPON COMPLETION OF TESTING, ADJUSTING AND BALANCING, A COMPLETE REPORT OF ALL FINDINGS SHALL BE SUBMITTED TO THE ENGINEER WITHIN 90 DAYS OF THE CERTIFICATE OF OCCUPANCY AND PRIOR TO FINAL ACCEPTANCE OF THIS PROJECT.

**2.14 CURBS**

- A. CURBS FOR EXHAUSTERS AND DUCTWORK THROUGH ROOF SHALL BE PATE TYPE PC AS REQUIRED BY ROOF CONSTRUCTION, OR COMPARABLE THYBURC PRODUCTS OF THE THYBAR CORP. ALL CURBS AND SUPPORTS SHALL BE CONSTRUCTED AS REQUIRED TO COMPENSATE FOR SLOPES OF THE ROOF STRUCTURE TO PROVIDE LEVEL SUPPORT OF EQUIPMENT. CURB HEIGHTS AT THE HIGH POINTS OF THE BUILDING STRUCTURE SHALL NOT BE LESS THAN 14 INCHES.
- B. CURBS FOR ROOF MOUNTED HEATING, VENTILATING AND AIR CONDITIONING UNITS SHALL BE PROVIDED BY THE EQUIPMENT MANUFACTURER AND SHALL BE DESIGNED TO COMPENSATE FOR SLOPES OF STRUCTURAL STEEL TO PROVIDE LEVEL SUPPORT OF EQUIPMENT. CURBS SHALL BE INSULATED TYPE WITH 1-1/2 INCH THICK INSULATION AND A MINIMUM DENSITY OF 3 POUNDS.

**2.15 DAMPERS**

- A. VOLUME BALANCING DAMPERS SHALL BE RUSKIN CD-36/CDR-25 OR APPROVED EQUAL. THE DAMPERS SHALL BE CONSTRUCTED OF 16 GAUGE GALVANIZED STEEL, 6 INCH WIDE CONCEALED BLADES AND THE LINKAGE CONCEALED IN FRAME.
- B. FIRE DAMPERS SHALL BE PROVIDED WHERE SHOWN ON THE DRAWINGS AND ELSEWHERE AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND SHALL BE RUSKIN TYPE IBD2, STYLE B, OR COMPARABLE PRODUCTS OF VENT PRODUCTS COMPANY, INC., CURTAIN TYPE HAVING 100% FIRE AREA WITH 212 DEGREES F. FUSIBLE LINK, DYNAMICALLY RATED WITH HOUR RATING TO MATCH WALL RATING APPLICATION UNLESS OTHERWISE NOTED. ACCESS PANELS SHALL BE PROVIDED IN DUCTS AND IN THE STRUCTURE FOR ALL FIRE DAMPERS. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S STANDARDS.
- C. FIRE/SMOKE AND DAMPERS SHALL BE PROVIDED WHERE SHOWN ON THE DRAWINGS AND ELSEWHERE AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND SHALL BE RUSKIN OR APPROVED EQUAL. DAMPER SHALL HAVE RATING TO MATCH WALL RATING APPLICATION UNLESS OTHERWISE NOTED. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S STANDARDS.
- D. EXHAUST FANS SHALL BE AS SHOWN ON THE DRAWINGS OR COMPARABLE PRODUCTS OF GREENHECK, COOK, CARNES, OR APPROVED EQUAL.
- E. EACH EXHAUSTER SHALL BE PROVIDED WITH A DISCONNECT SWITCH, BACKDRAFT DAMPER AND BIRDSCREEN.
- F. ROOF MOUNTED EXHAUST FANS SHALL BE PROVIDED WITH CURBS AS DESCRIBED ABOVE.
- G. IN-LINE EXHAUST FANS SHALL BE MOUNTED WITH RIS ISOLATORS.
- H. REFER TO PARAGRAPH TITLED "CURBS" IN THIS SECTION OF THE SPECIFICATION.
- I. REFER TO THE EQUIPMENT SCHEDULE ON THE DRAWINGS FOR CAPACITIES AND ADDITIONAL REQUIREMENTS.

**2.17 REFRIGERANT PIPING**

- A. REFRIGERANT PIPING SHALL BE TYPE K COPPER, ACR WITH WROUGHT COPPER FITTINGS AND SILVER SOLDER OR BRAZED JOINTS.
- B. REFRIGERANT LIQUID PIPE HANGERS SHALL BE ANVIL #C765 COPPER PLATED CARBON STEEL ADJUSTABLE SWIVEL RING HANGERS.
- C. REFRIGERANT SUCTION PIPE HANGERS SHALL BE ANVIL #260 ADJUSTABLE CLEVIS HANGER WITH SHIELD.
- D. SPACING FOR REFRIGERANT PIPING HANGERS AND SUPPORTS SHALL BE:
  - 1. 6 FEET ON CENTER FOR PIPING 1-1/4" AND SMALLER.
  - 2. 10 FEET ON CENTER FOR PIPING 1-1/2" AND LARGER.
- E. INSULATION FOR REFRIGERANT SUCTION LINES SHALL BE ARMAFLEX AP OR EQUAL, CLOSED CELL FLEXIBLE FOAM INSULATION, 1" THICK WITH SEAL STRIP. PROVIDE GALVANIZED PIPE SHIELD AT HANGER LOCATIONS.

**2.18 PAINTING: (SEE ARCHITECTURAL SECTION "PAINTING")**

- A. PAINTING, EXCEPT AS SPECIFIED HEREIN, SHALL BE DONE BY OTHERS.
- B. EQUIPMENT WHICH HAS DAMAGED FINISH SHALL BE REPAINTED TO MATCH THE ORIGINAL FACTORY FINISH.
- C. ALL EXPOSED FERROUS METAL FURNISHED UNDER THIS CONTRACT, SUCH AS HANGERS, STRUTS, STRUCTURAL STEEL, ETC., SHALL BE GIVEN ONE COAT OF TNEMC GRAY PRIMER.

**PART 3 - PLUMBING**

**3.1 GENERAL REQUIREMENTS**

A. SEE PART 1 FOR GENERAL REQUIREMENTS.

**3.2 TRAPS**

- A. ALL FLOOR DRAINS AND FIXTURES WITH WASTE CONNECTIONS SHALL BE SEPARATELY TRAPPED WITH A WATER SEALED TRAP PLACED AS CLOSE TO THE FIXTURE OR DRAIN AS POSSIBLE. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TRAPS REQUIRED INCLUDING TRAPS NOT FURNISHED IN COMBINATION WITH FIXTURES AND EQUIPMENT. ALL EXPOSED TRAPS IN FINISHED SPACES SHALL BE CHROMIUM PLATED BRASS. PROVIDE DEEP SEAL TRAPS AND RUNNING TRAPS WHERE REQUIRED.
- B. IN LIEU OF DEEP SEAT TRAPS, FLOOR DRAINS CAN BE PROVIDED WITH PROSET SYSTEMS TRAP GUARD OR EQUAL.

**3.3 PIPING INSTALLATION**

- A. ENDS OF PIPE SHALL BE REAMED AND ALL BURRS REMOVED BEFORE INSTALLATION. PIPING SHALL BE CUT ACCURATELY TO MEASUREMENTS TAKEN ON THE JOB AND SHALL BE INSTALLED WITH AMPLE CLEARANCE FOR INSTALLATION OF COVERINGS.
- B. PIPING PASSING THROUGH WALLS OR FLOOR SHALL BE RUN FREE, USING PIPE SLEEVES AND SHALL NOT BE GROUDED IN PLACE. SLEEVES FOR PIPING TO BE INSULATED SHALL BE SIZED TO ALLOW FOR INSULATION THICKNESS. PIPING SHALL BE INSTALLED CONCEALED IN FINISHED ROOMS AND WHEREVER POSSIBLE, EXPOSED PIPES, WHERE PASSING THROUGH FLOORS, FINISHED WALL, OR FINISHED CEILINGS SHALL BE FITTED WITH CHROMIUM PLATED ESCUTCHEON PLATES. PLATES SHALL BE LARGE ENOUGH TO COVER THE JOINTS AROUND THE PIPES AND SHALL BE ROUND, NOT LESS THAN 1-1/2" LARGER THAN THE DIAMETER OF THE PIPE. PLATES SHALL BE SECURELY FASTENED IN PLACE.
- C. AT LEAST ONE PIPE UNION SHALL BE INSTALLED ADJACENT TO ALL VALVES THAT ARE SCREWED, HOT AND COLD SUPPLIES TO EACH FIXTURE AND WATER HEATER SHALL BE VALVED SEPARATELY AT THE FIXTURE. ALL SUPPLY PIPES TERMINATING AT VALVES OR FIXTURES SHALL BE PROVIDED WITH A WATER HAMMER ARRESTOR OF SUFFICIENT CAPACITY TO PREVENT WATER HAMMER.
- D. ALL HOT AND COLD WATER BRANCH LINES SHALL BE VALVED IN AN ACCESSIBLE LOCATION.
- E. ALL HOT AND COLD WATER PIPING SHALL BE ARRANGED TO DRAIN THE LOWEST POINT AND DRAIN VALVES WITH HOSE THREADS SHALL BE PROVIDED SO THAT THE ENTIRE SYSTEM CAN BE EMPTIED.

**3.4 PIPING JOINTS**

- A. THREADED JOINTS SHALL BE MADE UP TIGHT WITH GRAP AND CLEAN, WITH NOT MORE THAN THREE THREADS EXPOSED BEYOND FITTINGS. JOINTS SHALL BE MADE UP TIGHT WITH FLARE AND CLEAN. PIPE JOINT COMPOUND APPLIED TO MALE THREADS ONLY. EXPOSED THREADS OF FERROUS PIPE SHALL BE PAINTED WITH ACID-RESISTING PAINT AFTER PIPING HAS BEEN TESTED AND PROVEN TIGHT. NO CAULKING, LAMP WICK OR OTHER MATERIAL WILL BE ALLOWED FOR CORRECTION OF DEFECTIVE JOINTS.
- B. SWEAT OR SOLDERED JOINTS IN COPPER WATER PIPING SHALL BE MADE BY THE APPROPRIATE USE OF APPROVED BRASS WATER FITTINGS PROPERLY SWEATED OR SOLDERED TOGETHER, FLARED JOINTS WHERE SPECIFIED FOR SOFT COPPER TUBING SHALL BE MADE WITH FITTINGS MEETING APPROVED STANDARDS. SURFACES TO BE SOLDERED OR SWEAT SHALL BE CLEANED BRIGHT, PROPERLY FLUXED WITH APPROVED NONCORROSIVE PASTE TYPE FLUX AND MADE WITH #55 OR #46 SOLDER. THE USE OF SELF-CLEANING FLUXES, 50-50 SOLDER OR PASTE TYPE SOLDER IS PROHIBITED. FLARED JOINTS SHALL BE MADE BY EXPANDING THE TUBE WITH A PROPER FLARING TOOL. ALL TUBES SHALL BE PROPERLY REAMED.
- C. JOINTS IN BELL AND SPIGOT CAST IRON SOIL PIPE SHALL BE OF SOFT NO LEAD AND OAKUM WITH LEAD NOT LESS THAN 1" DEEP, AND INSTALLED IN ONE POUR OR TYLER TY-SEAL GASKETS UNDERGROUND ONLY.
- D. JOINTS FOR NO-HUB PIPE SHALL BE NEOPRENE WITH STAINLESS STEEL BANDS.
- E. JOINTS FOR PLASTIC PIPE, WHEN PERMITTED, SHALL BE SOLVENT WELDED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS.

**3.5 DOMESTIC HOT AND COLD WATER PIPING**

- A. ALL DOMESTIC HOT AND COLD WATER PIPING WITHIN THE BUILDING SHALL BE COPPER. UNDERGROUND WATER SERVICE OUTSIDE OF THE BUILDING MAY BE TYPE "K" SOFT TEMPER COPPER OR DUCTILE IRON OR CAST IRON PIPE WITH SUPER BELL-TITE, MECHANICAL OR FLANGED JOINTS.
- B. COPPER PIPING INSTALLED UNDERGROUND SHALL BE SOFT TEMPER TYPE "K" AND INSTALLED WITHOUT JOINTS.
- C. ALL OTHER COPPER PIPING SHALL BE HARD TEMPER TYPE "L". ALL COPPER PIPING SHALL CONFORM TO ASTM-B-88 REQUIREMENTS. SERVICE PIPING OF CAST IRON OF DUCTILE IRON PIPE SHALL COMPLY WITH UNSI, AWWA AND FEDERAL SPECIFICATIONS.
- D. FITTINGS FOR USE WITH TYPE "K" AND "L" COPPER PIPING SHALL BE WROUGHT COPPER SOLDER-JOINT. UNIONS SHALL BE GROUND JOINT TYPE AND SHALL BE INSTALLED WHERE NECESSARY TO PROVIDE ACCESS TO THE PIPING SYSTEM. PRESS FITTINGS FOR COPPER WATER PIPING ARE ACCEPTABLE WHERE PERMITTED BY GOVERNING CODES.
- E. WHEN A CONNECTION BETWEEN COPPER PIPE AND FERROUS PIPE IS NECESSARY, SAE CONNECTION SHALL BE MADE BY USING BRASS CONVERTER FITTING.
- F. DRAINS INDICATED ON THE DRAWINGS AND AT LOW POINTS IN CONNECTION WITH THE HOT AND COLD WATER DISTRIBUTION SYSTEM SHALL CONSIST OF 1/2" FAUCET WITH HOSE THREADS. DRAINS SHALL BE INSTALLED AT LOW POINTS IN THE HOT AND COLD WATER PIPING AND ALL PIPING SHALL GRADE TO DRAIN.
- G. REFER TO PIPING SCHEDULE ON DRAWINGS FOR ADDITIONAL PROJECT REQUIREMENTS.

**3.6 VALVES FOR DOMESTIC WATER**

- A. FOR PIPING 1/2" - 2", MILWAUKEE BA-150 BALL VALVE, BRONZE, TEFLON SEATS AND PACKING, 400 LBS W.O.G., SOLDER OR PRESSURE SEAL ENDS.
- B. FOR PIPING 2-1/2" AND LARGER, MILWAUKEE M2242E BUTTERFLY VALVE, FULL LUG BODY, EPDM SEATS, STAINLESS STEEL DISC, LEVER OPERATOR.

**3.7 CROSS CONNECTIONS AND INTERCONNECTIONS**

A. NO INSTALLATION SHALL BE MADE OF PLUMBING FIXTURE, DEVICE OR PIPING THAT WILL PROVIDE A CROSS CONNECTION OR INTERCONNECTION BETWEEN A DISTRIBUTING WATER SUPPLY FOR DRINKING OR DOMESTIC PURPOSES AND A POLLUTED SUPPLY SUCH AS A DRAINAGE SYSTEM OR A SOIL OR WASTE PIPE THAT WILL PERMIT OR MAKE POSSIBLE A BACKFLOW OF SEWAGE, POLLUTED WATER OR WASTE INTO THE WATER SUPPLY SYSTEM.

**3.8 SOIL, WASTE, DRAIN AND VENT PIPING**

- A. UNDERGROUND SOIL, WASTE, DRAIN AND VENT PIPE AND FITTINGS, THROUGHOUT THE BUILDING BELOW THE BASE SLAB TO THE LOCATIONS NOTED OUTSIDE OF THE BUILDING,

3.16 PLUMBING FIXTURES

- A. ALL FIXTURES SHOWN OR SCHEDULED ON THE DRAWINGS SHALL BE FURNISHED AND INSTALLED...
B. ALL EXPOSED FITTINGS AND PIPING AT THE FIXTURES SHALL BE CHROME PLATED...
C. ALL CHINA FIXTURES SHALL BE NEW, OF THE BEST GRADE VITREOUS WARE...
D. PLUMBING FIXTURES SHALL BE AS SPECIFIED, OR EQUIVALENT PRODUCTS MANUFACTURED BY ELIJER, KOHLER, SLOAN, CRANE...

3.17 PAINTING (SEE ARCHITECTURAL SECTION "PAINTING")

- A. PAINTING, EXCEPT AS SPECIFIED HEREIN, SHALL BE DONE BY OTHERS.
B. EQUIPMENT WHICH HAS DAMAGED FINISH SHALL BE REPAINTED TO MATCH THE ORIGINAL FACTORY FINISH.
C. ALL EXPOSED FERROUS METAL FURNISHED UNDER THIS CONTRACT, SUCH AS HANGERS, STRUTS, STRUCTURAL STEEL, ETC. SHALL BE GIVEN ONE COAT OF TNEMEC GRAY PRIMER.

PART 4 - FIRE PROTECTION

4.1 GENERAL REQUIREMENTS

- A. SEE PART 1 FOR GENERAL REQUIREMENTS.

4.2 SUMMARY

- A. THIS SECTION INCLUDES PROVIDING A COMPLETE WET PIPE FIRE-SUPPRESSION SYSTEM INCLUDING SERVICE LINE FOR THE BUILDING.
B. THIS SECTION INCLUDES MODIFICATION AND EXTENSION OF THE EXISTING WET PIPE FIRE-SUPPRESSION SYSTEM INSIDE THE BUILDING.

4.3 SYSTEM DESCRIPTION

- A. FURNISH AND INSTALL A COMPLETE WET PIPE AUTOMATIC SPRINKLER SYSTEM FOR FIRE PROTECTION. ALL ELEMENTS AND COMPONENTS OF THE SYSTEM SHALL BE IN COMPLIANCE WITH NFPA PAMPHLET 13, "STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS"; AND ALL CODES AND STANDARDS REFERENCED.
B. NEW AUTOMATIC SPRINKLERS WILL BE ATTACHED TO OR EXTENDED FROM EXISTING PIPING CONTAINING WATER AND THAT IS CONNECTED TO WATER SUPPLY. THE SYSTEM MODIFICATIONS SHALL BE IN COMPLIANCE WITH NFPA PAMPHLET 13, "STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS"; AND ALL CODES AND STANDARDS REFERENCED.

4.4 PERFORMANCE REQUIREMENTS

- A. FIRE-SUPPRESSION SPRINKLER SYSTEM DESIGN FOR THE PROJECT AREA SHALL BE SUBMITTED TO AND APPROVED BY THE AUTHORITIES HAVING JURISDICTION.
B. FIRE PROTECTION SYSTEM SHALL BE DESIGNED UNDER THE FOLLOWING APPLICABLE STANDARDS:
1. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
2. INTERNATIONAL FIRE CODE AND ALL REFERENCED MATERIAL.
3. REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. REQUIREMENTS OF THE OWNER'S INSURING AGENCY.
C. SPRINKLER HEAD SPACING, PIPE SIZING AND FLOW CALCULATION SHALL BE HYDRAULICALLY CALCULATED IN ACCORDANCE WITH NFPA STANDARD 13. CALCULATIONS SHALL INCLUDE OUTSIDE AND INSIDE HOSE REQUIREMENTS.
1. MARGIN OF SAFETY FOR AVAILABLE WATER FLOW AND PRESSURE: 10 PERCENT IN EXCESS OF BASE REQUIREMENTS, INCLUDING LOSSES THROUGH WATER SERVICE PIPING, VALVES, AND BACKFLOW PREVENTERS.
2. SPRINKLER OCCUPANCY HAZARD CLASSIFICATIONS: AS INDICATED OR AS REQUIRED BY NFPA 13.
3. MINIMUM DENSITY FOR AUTOMATIC-SPRINKLER PIPING DESIGN: AS INDICATED OR AS REQUIRED BY NFPA 13.
4. MAXIMUM PROTECTION AREA PER SPRINKLER: AS INDICATED OR AS REQUIRED BY NFPA 13.
5. A HAZEN AND WILLIAMS COEFFICIENT "C" OF 120 SHALL BE USED FOR ALL ABOVE GRADE PIPING AND ANY EXISTING UNDERGROUND PIPING. A COEFFICIENT "C" OF 140 MAY BE USED FOR NEW UNDERGROUND SERVICE ENTRANCE PIPING.

4.5 SUBMITTALS

- A. INSTALLATION OF SPRINKLER SYSTEM PIPING SHALL NOT PROCEED UNTIL APPROVED SUBMITTALS ARE RECEIVED BY THE INSTALLER. SUBMITTALS SHALL INCLUDE THE FOLLOWING:
1. SPRINKLER PIPING SYSTEM LAYOUT DRAWINGS AND HYDRAULIC CALCULATIONS. ALL WORKING DRAWINGS SHALL BE PREPARED ACCORDING TO NFPA 13 AND BE STAMPED BY A CERTIFIED FIRE PROTECTION ENGINEER. THE SUBMITTALS SHALL HAVE BEEN APPROVED BY AUTHORITIES HAVING JURISDICTION, INCLUDING HYDRAULIC CALCULATIONS.
2. APPROVED SPRINKLER EQUIPMENT AND ACCESSORIES.

4.6 QUALITY ASSURANCE

- A. INSTALLER QUALIFICATIONS: INSTALLER'S RESPONSIBILITIES INCLUDE DESIGNING, FABRICATING, AND INSTALLING FIRE-SUPPRESSION SYSTEMS AND PROVIDING PROFESSIONAL ENGINEERING SERVICES NEEDED TO ASSUME ENGINEERING RESPONSIBILITY. CALCULATION SHALL BE BASED ON RESULTS OF FIRE-HYDRANT FLOW TEST.
1. ENGINEERING RESPONSIBILITY: PREPARATION OF WORKING PLANS, CALCULATIONS, AND FIELD TEST REPORTS BY A QUALIFIED PROFESSIONAL ENGINEER.
B. NFPA STANDARDS: FIRE-SUPPRESSION-SYSTEM EQUIPMENT, SPECIALTIES, ACCESSORIES, INSTALLATION, AND TESTING SHALL COMPLY WITH THE FOLLOWING:
1. NFPA 13, "INSTALLATION OF SPRINKLER SYSTEMS."

4.7 MANUFACTURERS

- A. THE FOLLOWING REQUIREMENTS APPLY TO PRODUCT SELECTION:
1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH PROJECT REQUIREMENTS, ALL PRODUCTS AND MATERIAL SHALL BE LISTED IN FM APPROVED GUIDE AND IN UL PUBLICATIONS FOR THE SERVICE.

4.8 FIRE PROTECTION WATER SERVICE

- A. WATER SERVICE PIPING FOR FIRE PROTECTION SHALL BE CLASS 150 DUCTILE IRON OR CEMENT LINED CAST IRON WITH DUCTILE IRON MECHANICAL JOINTS.
B. PROVIDE A DOUBLE CHECK DETECTOR TYPE BACKFLOW PREVENTER ASSEMBLY ON THE FIRE PROTECTION SERVICE LINE. BACKFLOW PREVENTERS FOR FIRE PROTECTION SERVICE SHALL BE FEBCO OR EQUIVALENT BEECO, CONBRACO, OR WATTS. DOUBLE "Y" CHECK TYPE THAT IS APPROVED. THE ASSEMBLY SHALL INCLUDE RANGE, FULL PORT SHUT-OFF VALVES AND FOUR FULL PORT BALL VALVE TEST COCKS. ASSEMBLY SHALL BE FACTORY ASSEMBLED AND BACKFLOW TESTED.
1. THE BACKFLOW PREVENTER SHALL BE INSTALLED IN A PRECAST CONCRETE PIT WITH MANHOLE COVER ACCESS AS DETAILED ON THE DRAWINGS. PIT SHALL BE OF ADEQUATE SIZE FOR PROPER SERVICE SPACE AROUND THE DEVICE.
2. BACKFLOW PREVENTER SHALL BE INSTALLED INSIDE THE BUILDING. INSTALL WITH PROPER SERVICE SPACE AROUND THE DEVICE.
C. PROVIDE A FIRE DEPARTMENT CONNECTION FOR THE FIRE PROTECTION SYSTEM.
1. FIRE DEPARTMENT CONNECTION SHALL BE A (FREESTANDING) (FLUSH) TYPE POLISHED (CHROME) (BRASS) FIRE DEPARTMENT CONNECTION WITH THE NUMBER AND TYPE OF CONNECTIONS AS REQUIRED BY THE LOCAL FIRE DEPARTMENT STANDARDS. INSTALLATION SHALL INCLUDE CHECK VALVE AND BALL DRIP ASSEMBLY, PIPE TO DRAIN OR DISCHARGE ONTO GRADE. CONNECTION SHALL BE LABELED "SPRINKLER".
D. ALL CONTROL VALVES IN THE SPRINKLER SYSTEM SHALL BE PROVIDED WITH SUPERVISORY SWITCHES. SWITCHES WILL ALARM WHEN A VALVE IS NOT IN ITS NORMAL OPERATING POSITION.
1. WIRING OF THE SWITCHES TO THE BUILDING FIRE ALARM SYSTEM AND ANNUNCIATOR PANEL TO GIVE AN AUDIBLE AND VISUAL ALARM IS SPECIFIED IN THE ELECTRICAL WORK UNLESS NOTED OTHERWISE.
2. PROVIDE A UL LISTED FIRE ALARM SYSTEM WITH DIAL-OUT FEATURE CAPABLE OF SERVING THE SPRINKLER SYSTEM ALARMS. SYSTEM INCLUDES ALL POWER, DEVICE/ZONE WIRING, ETC. FOR A COMPLETE TURNKEY SYSTEM.
E. PROVIDE WATER FLOW ALARM APPARATUS FOR THE SYSTEM. ALARM DEVICE SHALL BE A LISTED ALARM CHECK VALVE WITH ALL NECESSARY ATTACHMENTS REQUIRED TO GIVE AN ALARM. FLOW ALARM DEVICES SHALL BE INSTALLED PER NFPA REQUIREMENTS. ALSO PROVIDE FLOW SWITCHES AS INDICATED ON THE DRAWINGS AND AS REQUIRED BY NFPA.
1. WIRING FLOW ALARM AND TAMPER SWITCHES TO THE FIRE ALARM SYSTEM IS SPECIFIED IN THE ELECTRICAL WORK.
2. WIRING TO THE LOCAL FIRE ALARM SYSTEM IS UNDER THE FIRE PROTECTION WORK.

4.9 FIRE PROTECTION PIPE AND FITTINGS

- A. 2" AND SMALLER, THREADED-END, STANDARD-WEIGHT STEEL PIPE: ASTM A 53A 53M, ASTM A 135, OR ASTM A 795, WITH FACTORY-OR-FIELD-FORMED THREADED ENDS.
1. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3.
2. STEEL THREADED PIPE NIPPLES: ASTM A 753, MADE OF ASTM A 53A 53M OR ASTM A 106, SCHEDULE 40, SEAMLESS STEEL PIPE. INCLUDE ENDS MATCHING JOINING METHOD.
3. STEEL THREADED COUPLINGS: ASTM A 865.
B. 2-1/2" AND LARGER STANDARD WEIGHT STEEL PIPE: ASTM A 53A 53M, ASTM A 135, OR ASTM A 795, WITH WELDED OR ROLL-CUT GROOVE ENDS.
1. STANDARD WEIGHT WELDING FITTINGS OR STANDARD WEIGHT FITTINGS WITH GROOVED JOINTS.
C. HANGERS FOR FIRE PROTECTION PIPING SHALL BE AS FOLLOWS:
1. ANVIL FIGURE 69 GALVANIZED CARBON STEEL ADJUSTABLE SWIVEL RING HANGER: UL/FM.
D. HANGER AND SUPPORT SPACING SHALL BE AS FOLLOWS:
1. 8 FEET FOR PIPING 1" AND SMALLER.
2. 10 FEET FOR PIPING 1-1/4" THROUGH 3".
3. 12 FEET FOR PIPING 4" AND LARGER.

4.10 SPRINKLER HEADS

- A. SPRINKLER HEADS SHALL BE BY CENTRAL OR EQUIVALENT GRINNELL, STAR, VIKING OR RELIABLE. THE STYLES SHALL BE AS FOLLOWS:
1. AREAS WITH FINISHED CEILINGS: CENTRAL SPRINKLER MODEL "A", RECESSED AUTOMATIC SPRINKLER, POLISHED CHROME FINISH, ADJUSTABLE 2-PIECE ESCUTCHEON.
2. AREAS WITH FINISHED CEILINGS: CENTRAL SPRINKLER MODEL "76A", ADJUSTABLE FLUSH CONCEALED AUTOMATIC SPRINKLER, COVER PLATE WITH FLAT WHITE FINISH.
3. AREAS WITHOUT CEILINGS: CENTRAL SPRINKLER MODEL "A", PENDANT AUTOMATIC SPRINKLER, ROUGH BRONZE FINISH.
4. AREAS WITHOUT CEILINGS: CENTRAL SPRINKLER MODEL "A", UPRIGHT AUTOMATIC SPRINKLER, ROUGH BRONZE FINISH.
5. AREAS PROTECTED WITH SIDEWALL SPRINKLERS: CENTRAL SPRINKLER MODEL "H", HORIZONTAL SIDEWALL SPRINKLER, POLISHED CHROME FINISH.
B. SPRINKLER HEADS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION GUIDE.
C. SPRINKLER HEADS SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE CENTERS OF CEILING TILES WITHOUT THE USE OF SWING JOINTS.
D. SPRINKLER HEADS SHALL BE LOCATED IN THE CENTER OF CEILING TILES WITH A TOLERANCE OF +/- 2 INCHES. SPRINKLER HEADS SHALL BE INSTALLED WITH SWING JOINTS TO LOCATE HEADS.

4.11 PIPING INSTALLATION

- A. LOCATIONS AND ARRANGEMENTS: INSTALL PER NFPA 13 REQUIREMENTS AND AS INDICATED ON DRAWINGS.
B. HANGERS AND SUPPORTS: COMPLY WITH NFPA 13 FOR HANGER MATERIALS.
1. INSTALL SPRINKLER SYSTEM PIPING ACCORDING TO NFPA 13.

4.12 FIELD QUALITY CONTROL

- A. PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS:
1. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.
B. REPORT TEST RESULTS PROMPTLY AND IN WRITING TO ARCHITECT AND AUTHORITIES HAVING JURISDICTION.

PART 1 - GENERAL REQUIREMENTS - ELECTRICAL

1.1 SUMMARY OF WORK

- A. THE CONTRACT DOCUMENTS REQUIRE THE FURNISHING AND INSTALLING OF COMPLETE FUNCTIONING ELECTRICAL SYSTEMS, AND EACH ELEMENT THEREOF, AS SPECIFIED OR INDICATED IN THE CONTRACT DOCUMENTS OR REASONABLY INFERRED, TO COMPLETELY CONSTRUCT AND LEAVE READY FOR OPERATION THE SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREIN DESCRIBED, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY, WHETHER OR NOT SPECIFICALLY CALLED FOR BY ITEM, ELEMENTS OF THE WORK INCLUDE MATERIALS, LABOR, SUPERVISION, SUPPLIES, EQUIPMENT, TRANSPORTATION, AND UTILITIES.
B. SPECIFICATIONS AND DRAWINGS ARE COMPLEMENTARY AND WHAT IS CALLED FOR IN ONE SHALL BE AS BINDING AS IF CALLED FOR BY BOTH CONTRACTS AND ALL CODES AND STANDARDS REFERENCED.
C. ALL WORK PERFORMED UNDER THIS SECTION SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER BY EXPERIENCED MECHANICS OF THE PROPER TRADE.

1.2 COORDINATION, MEASUREMENTS AND LAYOUTS

- A. THE CONTRACTOR SHALL INSPECT THE SITE WHERE THIS WORK IS TO BE PERFORMED AND FULLY FAMILIARIZE HIMSELF WITH ALL CONDITIONS RELATED TO THIS PROJECT.
B. THE CONTRACTOR SHALL EMPLOY A COMPETENT FOREMAN ON THE JOB TO SEE THAT WORK IS DONE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND IN A SATISFACTORY AND WORKMANLIKE MANNER. THE FOREMAN SHALL KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND SHALL EXECUTE HIS WORK IN SUCH A MANNER AS NOT TO INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.
C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION, WHERE LOCAL CONDITIONS NECESSITATE A REARRANGEMENT. THE CONTRACTOR SHALL PREPARE, AND SUBMIT FOR APPROVAL, DRAWINGS OF THE PROPOSED REARRANGEMENT, BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL OF HIS WORK AND SHALL ARRANGE SUCH WORK ACCORDINGLY, FURNISHING SUCH OFFSETS, FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWINGS SHALL NOT BE SCALED TO DETERMINE DIMENSION.

1.3 PERMITS AND FEES

- A. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND LICENSES AND SHALL MAKE ALL DEPOSITS AND PAY ALL FEES REQUIRED FOR THE PERFORMANCE OF WORK UNDER THIS SECTION, OTHER THAN THOSE DEPOSITS OR FEES WHICH ARE FULLY REFUNDABLE TO THE OWNER.

1.4 SUBMITTALS, MATERIALS AND EQUIPMENT

- A. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE SPECIFIED HEREIN, FREE FROM DEFECTS AND OF THE BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE.
B. AS SOON AS POSSIBLE AFTER THE AWARD OF THE CONTRACT, THE CONTRACTOR SHALL SUBMIT FOR REVIEW SHOP DRAWINGS FOR ALL EQUIPMENT TO BE FURNISHED FOR THIS PROJECT. SUBMITTALS SHALL INCLUDE MANUFACTURER'S NAME, MODEL NUMBER, DESCRIPTIVE ENGINEERING DATA AND ALL NECESSARY INFORMATION AS TO FINISH MATERIAL, GAUGES AND ACCESSORIES. AFTER SUCH SHOP DRAWINGS ARE PROCESSED, AND REVIEWED, THEY WILL BE RETURNED TO THE CONTRACTOR WITH COMMENTS. THE CONTRACTOR SHALL, UPON RECEIPT OF REVIEWED SHOP DRAWINGS WITH ALL COMMENTS ADDRESSED, SHALL PROCEED WITH THE PROCUREMENT AND INSTALLATION OF SUCH EQUIPMENT.

1.5 CODES, LAWS, AND STANDARDS

- A. ALL WORK SHALL BE INSTALLED IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, THE NATIONAL BOARD OF FIRE UNDERWRITERS, THE NATIONAL ELECTRICAL SAFETY CODE, AND ALL GOVERNING CODES, APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES OR STATUTES OF REGULATORY BODIES HAVING JURISDICTION. THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH SAID LAWS, REGULATIONS, ORDINANCES, STATUTES OR CODES, WITHOUT INCREASED COST TO THE OWNER. ANY POINT IN QUESTION SHALL BE REFERRED TO THE ENGINEER FOR APPROVAL. WORK INDICATED ON THE DOCUMENTS THAT IS IN EXCESS OF CODE REQUIREMENTS SHALL NOT BE REDUCED IN QUALITY AND/OR QUANTITY.
B. COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMENTS AFFECTED BY CONNECTIONS OF SERVICES.

1.6 RECORD DOCUMENTS

- A. THIS CONTRACTOR SHALL PREPARE A COMPLETE "AS-BUILT" SET OF DRAWINGS INCORPORATING ALL CHANGES MADE DURING CONSTRUCTION. LOCATION OF UNDERGROUND CONDUIT SHALL BE LOCATED BY DIMENSION FROM COLUMN LINES.
B. THIS CONTRACTOR SHALL PREPARE AND SUBMIT OPERATING AND MAINTENANCE MANUALS TO THE OWNER'S REPRESENTATIVE, INCLUDING FINAL COPIES OF EQUIPMENT SHOP DRAWINGS, MANUFACTURER'S LITERATURE FOR ALL EQUIPMENT INSTALLED ON THE PROJECT SHOWING ALL DETAILS OF EQUIPMENT, REPLACEMENT PART DATA AND MAINTENANCE AND OPERATING INSTRUCTIONS. MANUALS SHALL INCLUDE COPIES OF ALL EQUIPMENT WARRANTIES.

1.7 GUARANTEES AND WARRANTIES

- A. THE CONTRACTOR SHALL GUARANTEE COMPLETE SYSTEM OPERATION AND THAT THE MATERIAL AND EQUIPMENT FURNISHED AND INSTALLED WILL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS AND WILL GIVE SATISFACTORY SERVICE UNDER THE SPECIFIED OPERATING CONDITIONS. THE CONTRACTOR AGREES TO REPLACE, WITHOUT EXPENSE TO THE OWNER, ANY PART OF THE APPARATUS WHICH PROVES OR BECOMES DEFECTIVE WITHIN ONE YEAR AFTER THE SYSTEM IS ACCEPTED. NO EQUIPMENT WARRANTY OR GUARANTEE SHALL START UNTIL THE TIME OF BUILDING ACCEPTANCE.
B. ALL WARRANTIES ISSUED BY EQUIPMENT MANUFACTURERS SHALL BE FILLED OUT IN THE OWNER'S NAME AND GIVEN TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF WORK PERFORMED UNDER THIS SECTION.

1.8 FINAL INSPECTION

- A. AFTER COMPLETION OF THE ENTIRE PROJECT THE CONTRACTOR SHALL REQUEST FINAL INSPECTION OF THIS PROJECT IN WRITING FROM ADDRESS TO THE ARCHITECT ALONG WITH A STATEMENT TO THE EFFECT THAT ALL INSTALLATIONS HAVE BEEN COMPLETED, CHECKED, ADJUSTED AND BALANCED IN ACCORDANCE WITH REQUIREMENTS OF THIS PROJECT. UPON RECEIPT OF WRITTEN NOTIFICATION OF COMPLETION AND REQUEST FOR FINAL INSPECTION THE ENGINEER WILL PERFORM A FINAL INSPECTION OF THIS WORK AND, IF ALL INSTALLATIONS ARE AS REPRESENTED BY THE CONTRACTOR, THE ENGINEER WILL SUBMIT WRITTEN RECOMMENDATION OF ACCEPTANCE.

1.9 CLEANING

- A. DIRT AND REFUSE RESULTING FROM THE PERFORMANCE OF THE WORK SHALL BE REMOVED TO KEEP THE PREMISES REASONABLY CLEAN AT ALL TIMES.
B. AFTER COMPLETION OF THE WORK DESCRIBED IN THIS SPECIFICATION AND SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED SURFACES AND EQUIPMENT, REMOVE ALL DIRT, DEBRIS, CRATING, CARTONS, ETC., AND LEAVE ALL INSTALLATIONS FINISHED AND READY FOR OPERATION.

1.10 OPENINGS AND SLEEVES

- A. ALL PIPING THROUGH EXTERIOR OR FOUNDATION WALLS SHALL PASS THROUGH SCHEDULE 40 GALVANIZED STEEL SLEEVES WHICH SHALL BE LARGE ENOUGH TO ALLOW FOR PIPE SEAL. SLEEVES IN NEW CONSTRUCTION SHALL HAVE A MINIMUM 2 INCH WATERSTOP IN THE CENTER OF THE SLEEVE. NO SLEEVES ARE PERMITTED THROUGH CONCRETE STRUCTURAL MEMBERS.
B. SPACE BETWEEN PIPE AND SLEEVE IN EXTERIOR UNDERGROUND WALLS SHALL BE SEALED WITH LINK-SEAL, FLEXICRAFT OR METRAFLEX LINK STYLE PIPE SEALS.
2. IN ABOVE GRADE EXTERIOR WALLS PACK THE SPACE BETWEEN PIPE AND SLEEVE WITH MINERAL WOOL AND THEN COMPLETE SEAL WITH APPROVED CAULKING COMPOUND FLUSH WITH FINISHED SURFACE. PROVIDE PIPE COLLAR ON INTERIOR SIDE OF WALL.
B. ALL PIPING THROUGH FLOORS SHALL BE PROVIDED WITH SCHEDULE 40 GALVANIZED STEEL PIPE SLEEVES, EXTENDING 1 INCH ABOVE THE FLOOR.
C. IN FIRE RATED WALLS: CAULKING SHALL BE A PURE CERAMIC FIBER MADE OF ALUMINA-SILICA, "CERAFIBER-FS" BY JOHNS-MANVILLE. SEALANT SHALL BE GUN GRADE, AN ACRYLIC 2-PART GUN APPLIED, FIRE RETARDANT ELASTIC SEALANT, "DYMERIC" BY TREMCO OR EQUAL BY BERGMATTE NO. 1119F.
1. LIMIT THE SIZE OF THE SPACE BETWEEN THE WALL OR FLOOR AND THE OUTSIDE OF THE PIPE OR DUCT TO 1 INCH MAXIMUM. THIS SPACE IS SUFFICIENT TO ALLOW SOME MOVEMENT OF THE PIPES OR DUCT WITHOUT CRACKING THE CAULKING OR SEALANT.
2. FOR OPENINGS IN WALLS, THE CAULKING SHALL BE APPLIED TO A MINIMUM OF 3 INCH TOTAL DEPTH. SEALANT SHALL THEN BE APPLIED ON BOTH SIDES OF THE WALL OPENING A MINIMUM OF 1/2 INCH IN DEPTH, FINISHED FLUSH WITH THE WALL. D. FOR OPENINGS IN FLOORS, THE CAULKING SHALL BE APPLIED FROM THE UPPER SIDE TO A MINIMUM OF 3 INCH TOTAL DEPTH RECESSED 1/2 INCH BELOW THE FINISHED FLOOR. THIS 1/2 INCH RECESS SHALL THEN BE FILLED WITH SEALANT TO FLUSH WITH FINISHED FLOOR.

1.11 CUTTING AND PATCHING

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING OF WALLS, FLOORS, CEILINGS AND ROOFS REQUIRED FOR PERFORMANCE OF HIS WORK.
B. NO STRUCTURAL MEMBER SHALL BE CUT WITHOUT PERMISSION FROM THE ARCHITECT.
C. PATCH ALL OPENINGS TO MATCH ADJACENT CONSTRUCTION IN BOTH MATERIAL AND FINISH.
D. ALL CUTTING OF EXISTING CONCRETE FLOORS/SLABS ON GRADE IN THE INTERIOR OF THE BUILDING SHALL BE PERFORMED BY "SAW CUTTING" AND SHALL BE PERFORMED BY THIS CONTRACTOR.

1.12 TEMPORARY HEAT

- A. THE CONTRACTOR SHALL COOPERATE WITH THE GENERAL CONTRACTOR TO PROVIDE TEMPORARY HEAT AS SOON AS POSSIBLE FOR USE DURING CONSTRUCTION IF TEMPORARY HEAT IS REQUIRED. AIR HANDLING EQUIPMENT SHALL NOT BE OPERATED AT ANY TIME WITHOUT FILTERS IN PLACE AND ALL EQUIPMENT SHALL BE PROTECTED FROM DAMAGE. OPERATING THE EQUIPMENT FOR TEMPORARY HEAT SHALL NOT START THE WARRANTY PERIOD OF THE EQUIPMENT USED.

1.13 DEMOLITION AND NEW WORK

- A. THE CONTRACTOR SHALL DO ALL DEMOLITION, ALTERATIONS AND REWORK INDICATED AND/OR REQUIRED TO MAINTAIN THE OPERATION OF ALL EXISTING ELECTRICAL SYSTEMS AND TO INTEGRATE THE NEW SYSTEMS IN THE RENOVATED BUILDING AS REQUIRED. THE CONTRACTOR SHALL INCLUDE ALL WORK WHICH MAY BE REQUIRED TO ALTERATIONS AND DEMOLITION WORK. THIS SHALL INCLUDE ALL REMOVAL, RELOCATION AND REWORKING OF WIRE AND CONDUIT, OUTLET BOXES, JUNCTION BOXES, ETC. EXISTING SYSTEMS AND NEW SYSTEMS SHALL BE COMPLETELY INTEGRATED AS INTENDED AND AS INDICATED ON THE PLANS AND IN THE SPECIFICATIONS.
B. THE CONTRACTOR SHALL REMOVE FROM THE PREMISES AND DISPOSE OF PROPERLY ALL EXISTING MATERIAL AND EQUIPMENT WHICH NO LONGER SERVES A PURPOSE IN ALTERED AREAS. THE CONTRACTOR SHALL REMOVE CONNECTIONS TO EQUIPMENT BACK TO PANEL OR JUNCTION BOX. MAINTAIN CIRCUIT CONNECTIVITY, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL MAINTAIN SERVICES TO ALL EXISTING AREAS REQUIRING SUCH SERVICES. THE CONTRACTOR SHALL REROUTES AS REQUIRED SUCH SERVICES WHERE ARE DISRUPTED DUE TO ARCHITECTURAL CHANGES IN THE EXISTING STRUCTURE. ANY EQUIPMENT WHICH IS DESIGNATED TO BE REUSED AND WHICH IS DAMAGED IN THE PROCESS SHALL BE REPLACED BY THE CONTRACTOR WITH NEW EQUIPMENT OF LIKE KIND AT NO COST TO THE OWNER.

1.14 INTERRUPTION OF SERVICES

- A. THE CONTRACTOR SHALL SCHEDULE ANY SERVICE INTERRUPTIONS TO THE EXISTING BUILDING WITH THE OWNERS REPRESENTATIVE. SUCH INTERRUPTIONS SHALL BE PLANNED SO AS TO BE AT TIMES TO CAUSE THE LEAST INCONVENIENCE AND INTERRUPTION TO THE FACILITY'S SCHEDULE.

1.15 EXISTING CONDITIONS

- ALL EXISTING CONDITIONS SHOWN ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS FOR THIS PROJECT HAVE BEEN DETERMINED FROM AVAILABLE DRAWINGS AND FIELD INVESTIGATIONS. CONTRACTORS MAKING PROPOSALS FOR THIS WORK SHALL INVESTIGATE ALL EXISTING CONDITIONS AND BASE THEIR PROPOSALS ON THEIR OBSERVATIONS TO PROVIDE COMPLETE AND FUNCTIONING INSTALLATIONS IN ACCORDANCE WITH THE INTENT OF THE DRAWING AND SPECIFICATIONS FOR THIS PROJECT AND ALL APPLICABLE GOVERNING CODES, RULES, REGULATIONS AND ORDINANCES. FAILURE TO DETERMINE EXISTING CONDITIONS WHICH CAUSE ADDITIONAL WORK WILL NOT CONSTITUTE GROUNDS FOR ADDITIONAL COMPENSATION.

PART 2 - ELECTRICAL

2.1 GENERAL REQUIREMENTS

- A. SEE PART 1 FOR GENERAL REQUIREMENTS.

2.2 IDENTIFICATION OF SWITCHES AND APPARATUS

- A. ALL CABINETS, SAFETY SWITCHES, AND OTHER APPARATUS USED FOR OPERATION AND CONTROL OF CIRCUITS, APPLIANCES, AND EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY IDENTIFIED BY MEANS OF ENGRAVED PLASTIC PLATES EITHER BLACK WITH WHITE LETTERS OR WHITE WITH BLACK LETTERS.

2.3 GROUNDING

- A. ALL CONDUCTORS, MOTOR FRAMES, RACEWAYS, CABINETS, ETC., THAT REQUIRE GROUNDING SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE, THOSE OF THE SERVING UTILITY AND LOCAL AUTHORITIES HAVING JURISDICTION.

2.4 SAFETY SWITCHES

- A. SAFETY SWITCHES, AS MANUFACTURED BY GENERAL ELECTRIC, GROUSE-HINDS, CUTLER-HAMMER, SQUARE D, SIEMENS, OR APPROVED EQUAL, SHALL BE FURNISHED AND INSTALLED (WHERE NOT FURNISHED BY OTHERS) WHEREVER SHOWN ON THE DRAWINGS SPECIFICALLY IDENTIFIED IN A SATISFACTORY AND WORKMANLIKE MANNER.
B. SAFETY SWITCHES SHALL BE HEAVY DUTY TYPE, UNDERWRITERS' LABORATORIES SHORT CIRCUIT LABELED FOR AT LEAST 10,000 AMPERES WITH CLASS R REJECTION FUSEHOLDERS SO AS TO COMPLY WITH NEC 100.9 SWITCHES INSIDE OF BUILDING SHALL BE FURNISHED IN NEMA 1 GENERAL PURPOSE ENCLOSURES. SWITCHES OUTSIDE OF BUILDING SHALL BE FURNISHED IN NEMA 3R ENCLOSURES UNLESS OTHERWISE SPECIFIED.
C. EACH MOTOR SHALL BE PROVIDED WITH A DISCONNECTING MEANS IN ACCORDANCE WITH REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

2.5 FUSES

- A. THIS CONTRACTOR SHALL FURNISH AND INSTALL CARTRIDGE AND PLUG TYPE FUSES AS MANUFACTURED BY THE BUSSMAN MANUFACTURING COMPANY, GOULDSHAMMUT, CEFCO, OR APPROVED EQUAL, IN ALL FUSIBLE EQUIPMENT. TIME-DELAY THERMO OR FUSETRON FUSES, SHALL BE INSTALLED ON ALL MOTOR CIRCUITS. NON TIME-DELAY AMP-TRAP (AZK OR AK) OR BUSSMAN LIMITRON (KTN OR KTS), UL CLASS RK1 SHALL BE INSTALLED ON CIRCUITS FEEDING PANELBOARDS. ALL OTHER CIRCUITS SHALL BE PROTECTED BY FAULT-TRAP, UL CLASS RK5, FUSES OR APPROVED EQUAL. CLASS K FUSES ARE NOT ACCEPTABLE.

2.6 CONDUIT

- A. ALL ELECTRICAL WIRING, INCLUDING LOW VOLTAGE WIRING, SHALL BE INSTALLED IN CONDUIT AS HEREIN SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 1/2" INCH NOMINAL SIZE SHALL BE USED BELOW GRADE. NO LESS THAN 1/2 INCH NOMINAL SIZE SHALL BE USED ABOVE GRADE.
B. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 EPC-40-PVC. ALL CONDUITS SHALL BE INSTALLED WITH MINIMUM 24 INCH COVER.
C. CONDUIT INSTALLED IN CONCRETE SLABS OR ABOVE GROUND SHALL BE GALVANIZED RIGID STEEL OR EPC-40-PVC.
D. WHEN PVC CONDUITS PENETRATE CONCRETE FLOOR CONSTRUCTION, CONTRACTOR SHALL USE RIGID STEEL OR IMC ELBOWS AND EXTENSION. PVC CONDUIT/FITTINGS SHALL NOT BE PERMITTED TO BE EXPOSED ABOVE THE FLOOR.
E. THINWALL TUBING SHALL BE E.M.T.
F. ALL FITTINGS SHALL BE OF THE COMPRESSION TYPE AND WATERTIGHT FOR UNDERGROUND AND IN SLAB LOCATIONS. COMPRESSION OR SCREWED FITTINGS FOR INDOOR.
G. CONDUIT FOR INTERIOR WIRING, IN GENERAL, SHALL BE THINWALL TUBING UNLESS OTHERWISE NOTED.
H. RACEWAYS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND FITTINGS TO FITTING. A RUN OF CONDUIT BETWEEN OUTLETS OR FITTINGS SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE OUTLET OR FITTING. THE RADIUS OF BENDS SHALL NEVER BE SHORTER THAN THAT OF THE CORRESPONDING RACEWAY. THE SYSTEM SHALL BE COMPLETE WITH OUTLETS, DISTRIBUTION BOXES, ETC., SMOOTH INSIDE AND MECHANICALLY SECURE IN PLACE. APPROVED STRAPS, HANGERS, OR SUPPORTS SHALL BE USED TO SECURE CONDUITS IN PLACE. CONDUITS SHALL, IN GENERAL, BE SUPPORTED AT INTERVALS NOT EXCEEDING 10'-0" AND WITHIN 3'-0" OF EACH OUTLET BOX, JUNCTION BOX, CABINET OR FITTING.
I. CONDUITS SHALL BE PROTECTED DURING CONSTRUCTION. PLUG AND KEEP CLEAN AND DRY. CONDUIT ENDS SHALL BE BUTTED IN CENTERS OF COUPLINGS. NO CRACKS OR FLATTENED SECTIONS WILL BE PERMITTED AT BENDS OR ELSEWHERE. ALL ENDS OF CONDUIT SHALL BE REAMED TO REMOVE ROUGH EDGES. RUNNING THREADS WILL NOT BE PERMITTED.
J. CONDUITS SHALL BE CONCEALED WITHIN THE WALLS, CEILINGS, AND FLOORS WHERE POSSIBLE AND UNLESS OTHERWISE NOTED. EXPOSED CONDUIT SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE BUILDING LINES.

2.7 WIRE AND CABLE

- A. WIRE AND CABLE SHALL BE COPPER.
B. ALL CONDUCTORS SHALL BE COPPER.
C. NO. 10 AWG AND SMALLER CONDUCTORS SHALL BE SOLID WITH TYPE THHN INSULATION AND NO. 8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED WITH TYPE THHN INSULATION EXCEPT THAT CONDUCTORS WITH 3 INCHES OF LIGHT FIXTURE BALLASTS SHALL HAVE RHH, THHN, OR EQUAL INSULATION RATED FOR 90 DEGREES C APPLICATION.

2.8 LOCATIONS OF OUTLETS AND EQUIPMENT

- A. ELECTRICAL OUTLETS AND EQUIPMENT ARE SO LOCATED ON THE DRAWINGS TO SHOW INTENT OF DESIGN. MINOR VARIATIONS IN THESE LOCATIONS MAY BE MADE BY THE CONTRACTOR TO COMPLY WITH STRUCTURAL AND OTHER REQUIREMENTS AS DETERMINED IN THE COURSE OF CONSTRUCTION. IT SHALL BE THE DUTY OF THIS CONTRACTOR TO TAKE HIS OWN MEASUREMENTS AND BE RESPONSIBLE FOR SAME. THIS CONTRACTOR SHALL ALSO REVIEW THE ARCHITECTURAL DRAWINGS AND THOSE DRAWINGS USED BY OTHER CONTRACTORS IN ORDER TO DETERMINE EXACT LOCATIONS FOR ELECTRICAL OUTLETS AND EQUIPMENT. DO NOT SCALE DRAWINGS FOR OUTLET LOCATIONS.

B. EQUIPMENT MOUNTING HEIGHTS:

- 1. INTERIOR RECEPTACLES:
(A) FLOOR TO BOTTOM: 16".
2. EXTERIOR RECEPTACLES:
(A) FLOOR TO CENTERLINE: 24".
3. TELECOMMUNICATION OUTLETS:
(A) FLOOR TO BOTTOM: 16".
4. SWITCHES:
(A) FLOOR TO TOP: 48".
5. RECEPTACLES ABOVE COUNTERS: CENTERLINE 10-INCHES ABOVE COUNTER AND HORIZONTAL.

2.9 WALL PLATES

- A. GROUPS OF SWITCHES, OUTLETS OR SWITCH AND OUTLET COMBINATIONS SHALL BE MOUNTED UNDER ONE GANG-PLATE.
B. WALL PLATES SHALL FIT AND COVER PROPERLY THE DEVICE AND WALL OPENING. NO OPEN OR UNFINISHED SURFACES SHALL SHOW AFTER INSTALLATION OF THE WALL PLATES.
C. WALL PLATES SHALL BE SET VERTICAL AND SHALL FINISH FLUSH WITH ALL SURROUNDING SURFACES.
D. WALL PLATES FOR ALL DEVICES AND TELECOMMUNICATION OUTLETS SHALL MATCH THE EXISTING DEVICES.

2.10 WIRING DEVICES

- A. SINGLE-POLE WALL TUMBLER SWITCHES FOR GENERAL USE, SHALL BE SPECIFICATION GRADE HUBBELL NO. 1121, OR APPROVED EQUAL, MECHANICALLY SILENT TYPE WITH PLASTIC HANDLES, RATED 20 AMPERES AC, 120/277 VOLTS. GENERAL USE SWITCHES INDICATED ON PLANS AS DOUBLE POLE, 3-WAY, 4-WAY OR LOCK TYPE WITH KEY GUIDE SHALL BE THE SAME SERIES AS THE SINGLE-POLE SWITCHES. DEVICE COLOR SHALL MATCH EXISTING.
B. CONVENIENCE OUTLETS IN FINISHED SPACES SHALL BE SPECIFICATION GRADE HUBBELL NO. 5362, OR APPROVED EQUAL, DUPLEX GROUNDING TYPE RECEPTACLES RATED 20 AMPERES AC, 120 VOLT. DEVICE COLOR SHALL MATCH EXISTING.
C. RECEPTACLES DESIGNATED WITH GROUND FAULT PROTECTION SHALL BE HUBBELL NO. GF-5362, OR APPROVED EQUAL, 120 VOLT, 20 AMP GROUND FAULT INTERRUPTER TYPE. DEVICE COLOR SHALL MATCH EXISTING.

2.11 TELECOMMUNICATIONS

- A. FURNISH AND INSTALL TELECOMMUNICATIONS OUTLETS AS NOTED ON THE DRAWINGS WITH 1 INCH CONDUIT TO ABOVE LAY-IN CEILINGS WITH END BUSHINGS.
B. PROVIDE PULL WIRES IN ALL TELECOMMUNICATION CONDUITS.
C. FURNISH AND INSTALL COVER PLATES SUITABLE FOR USE WITH THE EQUIPMENT TO BE CONNECTED.

2.12 LIGHTING FIXTURES

- A. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL LIGHTING FIXTURES AND LAMPS AS INDICATED ON THE DRAWINGS AND HEREIN DESCRIBED MATERIAL, EQUIPMENT, OR SERVICES NECESSARY TO COMPLETE THE INSTALLATION OF THESE FIXTURES, BUT NOT SPECIFICALLY MENTIONED, SHALL BE FURNISHED AS THOUGH SPECIFIED. ALL FIXTURES SHALL BE PROPERLY CLEANED AND ADJUSTED AFTER INSTALLATION.
B. ALL ADJUSTABLE LIGHTING FIXTURES SHALL BE CAREFULLY POSITIONED BY THIS CONTRACTOR IN THE PRESENCE OF THE ARCHITECT OR HIS REPRESENTATIVE.
C. DRIVERS SHALL BE AS NOTED IN THE FIXTURE SCHEDULE. DRIVERS IN FIXTURES DESIGNATED FOR EMERGENCY LIGHTING MUST BE COMPATIBLE WITH THE EMERGENCY UNIT USED.
D. THIS CONTRACTOR SHALL FURNISH AND INSTALL FIXTURES HEREIN SPECIFIED OR AS SHOWN ON THE DRAWINGS.
E. LIGHT FIXTURES SHALL BE SUPPORTED FROM STRUCTURE ABOVE PER UBC 47-18.
F. GENERAL CONTRACTOR SHALL PROVIDE ALL FIRE-RATED ENCLOSURES FOR LIGHT FIXTURES INSTALLED IN FIRE-RATED CEILINGS.

2.13 IDENTIFICATION OF EQUIPMENT

- A. ALL SERVICE ENTRANCE EQUIPMENT, DISCONNECT SWITCHES, PANELBOARDS, RELAYS, MOTOR STARTERS, CONTACTORS, TELEPHONE TERMINAL CABINETS, TV EQUIPMENT AND RISER JUNCTION BOXES, AND OTHER ELECTRICAL EQUIPMENT UNDER THIS CONTRACT, SHALL BE PROVIDED WITH PROPER IDENTIFICATION. IDENTIFICATION SHALL BE BY THE USE OF ENGRAVED COLOR CODED PLASTIC NAMEPLATES WITH WHITE LETTERING SCREWED TO THE COVER OF THE EQUIPMENT. USE OF EMBOSSED PLASTIC "TAPE" LABELS AS PREPARED BY "TYPEWRITER" TYPE EQUIPMENT SHALL NOT BE USED. COLOR CODING SHALL BE AS FOLLOWS:
1. EQUIPMENT CONNECTED TO A NORMAL POWER SOURCE SHALL BE BLACK WITH WHITE LETTERS.

2.14 FIRE ALARM SYSTEM

- A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT, WIRE, CONDUIT AND ENGINEERING SERVICES NECESSARY TO INSURE A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM AS DESCRIBED HEREIN AND AS SHOWN ON THE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL MATERIAL AND EQUIPMENT COMPATIBLE TO THE SYSTEM SUPPLIED. ANY EQUIPMENT NOT SPECIFICALLY MENTIONED IN THIS SPECIFICATION OR NOT SHOWN ON THE DRAWINGS BUT REQUIRED FOR THE PROPER OPERATION OF THE FIRE ALARM SYSTEM SHALL BE FURNISHED AND INSTALLED. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION, SUBMISSION, AND APPROVAL OF COMPLETE FIRE ALARM SHOP DRAWINGS SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER, AND FOR OBTAINING ALL REQUIRED PERMITS AND APPROVALS FROM THE AUTHORITY HAVING JURISDICTION (A.H.J.), ALL FEES ASSOCIATED WITH DESIGN, REVIEW, AND PERMITTING SHALL BE INCLUDED IN THE CONTRACTOR'S SCOPE OF WORK.
B. ALL EQUIPMENT AND COMPLETED INSTALLATION SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, NFPA, LOCAL CODES, THESE SPECIFICATIONS AND AUTHORITIES HAVING JURISDICTION WITH THE STRICTER REQUIREMENTS GOVERNING IN CASE OF POSSIBLE VARIANCES. ALL COMPONENTS OF THE SYSTEM SHALL BE STANDARD OF THE MANUFACTURER, LISTED BY UNDERWRITERS' LABORATORIES, INC. AND BEAR THEIR MARK.
C. THE FIRE ALARM EQUIPMENT SHALL BE THAT OF THE GE-EST COMPANY OR COMPARABLE SYSTEMS BY PYROTRONICS, NOTIFIER OR SIMPLEX. THE ALARM CONTRACTOR SHALL PROVIDE, AT THE REQUEST OF THE OWNER, MEANS BY WHICH THE SYSTEM CAN BE SERVICED, MAINTAINED AND MONITORED BY COMPETENT QUALIFIED INDIVIDUALS.
D. THE SYSTEM SHALL BE ADDRESSABLE, ELECTRICALLY SUPERVISED AND UTILIZE 2-WIRE, CLASS B CIRCUITS FOR ALL ALARM INITIATION ZONES AND SIGNAL CIRCUITS. THE SYSTEM SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FIRE ALARM CONTROL PANEL, MANUAL AND AUTOMATIC ALARM INITIATING DEVICES AND AUDIBLE/VISUAL ALARM INDICATING DEVICES. THE SYSTEM SHALL HAVE THE CAPABILITY OF BEING MONITORED VIA AN OUTSIDE PHONE LINE PROVIDED BY THE OWNER.
E. ACTUATION OF ANY MANUAL OR AUTOMATIC INITIATING DEVICE SHALL CAUSE THE FOLLOWING:
1. ALL AUDIBLE INDICATING DEVICES TO SOUND.
2. VISUAL INDICATING DEVICES TO FLASH.
F. FIRE ALARM AUDIBLE/VISUAL UNITS SHALL MATCH THE EXISTING FIRE ALARM SYSTEM DEVICES AND SHOULD BE FLUSH-MOUNTED COMBINATION HORN AND FLASHING LIGHT. HORN SHALL BE RED VIBRATING TYPE OPERATING AT 24VDC. THE FLASHING LIGHT









